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# Knowledge, attitudes, and practices of orthopedic patients towards COVID-19 outbreak

## Ortopedi hastalarının COVID-19 salgınına yönelik bilgi, tutum ve uygulamaları

**İbrahim Deniz Canbeyli [1], Meriç Çırpar [1], Caner Baysan [2], Fatma Hayvacı Canbeyli [3], Ali Tepe [1]**

**[1] Kirikkale University, School of Medicine, Department of Orthopedics and Traumatology, Kirikkale, Turkey**
**[2] Ankara University, School of Medicine, Department of Public Health / Epidemiology, Ankara, Turkey**
**[3] Kirikkale University, School of Medicine, Department of Pediatric Cardiology, Kirikkale, Turkey**

**ORCID ID of the author(s)**
**İDC: 0000-0003-3880-4779**
**MÇ: 0000-0001-9669-6513**
**CB: 0000-0002-7675-1391**
**FHC: 0000-0003-0619-075X**
**AT: 0000-0002-3030-959X**

Corresponding author/Sorumlu yazar:
İbrahim Deniz Canbeyli
Address/Adres: Kırıkkale Üniversitesi Yenişehir Kampüsü, Yahşihan, Kırıkkale, Türkiye
E-mail: denizcanbeyli@kku.edu.tr

Ethics Committee Approval: The study was approved by Kirikkale University Ethics Committee (Date: 5/20/2020, No. 2020.04.08) and performed in the Department of Orthopedics and Traumatology at Kirikkale University School of Medicine. All procedures in this study involving human participants were performed in accordance with the 1964 Helsinki Declaration and its later amendments.
Etik Kurul Onayı: Çalışma Kırıkkale Üniversitesi Etik Kurulu tarafından onaylanmış (Tarih: 20.05.2020, No. 2020.04.08) Kırıkkale Üniversitesi Tıp Fakültesi Ortopedi ve Travmatoloji Anabilim Dalı'nda gerçekleştirilmiştir. İnsan katılımcıların katıldığı çalışmalardaki tüm prosedürler, 1964 Helsinki Deklarasyonu ve daha sonra yapılan değişiklikler uyarınca gerçekleştirilmiştir.

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**Abstract**

Aim: Public education and awareness levels play a prominent role in effective, timely prevention and control of a public health crisis. We aimed to determine the level and defective sides of knowledge, perceptions, and awareness of the population who were referred to the outpatient clinic of the Orthopedics and Traumatology on pandemic days.

Methods: In this prospective cross-sectional study, a total of 467 patients who were referred to the orthopedics outpatient clinic between May 21, 2020 and June 21, 2020 were surveyed. We used the questionnaire which was previously described by Khan et al. A total of 276 volunteer patients aged over 16 years were included. Patients' knowledge, perceptions, and awareness level regarding COVID-19 were evaluated in terms of spread of the COVID-19 pandemic, prevention, and control policies.

Results: Out of these respondents, 58.3% were males and 41.7% were females. Around 50% of patients were aged less than 45 years, while 50% were above 45 years. The majority of the participants (question-5 [n=271; 98.2%], question-6 [n=231; 83.7%], question-7 [n=221; 80.1%]) had knowledge about the name, origin, signs and symptoms of COVID-19 infection, although their knowledge about the spread of coronavirus was relatively low. 225 participants (81.5%) did not receive any form of training or orientation about infection prevention and control. The mean age those who preferred newspapers and advertisements, friends and family, and other sources (51.09 (17.63) years) was higher than those who preferred social media and the internet (37.85 (16.45) years) ($P$<0.001).

Conclusion: There is a lack of information about spread routes, hence, protection from COVID-19 in the society. We suggest that health care providers develop, and release content-checked health education programs that aim to increase the knowledge level among the people and control COVID-19 spread.

