



## Pandemic process in children

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### Abstract

**Aim:** When compared to adults, it is seen that the COVID-19 disease in children has a milder course. However, considering that there are cases with severe course and even death, it is aimed to analyze the COVID-19 PCR positivity in children according to age and gender.

**Materials and Methods:** Between March 7, 2020 and August 18, 2021, throat and nose swab samples from children with clinical complaints or a history of contact were evaluated by reverse transcriptase polymerase chain reaction (RT-PCR) and the distribution of positive children by age and gender classified.

**Results:** The PCR test was positive in 3,181 (30.74%) out of 10,342 children, the highest positivity rate was 33.52% in male and in the 15-18 age range, while this rate was 36.77% in female in the 15-18 age range.

**Conclusion:** In this study, it was determined that the prevalence of the COVID19 pandemic, which affected the whole world, in childhood age groups was highest in male and between the ages of 15-18.



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### Introduction

The COVID-19 virus is in the beta coronavirus (beta-coronavirus) family, which includes SARS-CoV and MERS-CoV, affecting the whole world in just three months, causing the World Health Organization (WHO) to declare a pandemic [1]. COVID-19 is transmitted from person to person primarily through droplets. If the droplets spread by the sick person when sneezing or coughing come into contact with objects, doorknobs, toys by other people, and people rub their hands in their mouth, nose and eyes, it can cause contamination [2,3]. Although it is reported that the transmission of COVID-19 disease in children is mostly by indoor contact, the positive effects of practices such as suspending education and training in schools all over the world and in our country, and prohibiting adults from going out with children on the street are very important. The mild course of the clinical findings of COVID19 disease in children compared to adults may cause children to be overlooked as contagious [4]. For the diagnosis of COVID-19 disease, the most basic test is to

search the upper or lower respiratory secretions with RT-PCR. In addition, higher viral load was detected in swab samples taken from the lower respiratory tract compared to those taken from the upper respiratory tract. For this reason, it is recommended to repeat the upper respiratory tract samples or take a swab from the lower respiratory tract according to the patient's clinic in people who have previously had a negative result in nasopharyngeal or oropharyngeal swab samples but are clinically suspected to have COVID-19 disease. Although RT-PCR positivity is detected in stool samples, its routine use is not recommended [5].

### Materials and Methods

Our study included fever, headache, weakness, myalgia, malaise, sore throat, cough, shortness of breath, nausea, vomiting, diarrhea in children with a history of contact or clinical complaints between March 8, 2020 and August 18, 2021 in XXXXX center and districts. – made with samples of patients from whom combined nose and throat swab was taken. In this study, Bio-speedy SARS-Cov-2 (2019-nCoV) RT-qPCR Detection Kit (Bioeksen, Istanbul, Turkey) and Coronex COVID-19 rt-qPCR Detection Kit (DS Bio ve Nano Teknoloji, Ankara, Türkiye), kits

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Covid-19 PCR positivity was determined by working with the RT-PCR BIORAD (Qiagen, Germany) device according to the manufacturer’s instructions and evaluating in accordance with the manufacturer’s instructions. Patients were separated from electronic medical records as demographic (gender, age). In this study, the number of samples in the data is shown as n and calculated as a percentage.

For this study, permission was obtained from the Presidency of the Non-Invasive Ethics Committee of the Faculty of Medicine of Firat University with the Decision No: 2021/11- 42 and the date: 04.11.2021 and the Helsinki Declaration criteria were taken into consideration.

*Statistical analysis*

SPSS (Statistical Packages of Social Sciences, SPSS for Windows, Version 18.0, Chicago, IC, USA) package program was used for statistical analysis of the data.

The chi-square test was used to detect differences between categorical variables. P values <0.05 were considered statistically significant.

**Results**

In total, 3,181 (30.74%) of 10,346 pediatric patients were positive for PCR test. 4,996 (48.30%) of the patients were male and 5,346 (51.70%) were female. The PCR positivity percentage was statistically significantly higher in girls (p=0.034). PCR positivity also showed a statistically significant difference between age groups (p<0.001). Analysis of PCR positivity according to demographic data is shown in Table 3. The age range with the highest positivity in male is 15-18 years, and 799 (33.52%) of 2,383 patients in this group were positive. The positivity in girls according to age range is given in Table 2. The age range with the highest rate of positivity in female is 15-18, and 986 (36.77%) of 2,681 patients in this group were positive. With these rates we found, it can be said that COVID-19 PCR positivity shows a rapid increase in children, especially in boys and between the ages of 15-18.

