# KNOWLEDGE, ATTITUDES AND PERCEPTIONS OF DENTISTRY PATIENTS AND THEIR RELATIVES ABOUT THE COVID-19 PANDEMIC

*Diş Hekimliği Hastaları ve Yakınlarının COVID-19 Salgını ile İlgili Bilgi, Tutum ve Algıları*

**Gözde Nur ERKAN[1]** (ID)**, Özkan ÖZGÜL[2]** (ID)**, Mustafa Ercüment ÖNDER[2]** (ID)

[1]Kırıkkale Üniversitesi, Diş Hekimliği Fakültesi, Ağız, Diş ve Çene Cerrahisi A.D., Anesteziyoloji ve Reanimasyon Uzmanı, KIRIKKALE, TÜRKİYE

[2]Kırıkkale Üniversitesi, Diş Hekimliği Fakültesi, Ağız, Diş ve Çene Cerrahisi A.D., KIRIKKALE, TÜRKİYE

| ABSTRACT | ÖZ |
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**Objective**: The purpose of this cross-sectional survey was to investigate the attitudes, perceptions, awareness, and knowledge of dental patients and their relatives through concrete questions about behavior and prediction patterns among the Coronavirus Disease 2019 (COVID-19) pandemic.

**Material and Methods:** The questionnaire was administered face-to-face to 292 patients and their relatives who applied to the dental hospital during the COVID-19 pandemic. The data were run through univariate and multivariable regression analyses. Survey variables include demographics, comorbidities, compliance with protective measures, prediction of disease severity in case of coronavirus infection, hospital admission behaviors, the presence of coronavirus infection in the relative and the severity of the disease experienced by the relative and the risk of transmission in dentistry interventions during the pandemic.

**Results**: Participants showed high compliance with the use of masks in the proper area (77.4%). Generally, women's attitudes, knowledge, and perception levels were higher than men during the pandemic. Participants in the elderly age group (55-85 years) and with comorbidities predicted that they would get more seriously ill in case of coronavirus infection, but their knowledge, awareness, attitudes, and perception levels were lower than younger age groups. It was revealed that the knowledge, attitudes, and perceptions of the participants with low education levels and existing comorbidities were lower in general than high educated and non-comorbid participants.

**Conclusion:** In order to ensure full compliance with the protective measures, awareness and informative campaigns should primarily aim to inform male, low educated, comorbid, and elderly individuals.

*Keywords*: *COVID-19, knowledge, perception, attitude, pandemic*

**Amaç**: Bu kesitsel anket çalışmasının amacı, diş hekimliği hastaları ve yakınlarının koronavirüs hastalığı-2019 (COVID-19) pandemisine yönelik davranış ve öngörüleri hakkında somut sorular aracılığıyla tutum, algı, farkındalık ve bilgi düzeylerini araştırmaktır.

**Gereç ve Yöntemler**: Anket, COVID-19 pandemisi sırasında diş hastanesine başvuran 292 hasta ve yakınlarına yüz yüze uygulanmıştır. Veriler tek değişkenli ve çok değişkenli regresyon analizleri ile değerlendirilmiştir. Anket değişkenleri arasında demografik özellikler, komorbiditeler, pandemi döneminde koruyucu önlemlere uyum, koronavirüs enfeksiyonu durumunda hastalık şiddeti öngörüsü, hastaneye başvuru davranışları, yakınında koronavirüs enfeksiyonu varlığı ve yakının yaşadığı hastalığın şiddeti ve diş hekimliği müdahalelerinde bulaş riski yer almaktadır.

**Bulgular**: Katılımcılar, doğru alanda maske kullanımına yüksek oranda uyum gösterdi (%77,4). Genel olarak pandemi döneminde kadınların tutum, bilgi ve algı düzeyleri erkeklerden daha yüksekti. İleri yaş (55-85 yaş) ve komorbiditesi olan katılımcılar, koronavirüs enfeksiyonu durumunda daha ciddi şekilde hastalanacaklarını öngördüler ancak bilgi, farkındalık, tutum ve algı düzeyleri genç yaş grubundan daha düşüktü. Eğitim düzeyi düşük ve ek hastalıkları olan katılımcıların genel olarak bilgi, tutum ve algılarının eğitim düzeyi yüksek ve komorbiditesi olmayanlardan daha düşük olduğu ortaya çıkmıştır.