**Keywords:** COVID-19, Knowledge, Attitudes, Practice, SARS-CoV-2, Coronavirus

**Öz**

Amaç: Halkın eğitimi ve farkındalık seviyeleri, bir halk sağlığı krizinin etkili, zamanında önlenmesi ve kontrolünde önemli bir rol oynar. Biz pandemi günlerinde Ortopedi ve Travmatoloji polikliniğine başvuran insanların bilgi, algı ve farkındalık düzeylerini ve kusurlu taraflarını belirlemeyi amaçladık.

Yöntemler: Bu prospektif kesitsel çalışmada, 21 Mayıs 2020 ile 21 Haziran 2020 tarihleri arasında ortopedi polikliniğine başvuran toplam 467 hasta incelendi. Çalışmada Khan ve arkadaşlarının tanımladığı anket kullanılmıştır. Çalışmaya 16 yaş üstü toplam 276 gönüllü hasta dahil edildi. Hastaların COVID-19 hakkındaki bilgi, algı ve farkındalık düzeyleri COVID-19 pandemisinin yayılma, önleme ve kontrol politikalarına göre değerlendirildi.

Bulgular: Katılımcıların %58,3'ü erkek, %41,7'si kadındı. Hastaların toplam %50'si 45 yaş altındayken, %50'si 45 yaş üzerindeydi. Katılımcıların çoğunluğunun koronavirüsün yayılmasına ilişkin bilgi düzeyleri nispeten düşük olmasına rağmen (soru-5 [n=271; %98,2], soru-6 [n=231;% 83,7], soru-7 [n=221; %80,1]) isim, köken, COVID-19 enfeksiyonunun belirti ve semptomları hakkında yeterli bilgi sahibi idi. 225 katılımcı (%81,5) enfeksiyon önleme ve kontrol konusunda herhangi bir eğitim veya yönlendirme almamıştı. Bilgiye erişimde gazete, reklam, arkadaş, aile ve diğer kaynakları tercih edenlerin yaş ortalaması (51,09 (17,63) yıl), sosyal medya ve interneti tercih edenlerden (37,85 (16,45) yıl) daha yüksekti ($P$<0.001).

Sonuç: Toplumda yayılma yolları ve dolayısıyla COVID-19'dan korunma hakkında bilgi eksikliği vardır. Sağlık hizmeti sağlayıcılarının, insanlar arasında bilgi düzeyini ve dolayısıyla COVID-19'un yayılmasını kontrol altına almayı amaçlayan içerik kontrollü sağlık eğitimi programları geliştirmelerini ve yayınlamalarını öneriyoruz.

**Anahtar kelimeler:** COVID-19, Bilgi, Tutumlar, Uygulama, SARS-CoV-2, Koronavirüs

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## Introduction

The novel coronavirus disease-2019 (COVID-19, also known as severe acute respiratory syndrome coronavirus 2 [SARS-CoV-2]) was first reported as unknown cases of systemic acute respiratory syndrome from Wuhan, Hubei, mainland China on December 8th, 2019 [1-4]. COVID-19, which is thought to have spread from a seafood market in Wuhan, was declared a pandemic by the World Health Organization (WHO) after having been reported in more than 100 countries on March 11th, 2020 [5].

Turkey was threatened by the COVID-19 pandemic, like the rest of the world. Strict measures were taken to prevent this pandemic, so it did not lead to a national health crisis. The Republic of Turkey, Ministry of Health declared a guideline for infection control, which was based on science board recommendations, after the first case was seen on March 11th, 2020. According to this guideline, only emergency patients, patients with severe comorbid disease, oncological diseases, and those in the postoperative follow-up period were able to present to the outpatient clinics to prevent transmission of the coronavirus among patients with comorbid diseases [6]. Moreover, patients who presented to the hospital were checked in terms of signs and symptoms of COVID-19. Thus, the number of patients who were referred to the outpatient clinics decreased. However, the orthopedic outpatient clinic was the most crowded one in those days, especially due to the high population of elderly patients with degenerative musculoskeletal diseases and those in the postoperative follow-up period. In addition, the pediatric patient population also raised as the schools were closed and the children became more active in daily life.

