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# Covid-19 ; Pediatric and Patient Relationship: Evaluation of Knowledge, Attitudes and Behaviors of Pediatricians in Turkey

## *Covid-19; Pediatrist ve Hasta İlişkisi: Türkiye'deki Pediatristlerin Bilgi, Tutum ve Davranışlarının Değerlendirilmesi*

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**Abstract**

**Objective:** Aim of this study is evaluate the knowledge, attitudes and behaviors related to Covid-19 among physicians who are experts in child health and diseases in Turkey.

**Material and Method:** In this study with a cross-sectional prospective design, a 20-question survey about Covid-19 was created using an online program. A total of 324 child health and disease experts were included in the study. There were two questions about the disease scored as 4 and 5 points, respectively. The factors affecting a high score were determined by the logistic regression analysis.

**Results:** Study designed when the Covid-19 first broke out. Physicians, 43.8% considered that they had either low or moderate knowledge about the subject. Physicians' anxiety about being infected was over 95%. The mean score of the physicians in the two disease-related questions was 4.42±2.3. High scores were obtained from respondents over 35 years old [OR: 2.069 (CI: 1.224-3.497)], those with chronic diseases [OR: 2.105 (CI: 1.042-4.25)], those that followed the official websites of health authorities [OR: 5.40 (CI: 2.616) -11.148], and those that attended informative meetings at their workplace [OR: 2.25 (CI: 1.434-3.540].

**Conclusions:** According to the results of our study, it was observed that in the early days of the Covid-19 pandemic, pediatricians did not have enough knowledge about the subject, and at the point of raising awareness of Covid-19; we are of the opinion that ensuring the participation of physicians in informative meetings and holding meetings about methods of coping with anxiety will be beneficial for physicians who will treat the disease.

**Key Words:** Anxiety; Covid-19; pediatrician.

**Özet**

**Amaç:** Çalışmanın amacı Türkiye'de çocuk sağlığı ve hastalıkları konusunda uzman hekimlerin Covid-19 ile ilgili bilgi, tutum ve davranışlarını değerlendirmektir.

**Gereç ve Yöntem:** Kesitsel prospektif tasarımlı bu çalışmada, çevrimiçi bir program kullanılarak Covid-19 hakkında 20 soruluk bir anket oluşturuldu. Çalışmaya toplam 324 çocuk sağlığı ve hastalıkları uzmanı dahil edildi. Hastalığa ilişkin sırasıyla 4 ve 5 puan olarak puanlanan iki soru vardı. Yüksek puanı etkileyen faktörler lojistik regresyon analizi ile belirlendi.

**Bulgular:** Çalışmamız Covid-19 salgınının ilk ortaya çıktığı dönemde tasarlanan bir çalışmadır. Çalışmamızdaki sonuçlara göre; pediatrist hekimlerin %43.8'i konu hakkında düşük veya orta düzeyde bilgiye sahip olduğunu düşünmektedir ve yine hekimlerin enfekte olma kaygısı %95'in üzerinde bulunmuştur. Hekimlerin hastalıkla ilgili iki sorudan aldıkları puan ortalaması 4,42±2,3'tür. 35 yaş üstü [OR: 2.069 (CI: 1.224-3.497)], kronik hastalığı olanlar [OR: 2.105 (CI: 1.042-4.25)], sağlık otoritelerinin resmi web sitelerini takip edenlerin [OR: 2.105 (CI: 1.042-4.25)], 5.40 (CI: 2.616) -11.148] ve işyerinde bilgilendirme toplantılarına katılanların [OR: 2.25 (CI: 1.434-3.540]) Covid-19 hakkındaki sorulardan daha yüksek puanlar aldığı gözlemlendi.

**Sonuç:** Çalışmamız sonuçlarına göre Covid-19 pandemisinin ilk zamanlarında pediatristlerin konu hakkında yeterli bilgiye sahip olmadığı gözlemlenmiş ve Covid-19 farkındalığının arttırılması noktasında; hekimlerin bilgilendirici toplantılara katılımının sağlanmasının ve hekimlere anksiyete ile başa çıkma yöntemleri ile ilgili toplantıların yapılmasının hastalığı tedavi edecek olan hekimlere de faydalı olacağı görüşündeyiz.