**Sonuç**: Koruyucu önlemlere tam uyumu sağlamak ve farkındalık oluşturmak için bilgilendirici kampanyalar öncelikle erkek, düşük eğitimli, komorbid ve yaşlı bireyleri bilgilendirmeyi hedeflemelidir.

*Anahtar Kelimeler: COVID-19, bilgi, algı, tutum, pandemi*

# INTRODUCTION

After the Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV) and Middle East Respiratory Syndrome Coronavirus (MERS-CoV) epidemics, a coronavirus-related epidemic has occurred in the world for the third time in the last 20 years. The epidemic of novel coronavirus (2019-nCoV) causing acute respiratory syndrome in humans in Wuhan, China on 12 December 2019 spread all over the world in a short time and reached the size of a pandemic as of March 11, 2020 (1).

The Coronavirus Disease 2019 (COVID-19) is transmitted from person to person directly (through coughing, sneezing, etc.) and by contact through mucous membranes of the mouth, nose, and eyes (2). Medical specialties that require close contact with mucosal membranes during treatments and interventions are considered riskier about COVID-19 transmission. Anesthesiologists, dentists, ophthalmologists, otolaryngologists, as well as auxiliary personnel, are at high transmission risk during the pandemic. In addition, infection transmission risk from healthcare personnel to the patient is higher in these procedures. Especially in dental hospitals, it is very important to take additional protective measures to prevent transmission between patient and doctor and to raise awareness of patients and staff (3).

Compliance with protection measures in the community is the most important step necessary for effective management and cessation of the disease spread (4). For this purpose, in Turkey, many activities are carried out on social platforms, public areas, and satellite broadcasts to raise awareness of society. Since the beginning of the pandemic, guides and posters containing recommendations and information for society and relevant institutions have been published. Moreover, a coronavirus hotline serving 24/7 has been established by the health authority (5). In Turkey,

where protective measures and patient treatments are managed successfully and devotedly, despite the penal sanctions, it has been observed that social protection measures are not fully complied with and there are periodic increases in the number of cases (6).

In this present study, it was aimed to evaluate different behavior patterns of the patients and their relatives regarding protective measures during the pandemic by associating them with various parameters. The study data aim to reveal the viewpoint of patients and their relatives in dental treatments according to education level, age, gender, existing comorbidities, and witnessing the outcome of relatives who got COVID-19. Also, the compliance and participation rates in measures taken by the authority are investigated. With the results obtained, after the identification of groups in which adequate awareness or perception is not established, it was aimed that study results will be resources for informative campaigns, posters, and publications for these groups, in Turkey and all over the world.

# MATERIALS AND METHODS

The study was inducted after the ethics committee approval obtained from Kırıkkale University Ethics Committee of Non-Interventional Research (date: 26.11.2020, number 2020.09.06). Two hundred ninety-two patients aged 18-85 years and their volunteering relatives were included in the study between December 2020 and March 2021. A questionnaire containing target-oriented multiple-choice questions was prepared for volunteer participants. Participants were evaluated in 5 groups according to age (18-24, 25-34, 35-44, 45-54, 55-85 years), gender, educational status, comorbidities (diabetes, hypertension, coronary artery disease, asthma/bronchitis and chronic obstructive pulmonary disease), existing COVID-19 positive family members and relative's disease severity. The basic knowledge of participants about the pandemic

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was evaluated, and with the data obtained they were cross compared according to mask compliance, prediction of getting severely ill, applying to the hospital only in an emergency, knowledge about high transmission risk in dental interventions.

Statistically, the data obtained in the study were analyzed with the SPSS 21 package software. In addition to the frequency and percentage distributions of the data, the dependence between the variables was examined using Chi-Square analysis. The significance level was 0.05. It was stated that there was a significant relationship/dependency in the case of $p<0.05$, and there was no significant relationship/dependency in the case of $p>0.05$.