The implementation of basic infection control protocols is only possible when individuals are aware of public health policies. Public education and awareness levels play a prominent role in effective, timely prevention and control of a public health crisis. In addition, the assessment of knowledge and perceptions of populations about rapidly spreading infectious disease outbreaks, such as COVID-19, should be accomplished in a brief period to provide information to public health institutions.

In the present study, we aimed to determine the level and defective sides of knowledge, perceptions, and awareness of the population who visited the Orthopedics and Traumatology outpatient clinic regarding COVID-19, and provide data to guide health care providers and hospital managers in informing the patients about COVID-19 and probable future pandemics.

## Materials and methods

This study was approved by the Kırıkkale University Ethics Committee (Date: 5/20/2020, No. 2020.04.08). A written informed consent was obtained from each patient. The study was conducted in accordance with the principles of the Declaration of Helsinki.

In this prospective cross-sectional study, a total of 467 patients who visited the orthopedics outpatient clinic between May 21, 2020 and June 21, 2020 were surveyed. A total of 276 volunteers aged over 16 years were included. The sample size was calculated with the formula which was previously used by Zhong et al. [7] as follows: Sample size= (Zα2 * (P) * (1-P)) / C2. Z value for 99% confidence interval =2.576, P=0.900, C=0.05). It was determined that at least 239 individuals had to be recruited to the study for 99% confidence interval, 5% margin of error, and 90.0% prevalence. Patients under 16 years of age and those who did not volunteer to participate were excluded. Patients' knowledge, perceptions, and awareness levels on COVID-19 were evaluated in terms of COVID-19 spread, prevention, and control policies. We used the questionnaire which was previously described by Khan et al. [8]. The questionnaire was translated into Turkish by the authors (Table 1). It includes demographic features and 21 different questions to measure patients' basic knowledge of infection, their attitudes, standard practices during the infection outbreak, control programs and policies, awareness of origin, transmission, and signs and symptoms.

Table 1: Questionnaire on COVID-19

Questionnaire-based analysis of infection prevention and control in Turkey regarding Coronavirus
* Required

| | |
|---|---|
| Q1 | Age * |
| Q2 | Gender *<br>• Male<br>• Female<br>• Other…. |
| Q3 | Profession * |
| Q4 | Organization *<br>• Government Hospital<br>• Private Hospital<br>• Educational Institutes |
| Q5 | Do you know the name of Coronavirus? *<br>• Yes<br>• No<br>• Maybe |
| Q6 | Do you know the origin of Coronavirus? *<br>• Yes • No • Maybe |
| Q7 | Are you aware of common signs and symptoms of Coronavirus? *<br>• Yes • No • Maybe |
| Q8 | Does having fever, flue, and cough mean that you are infected? *<br>• Yes • No • Maybe |
| Q9 | Can you get Coronavirus from a parcel coming from china? *<br>• Yes • No • Maybe |
| Q10 | Can you get it from pets? *<br>• Yes • No • Maybe |
| Q11 | Do you have knowledge of other pandemic viral infections in the past? *<br>• Yes • No • Maybe |
| Q12 | Can we stop the viral spread in Turkey? *<br>• Yes • No • Maybe |
| Q13 | Is there an infection control program in the hospital you are applying for? *<br>• Yes • No • Maybe |
| Q14 | Does your country have any infection control policies and guidelines? *<br>• Yes • No • Maybe |
| Q15 | Have you received some form of training or orientation about infection prevention and control? *<br>• Yes • No • Maybe |
| Q16 | Does your organization have an emerging infectious disease task force (dealing with outbreaks)? *<br>• Yes • No • Maybe |
| Q17 | Do you think that all residents in your city are promptly following infection control policies and rules? *<br>• Yes • No • Maybe |
| Q18 | Do you think your country is prepared for any infection outbreak? *<br>• Yes • No • Maybe |
| Q19 | Is Coronavirus curable? *<br>• Yes • No • Maybe |
| Q20 | Do you think that going to school, hospital or any organization is safe? *<br>• Yes • No • Maybe |
| Q21 | Where can you get further information about Coronavirus? *<br>• Internet<br>• Social media<br>• Newspapers and advertisements<br>• Friends and family<br>• Others …….. |