**Anahtar Kelimeler:** Anksiyete; Covid-19; podiatrist.

## Introduction

A new-generation coronavirus type, Covid-19 was detected in the city of China in Wuhan in December 2019. First named the virus; new coronavirus (2019 nCoV) and secondly referred to as severe acute respiratory distress syndrome coronavirus-2 (SARS-Cov-2), its final name was Covid-19 and this virus caused the pandemic by spreading out from China, to all over the world (1). The World Health Organization defined the global risk to virus 'very high' in February 28 2020 (2). Although information about the disease is very new and limited, it is seen that it affects children much less than the elderly population,

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and the mortality rate among the pediatric cases is low (3,4). At the same time, studies emphasize that children are asymptomatic carriers and it is not yet known what effect of the virus will have on their adult lives; therefore, children should be closely monitored for years (5). Moreover, investigating why this age group is less affected is very important for setting new treatment goals for the disease (5,6). In this context, determining the knowledge, awareness, attitudes and behaviors of child health and disease experts in relation to Covid-19 is important considering that the inevitable contact of pediatric patients with their pediatricians, as well as their primary caregiver (mother, father, or others) constitute a significant risk factor. This study was conducted with child health and diseases experts in Turkey to elicit their level of knowledge, attitudes and behaviors related to Covid-19.

## Materials and Methods

A new questionnaire about Covid-19 was developed for the current study. Firstly, we carried out a literature search in Turkish and English and screened available guidelines using the following keywords: "Covid-19", "coronavirus", "children", and "pediatrics". Then, a questionnaire consisting of 20 questions was compiled from the relevant sources. Google forms were used to create the questionnaire. The study had a cross-sectional and prospective design, and the 20-question survey was administered online to physicians working actively in health institutions in Turkey. The pediatricians whose mobile phone numbers could be obtained were contacted by phone while others were emailed or contacted through social media to take part in the online survey. Due to the pandemic, face-to-face interviews were not undertaken. The participants completed the online survey on a voluntary basis.

**Power analysis:** According to the data of the National Association of Public Hospitals, there were approximately 1000 pediatric physicians in private institutions and 2,506 pediatric physicians actively working in healthcare institutions and organizations affiliated with the Ministry of Health in Turkey. The number of people required for the sample was calculated using the formula, $n = N.t2p.q / (d2.(N-1)+t2.p.Q)$ (7). In this formula, N refers to the number of people in the study population (3506), n indicates the number of people to be sampled, p represents the frequency of people seen in an event in society (unknown prevalence: 50%), q (1-p) refers to frequency of not being seen in an event in society (50%), and t is the theoretical value (1.96) a certain degree of freedom and a determined level of lapse according to the frequency of being seen, which is required for the +/- deviation value (0.05). Accordingly, the number of people to be sampled was determined as 321. As a result of the power analysis, it was calculated that when 321 child health and diseases experts were included in the study with a moderate effect size (f = 0.25), 80% power would be obtained at 95% confidence level. A total of 324 child health and diseases experts participated in the study; thus, the sample size was considered sufficient. The data was analyzed by SPSS statistics program v. 22 (IL, Chicago, USA). The knowledge, attitudes and behaviors of pediatricians about Covid-19 disease were evaluated. The questions related to age, gender, marital status, children in family, measures taken, and pediatric Covid-19 cases were evaluated. For the questions about the relationship between Covid-19 and pediatric cases, scoring was performed for each correct answer (mortality and incidence with four points and disease characteristics with 1 point each). The respondents that scored below 4 points in total were considered to have low level of knowledge, while those that received 4 points and above were considered to have high level of knowledge. The mean scores of the physicians and the factors affecting them were calculated by the logistic regression analysis. Prior to the study, the approval of the local non-interventional clinical research ethics committee was obtained (2020/81829502.903/19).