## RESULTS

The descriptive data of the participants are shown in Table 1. The questionnaire and the preference rate of answers are given in Table 2. When age groups are compared about mask compliance, 81.23% of the participants between the 18-44 ages stated that they wear masks in indoor and outdoor environments. In the 55-85 age group, this rate was significantly decreased (Table 3). Compliance with mask measures was found to be significantly higher ($p<0.003$) in women than in men (Table 4). The mask compliance rate of non-comorbid participants is observed to be significantly higher than patients with comorbid diseases ($p<0.009$) (Table 4). The compliance rate (84%) of those whose education level is university or master is higher than other education levels. The lowest rate in this regard is in the participants with primary school diplomas or below (56.7%) (Table 3). In the comparisons, there was no difference between the participants whose relatives were infected with coronavirus and those whose relatives were not infected ($p>0.05$) (Table 4). The severity of the disease in the relatives of the participants, who experienced COVID-19, did not create a positive or negative behavioral change about mask usage. However, it was observed that correct mask usage was the lowest in the participants who did not follow the outcome of infected relatives (Table 4).

**Table 1**: Descriptive data analysis of the participants

| Descriptive Data | | Number/% |
|---|---|---|
| Age (year) | 18-24 | 103/35.3 |
| | 25-34 | 71/24.3 |
| | 35-44 | 55/18.8 |
| | 45-54 | 36/12.3 |
| | 55-85 | 27/9.3 |
| Gender | Woman | 154/52.7 |
| | Man | 138/47.3 |
| Education | Illiterate | 5/1.7 |
| | Elementary school | 25/8.6 |
| | Secondary school | 53/18.2 |
| | High school | 109/37.3 |
| | University or master | 100/34.2 |
| Comorbidities | No | 205/70.1 |
| | Yes | 87/29.9 |

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**Table 2**: Questions included in the survey and the number and ratio of the answers given by the participants

| Questions | Options | Number/% |
|---|---|---|
| Q1-Have you had any relatives, neighbors infected with coronavirus during the pandemic? | Yes | 227/77.7 |
| | No | 65/22.3 |
| Q2-If you have any relative who has experienced the COVID-19, what was the result? | I did not ask for the result, I did not follow | 20/8.8 |
| | Healed without any complaints | 32/14.1 |
| | Healed with a mild illness | 122/53.7 |
| | Got seriously ill but recovered | 38/16.7 |
| | Got seriously ill and died | 15/6.6 |
| Q3-What do you think about how seriously you would get ill in case of coronavirus infecting you? | The virus will never infect me | 11/3.8 |
| | The virus can infect me, but in this case, it cannot make me ill. | 18/6.2 |
| | I would get mildly ill if the virus infected me | 97/33.2 |
| | I would get seriously ill if the virus infected me, but I'll get over it | 54/18.5 |
| | If the virus infected me, I would get seriously ill and may die | 21/7.2 |
| | If the virus infected me, I would definitely die | 1/0.3 |
| | I have no idea what will happen if the virus infects me | 90/30.8 |
| Q4-In which environments do you use the mask during the pandemic? | I don't use mask | 5/1.7 |
| | I only wear a mask when going to hospitals | 7/2.4 |
| | Outside of my house, I only wear a mask when entering closed environments | 46/15.8 |
| | I wear a mask in all indoor and outdoor environments outside my home | 226/77.4 |
| | I wear a mask all the time, including inside my house | 8/2.7 |
| Q5-What do you think about getting dental treatments during the epidemic? | I do not go to the hospital even in an emergency | 12/4.1 |
| | I only go to the hospital in an emergency | 173/59.2 |
| | I go to the hospital in non-urgent situations that bother me | 82/28.1 |
| | I go to the hospital in non-urgent situations even if I can delay | 18/6.2 |
| | No idea | 7/2.4 |
| Q6-How do you think the risk of coronavirus transmission to the dentist and anesthesiologist performing the dental treatments and surgeries is compared to the other surgeries? | The risk of contamination is lower in dental surgeries and treatments- the risk is the same in all surgeries | 10/3.4-132/45.2 |
| | The risk of transmission is higher in dental surgeries | 104/35.6 |
| | No idea | 46/15.8 |
| Q7-Which dental treatments do you delay during the pandemic? | Cleaning of tartar | 155/53.1 |
| | Wearing braces | 130/44.5 |
| | Teeth whitening | 155/53.1 |