Q: Question

### Statistical analysis

Statistical analysis was performed with the Statistical Package for the Social Sciences (SPSS) for Windows version 25.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were presented in mean (standard deviation (SD)), median (min-max), or number and frequency. The variables were examined using visual (histogram and probability plots) and analytical methods (Shapiro-Wilk test) to determine whether they were normally distributed. The Kruskal-Wallis test was conducted to compare the non-normally distributed parameters and three and more independent variables. The chi-square automatic interaction detector (CHAID) analysis was performed to identify

the factors affecting the variables of "age" and "sources" (friends and family, internet, newspapers and advertisements, social media, or Others). The CHAID analysis is one of the decision tree methods dividing the selected variable (main node) into subgroups according to their importance by categories. If the main selected variable is continuous, it is divided into groups by F tests. If it is a categorical variable, it is divided into groups by the chi-square test. It was decided to divide into subgroups according to the *P*-value (≤0.05) using the Bonferroni correction. The decision tree included the following criteria: The number of maximum levels was 3, the number of decision nodes was 25, the number of terminal nodes was 10, and *P*≤0.05. A *P*-value of <0.05 was considered statistically significant.

## Results

### Characteristics of participants

Out of these respondents, 58.3% were males and 41.7% were females. A total of 50% patients were aged less than 45 years, while 50% were above 45 years. Most of the participants (n=49) were workers. Details of demographic characteristics are summarized in Table 2.

### Knowledge assessment of participants

The majority of the participants (question-5 [n=271; 98.2%], question-6 [n=231; 83.7%], question-7 [n=221; 80.1%]) had knowledge about the name, origin, signs and symptoms of COVID-19 infection, although their knowledge about the transmission of coronavirus was relatively low. 225 participants (81.5%) did not receive any form of training or orientation about infection prevention and control. Of the 276 participants, 211 (76,4%) believed that policies regarding infection prevention, control, and guidelines were implemented in our hospital and 196 thought that they were implemented in Turkey (71%). In addition, 178 participants (64.5%) believed that Turkey was ready for a pandemic, while 61 (22.1%) were indecisive. Distribution of responses to the questions is presented in Table 3.

Table 2: Sociodemographic characteristics of participants

| | n (%) |
|---|---|
| Gender | |
| Female | 115 (41.7) |
| Male | 161 (58.3) |
| Age | |
| Mean (SD) | 45.63 (18.33) |
| Median (Min-Max) | 45.5 (7-90) |
| Occupation | |
| Academician | 1 (0.4) |
| Civil servant | 29 (10.5) |
| Coach | 3 (1.1) |
| Engineer | 1 (0.4) |
| Farmer | 3 (1.1) |
| Health care worker | 7 (2.5) |
| Homemaker | 73 (26.4) |
| Police Officer | 1 (0.4) |
| Retired | 44 (15.9) |
| Soldier | 3 (1.1) |
| Student | 35 (12.7) |
| Teacher | 3 (1.1) |
| Tradesman | 24 (8.6) |
| Worker | 49 (17.8) |