## Results

The sociodemographic characteristics of the physicians are summarized in Table 1. The physicians' source of information, self-reported knowledge levels, responses to the questions about Covid-19 and mean scores are shown in Table 2. Of the pediatricians, 43.8% thought that their knowledge about the subject was at a low or moderate level. The most frequently used sources were the official websites and/or social media connections of health authorities, such as the Turkish Ministry of Health and the World Health Organization (WHO). The mean score of the respondents in the two questions related to Covid-19 was 4.42 ± 2.3. Figure shows the precautions that the participant physicians took against Covid-19 in their daily and professional lives. It is seen

**Table 1:** Sociodemographic characteristics of the pediatricians

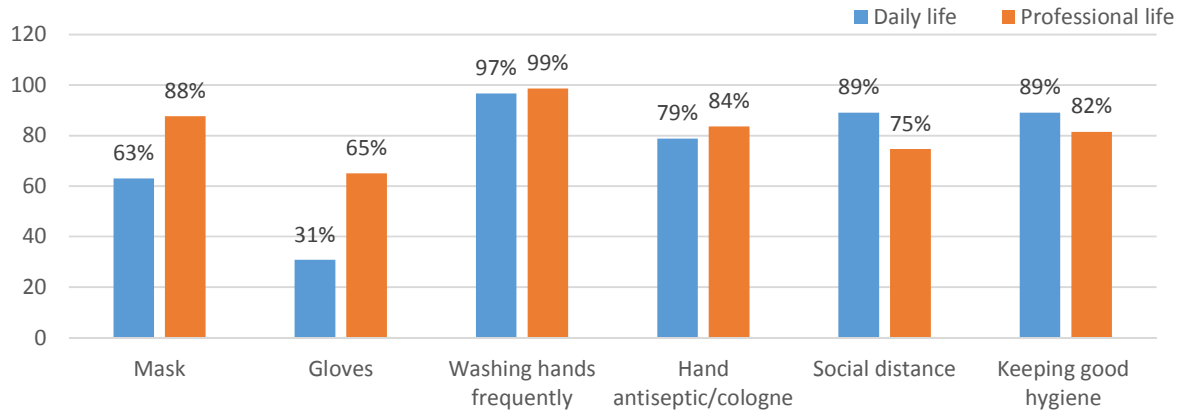
| | |
|---|---|
| Age (years) | 35.42 ± 6.19 |
| Gender (Male/Female) (%) | 43.5/56.5 |
| Marital status (Married/single) (%) | 73.5/26.5 |
| Having a child/children (Yes/No) (%) | 63/37 |
| Living with a person older than 60 years (Yes/No) (%) | 25.9/74.1 |
| Having a chronic disease (Yes/No) (%) | 14.2/85.8 |
| Type of workplace (state/university/private)(%) | 55.6/21.3/23.1 |
| Foreign travel history of the person or history of close contact with such person within the last three months (Yes/No) (%) | 9.9/90.1 |

**Table 2:** Physicians' source of information, self-reported knowledge levels, and responses to the two questions about Covid-19

| | |
|---|---|
| **Information sources (%)** | |
| Official websites of health authorities, such as the Turkish Ministry of Health and the World Health Organization | 88.4 |
| Medical books, academic articles, and literature search | 65.3 |
| Informative meetings and councils held at the workplace | 54 |
| Communication tools, such as WhatsApp and Viber, and social media posts | 51.7 |
| Television and/or newspapers | 44.2 |
| **Self-reported knowledge level (%)** | |
| Very good - I fully master the subject | 16.7 |
| Good Moderate | 39.5 |
| Low | 36.1 |
| No | 7.7 |
| | 0 |
| **Covid-19 and pediatric patient relationship (%)** | |
| Mortality and incidence information ** (Correct answer / wrong answer + undecided) | 49.7/50.3 |
| Correct features and / or features of an infected child | |
| * Asymptomatic carrier | 87.1 |
| * High rate of transmission to adults | 61.2 |
| * Presence of upper respiratory tract infection findings | 78.8 |
| * Severe pneumonia (less often) | 27.9 |
| * Multiorgan dysfunction (rare) | 11.6 |
| Future consequences not known | 68.7 |
| Scientific research is very important | 50.6 |
| Total score received (mean ± Std. Dev.) | 4.42±2.3 |