As a result of the evaluation of participants' predictions about how seriously they would get ill if they were infected with coronavirus, according to age groups, the rate of prediction that "I would get seriously ill if I were infected" was statistically significantly higher in the 55-85 age (p<0.035). In the 18-24 age group, the rate of participants (53.4%) who think that they would overcome the disease easily or that they would never get the disease were statistically significantly higher (p<0.035) (Table 3). While, in women, the rate of predicting to get seriously ill in case of infection was statistically significantly lower than men, the rate of answering "I have no idea what will happen when I get infected with the coronavirus" was higher in women compared to men (39% in women, 21.7% in men) (p<0.015). In case of infection, men (48.6%) thought that they would not get sick and will defeat the disease at a higher rate than women (38.3%) (Table 4). It was demonstrated that the rate of predicting that they would get seriously ill in case of infection is statistically significantly higher in comorbid participants than non-comorbid participants (p<0.0001) (Table 4). No significant difference was observed between the education level groups in this subject (Table 3). Although it was not statistically significant, the rate of predicting that they would get seriously ill in case of infection is higher in participants whose relatives had COVID-19 (Table 4). It was demonstrated that the rate of predicting that they would be seriously ill in case of infection is higher in participants whose relatives got seriously ill (Table 4).

**Table 3**: Knowledge, awareness, and perception levels according to age groups and educational status

| | Age Groups n/% | | | | |
|---|---|---|---|---|---|
| | 18-24 | 25-34 | 35-44 | 45-54 | 55-85 |
| Mask Compliance | 84/81.6 | 57/80.3 | 45/81.8 | 26/72.2 | 14/51.9 |
| Prediction of getting severely ill | 22/21.3 | 19/26.8 | 12/21.8 | 10/27.8 | 13/48.1 |
| Applying to hospital only in emergency | 55/53.4 | 45/63.4 | 33/60.0 | 24/67.7 | 16/59.3 |
| Knowledge about high transmission risk in dental interventions | 45/43.7 | 24/33.8 | 14/25.5 | 11/30.6 | 10/37 |

| | Education Status n/% | | | |
|---|---|---|---|---|
| | Elementary School and Illiterate | Secondary School | High School | University or master |
| Mask Compliance | 17/56.7 | 37/69.8 | 88/80.7 | 84/84.0 |
| Prediction of getting severely ill | 9/30.0 | 16/30.2 | 27/24.8 | 24/24 |
| Applying to hospital only in emergency | 16/53.3 | 37/69.8 | 56/51.4 | 64/64.0 |
| Knowledge about high transmission risk in dental interventions | 7/23.3 | 15/28.3 | 37/33.9 | 45/45.0 |

**Table 4**: Knowledge, awareness, and perception levels according to gender, comorbidity and relatives who experienced COVID-19 and the severity of COVID-19 that was experienced by relatives

| | Gender | | Comorbidity | | Covid-19 + relative[1] | |
| | n/% | | n/% | | n/% | |
| | Woman | Man | Yes | No | Yes | No |
|---|---|---|---|---|---|---|
| Mask Compliance | 131/85.1 | 95/68.8 | 43/64.2 | 183/81.3 | 175/77.1 | 51/78.5 |
| Prediction of getting severely ill | 35/22.7 | 41/29.7 | 34/50.7 | 42/18.6 | 63/27.7 | 13/20 |
| Applying to hospital only in emergency | 96/62.3 | 77/55.8 | 34/50.7 | 139/61.8 | 137/60.4 | 36/55.4 |
| Knowledge about high transmission risk in dental interventions | 58/37.7 | 46/33.3 | 17/25.4 | 87/38.7 | 81/35.7 | 23/35.4 |

| | Severity of Covid-19 that Experienced by Relatives n/% | | | | |
| | Severe illness and death | Severe illness and recovery | Mild illness | Recovery without illness | No follow[2] |
|---|---|---|---|---|---|
| Mask Compliance | 11/73.3 | 33/86.8 | 97/79.5 | 23/71.9 | 11/55 |
| Prediction of getting severely ill | 8/53.3 | 15/39.5 | 32/26.2 | 4/12.5 | 4/20 |
| Applying to hospital only in emergency | 9/60 | 21/55.3 | 76/62.3 | 22/68.8 | 9/45 |
| Knowledge about high transmission risk in dental interventions | 6/40 | 14/36.8 | 47/38.5 | 9/28.1 | 5/25 |

[1]: the relative that experienced COVID-19, [2]: did not follow the result

Although there was no statistically significant difference regarding the application to the hospital only in case of an emergency related to their dental treatments during the pandemic, it was found that the awareness levels of the 18-24 and 55-85 age groups were lower than 25-54 age groups (Table 3). The awareness on this subject was statistically and significantly higher in women (p<0.013) (Table 4). Although it was not statistically significant, the awareness level on getting only emergency dental treatment is observed to be lower in comorbid participants (Table 4). High awareness level on the same issue was observed in the participants at secondary school and university or higher education levels (69.8% and 64%, respectively) (Table 3).