Table 3: Distribution of responses by age

| | Age | | | |
|---|---|---|---|---|
| | n (%) | Mean (SD) | Median (Min-Max) | *P*-value |
| Q5 | | | | |
| Yes | 271(98.2) | 45.19 (18.14) | 45(16-86) | |
| No | 3(1.1) | 76 (13.11) | 74(64-90) | 0.023* |
| Maybe | 2(0.7) | 59 (1.41) | 59(58-60) | |
| Q6 | | | | |
| Yes | 231(83.7) | 44.24 (18.03) | 43(16-86) | 0.020* |
| No | 40(14.5) | 53.18 (17.93) | 50(16-90) | |
| Maybe | 5(1.8) | 49.2 (23.69) | 45(21-81) | |
| Q7 | | | | |
| Yes | 221(80.1) | 44.07 (18.32) | 43(16-86) | 0.014* |
| No | 17(6.2) | 55.24 (20.19) | 54(16-90) | |
| Maybe | 38(13.8) | 50.39 (15.64) | 51(16-72) | |
| Q8 | | | | |
| Yes | 141(51.1) | 44.56 (17.25) | 46(16-85) | 0.569 |
| No | 54(19.6) | 46.13 (22.21) | 45(16-86) | |
| Maybe | 81(29.3) | 47.15 (17.49 | 45(16-90) | |
| Q9 | | | | |
| Yes | 162(58.7) | 45.33 (18.91) | 47(16-85) | |
| No | 47(17) | 44.38 (17.73) | 39(18-86) | 0.617 |
| Maybe | 67(24.3) | 47.21 (17.47) | 47(16-90) | |
| Q10 | | | | |
| Yes | 131(47.5) | 46.86 (18.83) | 47(16-85) | |
| No | 92(33.3) | 43.35 (19.3) | 39.5(16-90) | 0.210 |
| Maybe | 53(19.2) | 46.53 (15.00) | 46(16-74) | |
| Q11 | | | | |
| Yes | 131(47.5) | 44.52 (19.13) | 44(16-86) | 0.267 |
| No | 112(40.6) | 47.77 (17.86) | 47(16-90) | |
| Maybe | 33(12) | 42.76 (16.29) | 39(16-78) | |
| Q12 | | | | |
| Yes | 211(76.4) | 45.91 (18.51) | 46(16-90) | 0.828 |
| No | 14(5.1) | 46.64 (19.92) | 48(16-78) | |
| Maybe | 51(18.5) | 44.18 (17.42) | 43(16-77) | |
| Q13 | | | | |
| Yes | 211(76.4) | 45.19 (18.76) | 44(16-90) | 0.374 |
| No | 12(4.3) | 41.83 (18.98) | 38(16-78) | |
| Maybe | 53(19.2) | 48.23 (16.4) | 49(16-78) | |
| Q14 | | | | |
| Yes | 196(71) | 44.92 (17.96) | 43(16-86) | 0.246 |
| No | 29(10.5) | 51.31 (21.63) | 57(16-90) | |
| Maybe | 51(18.5) | 45.12 (17.52) | 47(16-81) | |
| Q15 | | | | |
| Yes | 42(15.2) | 41.81 (18.49) | 37(16-75) | |
| No | 225(81.5) | 46.31 (18.14) | 47(16-90) | 0.331 |
| Maybe | 9(3.3) | 46.44 (22.19) | 46(16-78) | |
| Q16 | | | | |
| Yes | 211(76.4) | 46.02 (18.26) | 46(16-90) | |
| No | 33(12) | 46.52 (19.31) | 48(20-80) | 0.574 |
| Maybe | 32(11.6) | 42.09 (17.95) | 43.5(16-81) | |
| Q17 | | | | |
| Yes | 111(40.2) | 46.77 (19.06) | 47(16-86) | 0.402 |
| No | 119(43.1) | 44.18 (17.74) | 42(16-90) | |
| Maybe | 46(16.7) | 46.61 (18.18) | 47.5(16-78) | |
| Q18 | | | | |
| Yes | 178(64.5) | 45.94 (18.91) | 47(16-86) | 0.785 |
| No | 37(13.4) | 46.57 (19.77) | 46(16-90) | |
| Maybe | 61(22.1) | 44.15 (15.73) | 43(16-78) | |
| Q19 | | | | |
| Yes | 129(46.7) | 44.39 (19.18) | 42(16-85) | 0.223 |
| No | 37(13.4) | 43.65 (18.02) | 40(16-78) | |
| Maybe | 110(39.9) | 47.75 (17.35) | 48.5(16-90) | |
| Q20 | | | | |
| Yes | 87(31.5) | 48.06 (17.91) | 48(16-86) | 0.177 |
| No | 159(57.6) | 43.91 (18.34) | 43(16-90) | |
| Maybe | 30(10.9) | 47.7 (19.08) | 51(16-78) | |

Q: Question, * There is a significant difference in Q5, 6 and 7 between yes and no answers