**whether mortality and incidence were high or low, the responses of 'low' to both or the responses of 'low mortality' and 'unknown incidence' were considered correct, which was scored as 4 points. * Each correct answer was scored as 1 point.

that they used masks and gloves more frequently in their professional lives, and the most common measure taken was washing hands frequently. Furthermore, it was remarkable that the rate of physicians who thought that these measures were sufficient was only 22%. While 44% of the physicians stated that they planned to restrict the number of patients they saw, the percentage of those stating that they would isolate a patient in the presence of history of overseas contact was quite high ( 76%). The participants with a score of 0-3.99 were considered to have a low level of knowledge and those with a score of 4 and above were considered to have a high level of knowledge. When the factors affecting this situation were calculated by the logistic regression analysis, it was determined that physicians over 35 years of age had approximately two times (CI: 1.224-3.497) and those with chronic diseases had approximately 2.1 times (CI: 1.042-4.25) greater



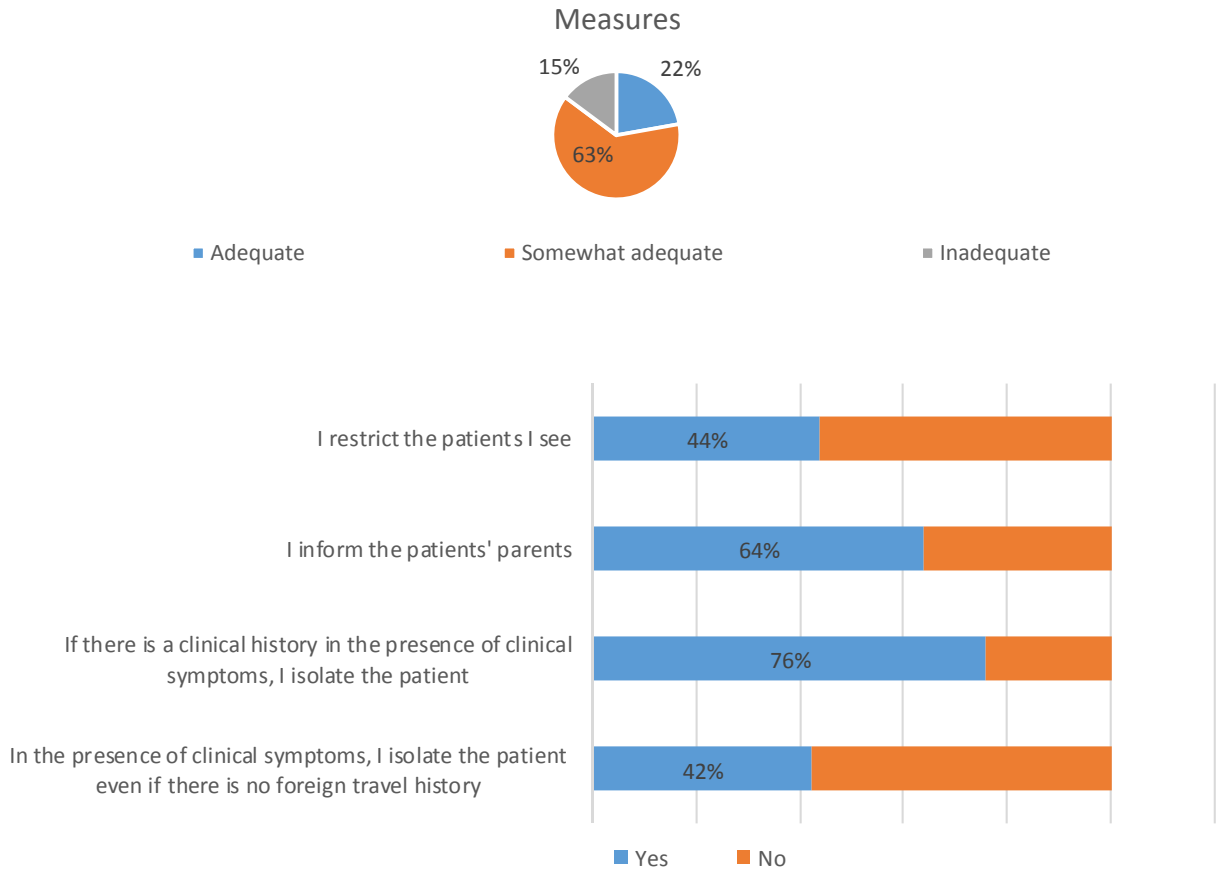




**Figure 1.** (1a,1b,1c): Measures taken by physicians in their daily and professional lives and thougths

**Table 3:** Logistic regression analysis results of the scores obtained in response to the two questions about Covid-19 in relation to pediatric patients