Although not statistically significant, consciousness was found to be higher in those who had a relative infected with coronavirus (p<0.495) (Table 4).

It was shown that the knowledge of the 18-24 age group is the highest about the high COVID-19 transmission risk to the anesthesiologist and dentist during dental interventions. It was observed that the knowledge gradually decreases as age increases (Table 3). It was found that women and comorbid participants have significantly higher knowledge on this subject (p<0.038) (Table 4). University and master graduates gave the highest rate of correct answers compared to other education levels about the same subject (Table 3). In terms of knowledge, there was no difference

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between participants whose relatives are infected or not (p>0.05) (Table 4). However, the knowledge of the participants whose COVID-19 positive relatives recovered without any symptoms and did not follow the result, about the high risk of transmission to the dentist and anesthesiologist was lower (Table 4).

During the pandemic, witnessing COVID-19 positive relative did not affect knowledge about getting only emergency dental treatments and the high transmission risk during dental treatments (Table 4).

## DISCUSSION

In this study, it was aimed to evaluate the awareness and perception of patients and their relatives who applied to our hospital for dental treatment, on COVID-19, to determine the effect of awareness-raising activities carried out during the pandemic with the results to be obtained and to contribute to increasing compliance rate of patients via the measures.

A face-to-face questionnaire was applied to 292 people. Although there is no face-to-face similar study in the literature, online surveys were generally conducted in the survey studies performed for public health during the pandemic period, thus reaching a higher number of participants (7-11). The present study aimed to increase the accuracy and reliability of the data by adopting a face-to-face survey method with the participants. Since curfew was applied to citizens aged 65 and over at the time of the study, the low number of elderly patients, who applied to our hospital, limited the number of these participants. The majority of participants were high school and university graduates.

Since airborne transmission of COVID-19 infection is considered the main route of transmission, especially in dentistry, barrier protection equipment, including goggles, masks, gloves, caps, face shields, and protective outerwear, is highly recommended for all healthcare settings (3). There were quite different rates ranging from 41.2% to 73.6% for mask use in different studies (12-14). The majority of participants (77.4%) in our study adapted to mask use in the proper area. Although a high proportion of older age groups (45-85 years) predicted that they would get seriously ill in case of infection, mask compliance was lower than younger groups. This result might be due to the lower education level of elderly individuals and the higher respiratory distress during mask use than younger people. In the study conducted in US society, similar to our study, it was reported that mask compliance was higher in young people (9). However, there are also studies reporting that compliance of elderly individuals with preventive measures was higher (15,16). It was concluded that more comprehensive studies are needed to elucidate this behavior.

It was found that women adapt better to protective behaviors such as mask use than men, which is consistent with many studies (12-14). Similar to our study, it was demonstrated in different studies that the rate of mask compliance increased correlated with the increase in education level (15,16). It would be beneficial to include individuals with low education levels in the target audience in awareness campaigns about the importance of mask measures. Contrary to expectations, it was observed that comorbid participants had lower compliance with the use of masks in the proper area. A recently published meta-analysis revealed that more than a third of COVID-19 patients had underlying comorbidities such as cardiovascular disease (14.4%), hypertension (18.6%), and diabetes (11.9%) (17). It was thought that the fact that comorbid participants were generally in older age groups might have been effective in this result. It was considered that informative activities are necessary for elderly individuals whose mask compliance was lower despite higher existing comorbidities. It was found that witnessing the COVID-19 positive relative had no effect on the mask usage in proper areas. Likewise, the severity of COVID-19 in relatives of the participants did not create a behavioral change in this subject.