### Age and source-based awareness

Social media (n=77) was the most preferred source of information about the COVID-19 outbreak. Details of distribution of sources are shown in Figure 1. In the CHAID analysis of source, the participants who were over 45 years of age preferred friends and family, while those who were less than 45 years of age preferred social media as the source of knowledge about COVID-19 (*P*<0.001). A significantly higher number of participants under 45 years old who had knowledge about past viral pandemic infections (Question 3) used the others as a source of information (*P*=0.020). We found that the majority of the participants who were under 45 years who responded the 'Do you have knowledge of other pandemic viral infections in the past?' (Question 11) as 'No' or 'Maybe' and believed that COVID-19 was curable used social media as the source of information (*P*=0.016). On the other hand, a

significantly higher number of participants who were aware of the previous viral outbreaks and considered that all cough and fever symptoms were related to COVID-19 infection (Question 8) used social media as the source ($P$=0.023). Details of CHAID analysis of source are shown in Figure 2.

The mean age those who preferred newspapers and advertisements, friends and family, and other sources (51.09 (17.63) years) was higher than those who preferred social media and the internet (37.85 (16.45) years) ($P$<0.001). The mean age of those who did not know the name of coronavirus (76 (13.11) years) was significantly higher than those who knew its name (45.19 (18.14) years; $P$=0.023). Moreover, the mean age of those who did not know the origin of coronavirus (Question 6) (53.18 (17.93) years) was significantly higher than those who did (44.24 (18.03) years; $P$=0.020). The mean age of those who recognized the common signs and symptoms of COVID-19 (44.07 (18.32) years) was significantly less than those who did not know (55.24 (20.19) years; $P$=0.014). However, there was no significant difference between the mean ages of those who knew or did not know the common signs and symptoms of COVID-19 ($P$=0.569). There was no significant difference in terms of mean age between those who answered "Yes", "No" or "Maybe" to other questions. Details of distribution of age-based responses are summarized in Table 3. In CHAID analysis, the mean age of those who use social media and internet as a source of information about COVID-19 was significantly less than those who used the newspapers and advertisements, friends and family, and others ($P$<0.001). A significantly higher number (n=131) of those who used the newspapers and advertisements, friends and family, and others as sources had knowledge about the origin of COVID-19 ($P$=0.007). Among these 131 individuals, the mean age of women (52.40 (18.33) years) who knew the origin of COVID-19 was significantly higher than that of men (45.67 (16.38) years) ($P$=0.029). Details of CHAID analysis of age are shown in Figure 3.