| **Dependent variable : Total score about the knowledge of Covid-19 in relation to pediatric patients (for >4 point)** | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | **B** | **S.E.** | **Wald** | **p** | **OR** | **95% CI** |
| Gender | Male<br>Female | 0.172 | 0.239 | 0.522 | 0.470 | 1.188 | 0.744-1.897 |
| Age | 35 years and above<br>Before 35 years | 0.727 | 0.268 | 7.373 | 0.007 | 2.069 | 1.224-3.497 |
| Marital status | Married<br>Single | 0.155 | 0.380 | 0.166 | 0.684 | 1.166 | 0.554-2.460 |
| Having a child | Yes<br>No | 0.153 | 0.365 | 0.177 | 0.674 | 1.167 | 0.570-2.383 |
| Living with a person older than 60 years | Yes<br>No | 0.321 | 0.267 | 1.445 | 0.229 | 1.378 | 0.817-2.324 |
| Having a chronic disease | Yes<br>No | 0.744 | 0.359 | 4.303 | 0.038 | 2.105 | 1.042-4.25 |
| Type of workplace | State<br>Other | 0.252 | 0.227 | 1.233 | 0.267 | 1.287 | 0.824-2.009 |
| [1]Information source 1 | Yes<br>No | 1.686 | 0.370 | 20.794 | 0.000 | 5.40 | 2.616-11.148 |
| [2]Information source 2 | Yes<br>No | 0.812 | 0.230 | 12.428 | 0.000 | 2.254 | 1.434-3.540 |
| [3]Information source 3 | Yes<br>No | 0.281 | 0.238 | 1.394 | 0.238 | 1.324 | 0.831-2.109 |
| [4]Information source 4 | Yes<br>No | 0.137 | 0.237 | 0.336 | 0.562 | 1.147 | 0.721-1.827 |

[1] Official websites of health authorities, such as the Ministry of Health and the World Health Organization
[2] Informative meetings and councils held at the workplace
[3] Medical books, academic articles, and literature search
[4] Communication tools, such as WhatsApp and Viber, and social media posts

level of knowledge compared to the remaining respondents. In addition, following the official websites of health authorities, such as the Turkish Ministry of Health and WHO contributed 5.4 times (CI: 2.616-11.148) and attending meetings held at their institutions contributed 2.25 times (CI: 1.434-3.540) to their knowledge of Covid-19 (Table 3). Of all the respondent physicians, 95.2% were worried about being infected and 97.3% were concerned that they would infect someone else. At the same time, 57.8% of physicians agreed with the statement, "If I was an expert of primary adult patients, such as internal medicine, infectious diseases or adult emergency specialists, I would increase the preventive measures and/or would have higher anxiety"