It was observed that most of the participants predicted that they would get mildly ill in case of being infected or have no opinion about this. In this regard, while participants between 18-44 ages predicted that they would not be infected with coronavirus/ they would not get ill in case of infection and that they would have a mild illness, a statistically significant opposite perception was found in 55-85 age group. In written and visual media, especially in uncontrolled social media, there is a misconception that COVID-19 is not serious in young people. Contrary to misconception obtained from these sources, it is clearly reported that disease causes serious illness and even death in young people, according to reliable scientific data from national and international sources (5,7,8). According to another study, men and young people were less committed to preventive behaviors; they might therefore increase the risk of contracting coronavirus and transmitting it to other people (18). Also, the prediction that men would not get ill or get mildly ill in case of infection was higher than women in our study. This prediction might be effective in lowering mask compliance in men. This way of thinking and behavior might be one of the reasons behind the fact that the COVID-19 mortality rate is almost 1.5-2 times higher in men in Turkey (6). Education level had no effect on the prediction of the disease severity in case of coronavirus infection. It was considered that the information obtained by the society from various news and sources about comorbid people getting more seriously ill were effective in the assumptions that comorbid participants would get more seriously ill in case of infection than non-comorbid people. Also, the prediction of getting seriously ill was higher in participants whose relatives died due to COVID-19.

Although most of the participants reported that they would only go to the hospital in an emergency during the pandemic, it was evaluated that almost half of the participants could not clearly separate emergency and non-emergency situations. Moreover, when the rates of having no information and applying to the hospital in non-emergency situations were evaluated together, it was clear that a significant part of participants had no information about the subject (40.8%). There was no statistical difference between age groups about this subject. Women adopted more conscious and correct behavior than men in emergency dental treatments as well as in mask compliance. In studies conducted in different societies, similar to our result, it has been reported that women's knowledge level and rate of exhibiting appropriate behavior were higher (7,9,10). There was no correlation between awareness and education level about applying to the hospital only in an emergency. It was observed that non-comorbid participants' knowledge about getting only emergency dental treatments during the pandemic period was higher. On the same subject, witnessing the COVID-19 positive relative has no effect on the knowledge.

It was demonstrated that knowledge and awareness in the society about the high risk of coronavirus transmission in terms of anesthesiologists and dentists were not adequate, and the majority of participants had no information or had an incorrect idea. Although young participants (18-24 years) had the highest knowledge level about high transmission risk in dental interventions, less than half of this group had the correct information. This result might be due to the fact that young individuals attach more importance to their dental health and have more information about dentistry. In a similar study conducted on pediatric patients' parents, the highest knowledge level about the high transmission risk in dentistry has been reported between 40-49 ages (19). The majority of participants, regardless of gender, are unaware of the high COVID-19 transmission risk in dentistry. As expected, it was shown that knowledge level about the high transmission risk in dentistry was correlated to the education level. Consistent with the results of studies revealing the rate of exhibiting behaviors compatible with science increases as the education level increases

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in general, it was observed in the present study that the education level significantly affects compliance with the use of masks (19,20). Similarly, in Turkish society, the direct ratio between awareness and education level was revealed about the application of only emergency treatments and the high transmission risk in dentistry. It was observed that non-comorbid participants had a higher knowledge level about this subject. This result might be due to the fact that comorbid participants are generally elder individuals. Regarding the same subject, witnessing a COVID-19 positive relative had no effect on knowledge. However, it was observed that the knowledge of the participants whose COVID-19 positive relatives recovered asymptomatically and who did not follow the outcome, was lower about the high transmission risk in dentistry. There might be a potential misperception that participants whose relatives have had the Covid-19 infection asymptomatically would not get sick even if they were infected with coronavirus, and also the participants who do not follow the disease process of their relative might not be in search of information; these subjects are thought to have contributed to this result.

Consequently, it was observed that there was a high awareness level in the society about mask usage in the proper area. Interestingly, it was demonstrated that the participants, who could not predict how seriously they would get ill in case of infection, acted more nervously in risky situations, adopted more correct behaviors in many subjects, and had a higher knowledge level. A high proportion of comorbid participants predicted that they would get seriously ill in case of coronavirus infection. However, the rate of mask compliance, contrary to expectations, was found to be lower than non-comorbid participants.

As a result, it would be beneficial to include primarily male, elderly, comorbid, and low-educated individuals in the target audience in the education and awareness campaigns to be organized.

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