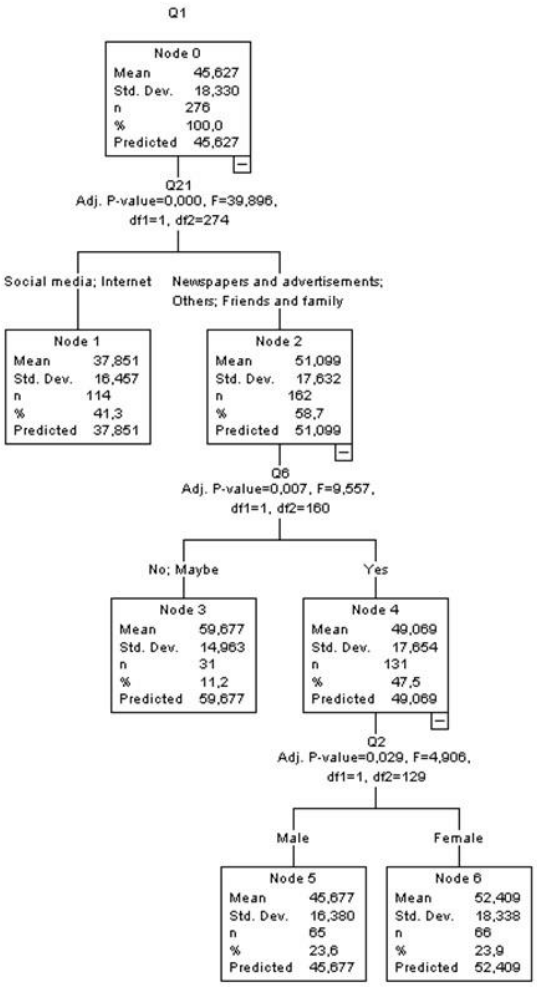


Figure 3: Aged-based decision tree of CHAID analysis

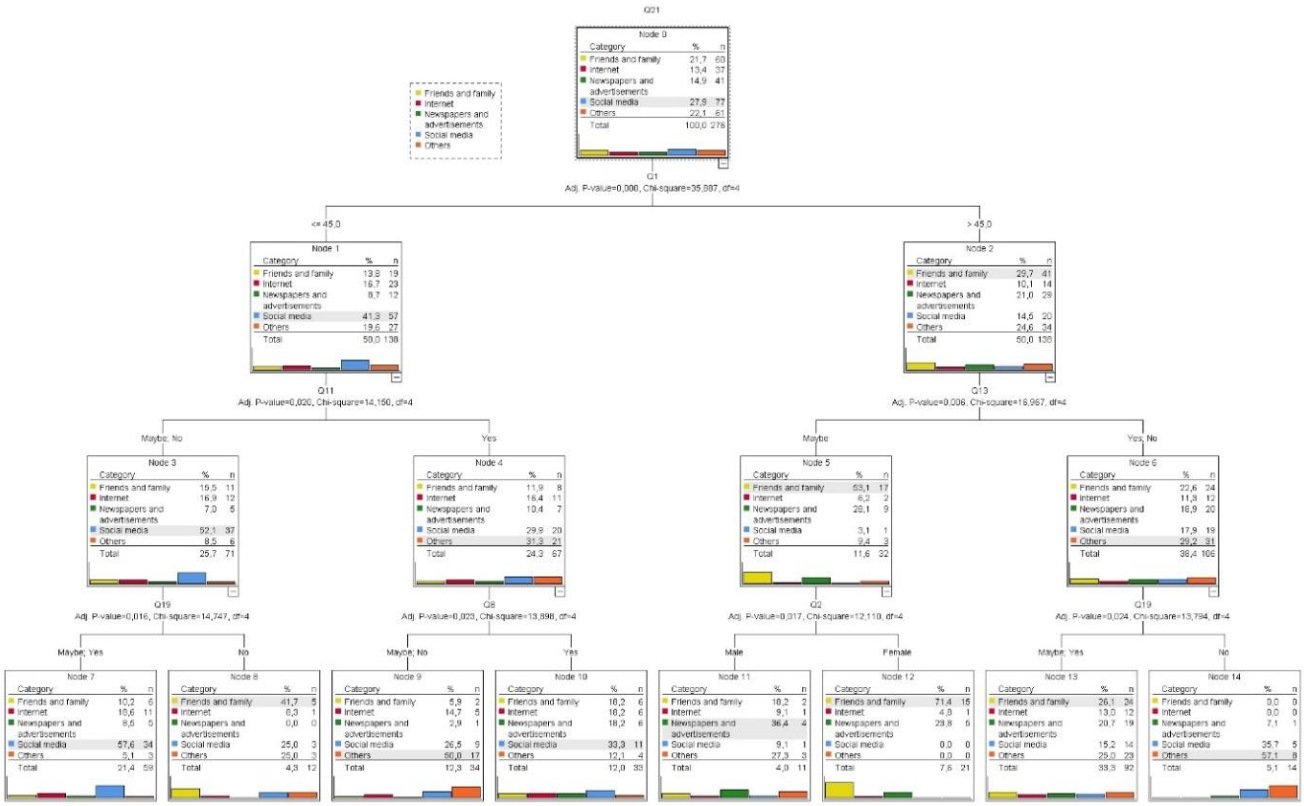


Figure 2: Source-based decision tree of CHAID analysis

## Discussion

Turkey is one of the largest countries between the Middle East and Europe with more than 80 million citizens. To the best of our knowledge, this is the first study in the Turkish population examining the knowledge, attitudes, and practices toward COVID-19 among patients.