## Discussion

The Covid-19 disease, which has spread to more than 100 countries around the world and is known with high mortality rates, especially in elderly patients with chronic diseases. This organism, which is a genetically mutant coronavirus, clinically causes acute respiratory distress syndrome more frequently in adults, but is more moderate in children according to the reports published so far (8). The asymptomatic status of the virus, mild diarrhea, nasal congestion in upper respiratory tract infection, nasal discharge, etc. have been observed in children more frequently, but there have been fewer reports of severe pneumonia and even rarer cases of multiorgan dysfunction (3,9). Mortality ranges from 2 to 6% in adult patients, varying from country to country depending on the rate of elderly population, the measures taken, and the state of health systems (10,11). However, the rate of Covid-19 has been consistently observed to be very low for pediatric patients compared to adults in all countries (10-12). It was reported that only two of 25 children patients diagnosed with Covid-19 in China developed severe pneumonia symptoms, but death was not observed (12). In another study involving 2143 pediatric patients, more than 90% of cases were found to have no symptoms or their clinical state was very mild (13). Although the majority of children being asymptomatic suggests that the real incidence of Covid-19 may not be low in this group, many studies have confirmed that both incidence and mortality related to the disease are low in pediatric cases (13,14). Presently, we know that the virus is transmit person-to-person by droplets and the speed of transmission is very high(13-15). Epidemiological studies suggest that at least 10 times the number of diagnosed patients should be considered to have been infected (15). At this point, the role of asymptomatic carrier children cannot be denied (15). When we asked pediatricians about this relatively new and limited information, they scored over 4 points on average, which is a promising finding. However, 43.8% of our physicians thought that they had a moderate or low level of knowledge (14). Physicians over 35 years and those with chronic diseases having approximately two times greater level of knowledge can be associated with the available data indicating advanced age and accompanying chronic diseases as the causes of high risk, of which the respondents were probably aware(13,14). The information obtained from the official sites of health authorities, such as the Turkish Ministry of Health and WHO, and the informative meetings held at health institutions seem to have positively contributed to the level of knowledge of our physicians. The presence of false or missing information shared on social media increases the importance of meetings, symposiums and conferences to be organized in healthcare institutions. In the case of a pandemic, developing a vaccine, slowing down the spread of the disease, and taking all the necessary measures to this end are very valuable. When we examined the precautions taken by our physicians in relation to the Covid-19 pandemic, we observed that washing hands was the most frequent measure taken, followed by the use of masks and gloves in professional life, but the application of the social distance rule was at a lower rate. Hand washing and keeping good hygiene are among the primary recommended measures and effective ways of protecting against Covid-19 infection (16,17). Wearing a mask is especially protective against diseases transmitted through droplets and microparticles; thus, it is strongly recommended to reduce the spread of respiratory viruses (18). In study conducted in 2010, it was seen that health workers wearing masks reduced the influenza transmission at a rate of 65.7% (19). WHO recommends gloves for healthcare and laboratory staff, but not for patients and their relatives (2). Frequent changing of masks, disinfectant use and hand washing are much more effective in reducing the spread of the virus (20). More than half the physicians that participated in the current study also reported to have adopted the use of masks not only in their professional but also daily lives as a measure against the disease. Social distance is another vital factor in decreasing the transmission of the virus. According to the scenarios proposed according to the statistical calculations, Covid-19 will infect around 80% of people in the world and

results in the death of millions of people unless sufficient social isolation is undertaken (21). It is very important to understand the concepts of quarantine, limited quarantine, and social distance and to act as quickly as possible to take the necessary preventive measures depending on the socioeconomic status of the country. However, due to the nature of their profession, pediatricians have to be in close contact with pediatric patients and their caregivers. A significant number of our physicians stated that they found the measures taken to be only somewhat adequate. Additionally, it was found that over 95% of the physicians were anxious about becoming infected and infecting someone else, which, combined with primary adult-related expertise, could further increase their anxiety levels. From this point of view, it can be inferred that 87.1% of the physicians were aware that pediatric patients were mostly asymptomatic carriers, but they thought that adult patients constituted a greater risk for both themselves and their relatives. In a study carried out in China, it was observed that especially women and nurses had high levels of depression and anxiety about the Covid-19 pandemic (22). Healthcare professionals constitute the greatest risk group in terms of not only physical but also mental consequences of pandemics (23). To reduce these negative effects on healthcare personnel, we think that it is necessary to take more measures, improve their work environment, and increase their motivation. In conclusion, it is essential to increase the level of knowledge and awareness of pediatricians, organize more informative meetings about Covid-19, facilitate young pediatricians' participation in these meetings, develop methods of coping with their anxiety, and acquire more knowledge about the pandemic considering that pediatric cases may be helpful in shedding light on the treatment of the disease.

**Ethical approval:** Was obtained from the Faculty of Health Sciences of Kafkas University (approval number: 81829502.903/19).

**Conflict of interest:** None

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**Author contribution:** design of the study, wrigting HBB, other ÇEBB

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