The implementation of basic infection control protocols is possible when individuals are aware of public health policies. Moreover, public education and awareness levels play a vital role in timely prevention and control of a public health crisis such as COVID-19. The most attractive finding of our study was the lack of knowledge of the participants about the spread of coronavirus. It was well documented by WHO [9] that the disease spreads primarily from human to human through small droplets from the nose or mouth, which are expelled when a person with COVID-19 coughs, sneezes, or speaks. People can catch COVID-19 if they breathe in these droplets from a person infected with the virus. It is important to stay at least 1 meter away from others. These droplets can land on objects and surfaces around the person such as tables, doorknobs, and handrails [9]. People can become infected by touching these objects or surfaces, then touching their eyes, nose, or mouth. Thus, it was highly recommended to wash your hands regularly with soap and water or clean with alcohol-based hand rubs. The lack of information about the transmission routes of coronavirus may play a significant role in the spread of COVID-19. People may misbehave with regards to individual protection from COVID-19. Incorrect usage of the masks and gloves, insufficient handwashing, and application errors of social distance in business life and in the specific events to our country, such as weddings and enlistment ceremonies, increase the transmission of the virus around substantial number of citizens. Thus, the effectiveness of common public education programs plays the key role for protection in epidemics.

Our study also revealed that, 81.5% of the participants did not receive any form of training or orientation about infection prevention and control. Zhong et al. [7] stated that health education programs aimed at improving COVID-19 knowledge are helpful for maintaining safe practices. In another study, Abdelhafiz et al. [10] reported that vaccine development is estimated to require months, and thus management of the COVID-19 outbreak depends primarily on people's knowledge, attitudes, and practices. Practicing hand and respiratory hygiene is important at outbreaks such as SARS and COVID-19 and is the best way to protect oneself. It was also underlined by WHO that since some infected individuals may be asymptomatic or their symptoms may be mild, maintaining at least a 1-meter distance with everyone is needed if you are in an area where COVID-19 is circulating, and particularly important when you are standing by someone who is coughing or sneezing [9]. Therefore, we believe that in preventing the spread of epidemic diseases, the public education programs must include detailed data about transmission routes of the agent, protection methods and public and individual protection policies.

In the current study, patients had a vast knowledge of name, origin, signs, and symptoms of COVID-19, and optimistic attitudes toward SARS-CoV-2. In a pandemic, people should not be pessimistic, however, ignorant optimism may lead to inadequate implementation of protective measures, which can lead to an out-of-control increase of infected individuals. Even if the ideal training program is implemented, indifference due to optimism can cause a deficiency in the purpose of education programs.

In our study, social media and internet were the most preferred sources of information, instead of more traditional media platforms; namely, newspapers and advertisements for patients under 45 years of age, while friends and family were the most popular sources for patients over 45 years of age. A concern in this regard is the spread of dis- and misinformation about COVID-19 on social media. WHO Director General Tedros Adhanom Ghebreyesus stated that a global epidemic of misinformation spreading rapidly through social media platforms and other outlets pose a severe problem for public health [11]. Since social media can include unverified information, it may be a source of false information. We believe that in such a public health crisis, both the ministry of health and non-governmental health organizations should work together to reveal the most accurate information and deliver it to all parts of the population using all informing platforms such as the social media, visual, and printed media, while keeping content under control.

### Limitations

The main limitation of the present study includes the methodological limitations of the survey. There may be some reporting bias. Data were self-reported and data from non-respondents could not be obtained. In addition, the questionnaire was not pilot tested, which would have increased its reliability. Finally, this study included only those living in a single city; thus, further large-scale, and multi-center studies are needed.

### Conclusion

There is a lack of information about spread routes and hence protection from COVID-19 in the society due to the limited ways of accurately informing large populations. Therefore, the content-checked health education programs such as printed brochures and advertisements, public information videos on TVs and social media that aim to increase knowledge level among the people and control the spread of COVID-19 should be developed and released in cooperation with the ministry of health and non-governmental health organizations.

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