**Discussion**

COVID-19 disease affects all age groups, but a small proportion of COVID-19 patients are children. For children, the main source of infection is mostly positive patients within the family. The incubation period has been defined as 3–7 (the longest 14 days) days after contact with the patient [6]. While cough accompanying fever is among the most common complaints in studies conducted on children with COVID 19 disease, gastrointestinal symptoms such as sore throat, myalgia, malaise, loss of appetite, runny

**Table 1.** PCR positivity in male by age distribution.

Age group	Number of people	PCR (+)	%
0-4	768	175	22.78%
5-9	762	162	21.25%
10-14	1.083	351	32.40%
15-18	2.383	799	33.52%
Total	4.996	1.487	29.76%

**Table 2.** PCR positivity in female according to age distribution.

Age group	Number of people	PCR (+)	%
0-4	743	202	27.18%
5-9	823	195	23.69%
10-14	1.099	311	28.29%
15-18	2.681	986	36.77%
Total	5.346	1.694	31.68%

**Table 3.** Analysis of PCR positivity according to demographic data.

	PCR (+)	PCR (-)	Total	p value
<b>Gender, n (%)</b>				
Male	1487 (29.8%)	3509 (70.2%)	4996 (100%)	0.034
Female	1694 (31.7%)	3562 (68.3%)	5346 (100%)	
<b>Age group, n (%)</b>				
0-4	377 (25.0%)	1134(75.0%)	1511 (100%)	<0.001
5-9	357 (22.5%)	1228 (77.5%)	1585 (100%)	
10-14	662 (30.3%)	1520 (69.7%)	2182 (100%)	
15-18	1785 (35.2%)	3279 (64.8%)	5064 (100%)	

nose, headache, weakness, difficulty in breathing and vomiting, diarrhea may also be seen [7]. In studies conducted to date, it has been reported that COVID-19 disease is milder in children and adolescents (12-18 years old) compared to adults [8]. It is rare for pediatric patients to stay in intensive care and result in death from the disease. It can be interpreted that children have healthier respiratory tracts compared to adults (less exposure to air pollution and tobacco and tobacco products), create an active natural immune response, and have fewer chronic diseases compared to adults. They may have a milder disease due to differences in the angiotensin system (RAS) receptors and altered inflammatory responses to pathogens [9,10]. The asymptomatic picture in adolescents prevents the detection of positive patients and thus causes the spread of the disease. For this reason, adolescents have a great role in the epidemic as carriers [8]. Studies have reported that the frequency of asymptomatic infections in children may be between 4.4% and 16.0% [11,12]. It was reported that 0.6 of them developed clinically acute respiratory distress and multiorgan failure [13]. In a study conducted in China, they reported that 94 (4.4%) of the children were asymptomatic, 1,088 (51.0%) mildly symptomatic, 826 (38.7%) moderate findings and 1 child died [14]. In our study, it was determined that the highest positivity was between the ages of 15-18 (adolescence), which was 33.52% in male and 36.77% in female. In the study of Wu and Mcgoogan, as of March 10, 2020, less than 1% of 72,314 patients were younger than ten years of age, and that of 31 of 171 children examined, 18.1% it was stated that they were younger than one year old, 60.8% were male and 64.9% were diagnosed with pneumonia [15]. Merkus et al., in a study conducted on 1391 children in a children’s hospital in Wuhan, determined the incidence of COVID-19 as 171 (12.3%) and

the mean age of these children as 6.7 [16]. According to the report announced on March 30, 2020 in Turkey, 117 (1%) of 11,535 patients were pediatric patients, 13.6% of COVID-19 positive children were under the age of 1 and 3 of them were newborns, and 53% were male. It has been reported that 48.7% of children have a history of contact [17]. In April 2020, Dong et al. In the retrospective review of 2135 pediatric patients with COVID-19, who were followed up by the Chinese Center for Disease Control and Prevention between January 16 and February 8, 2020, 728 (34.1%) of the patients were laboratory-diagnosed, 1,407 (65%) were classified as suspicious cases. It has been reported that the mean age of all pediatric patients was 7 years and 1,208 (56.6%) of them were male, and there was no statistically significant difference between male and female [11]. In our study, 4,996 48.30% of 10,342 pediatric patients were male, 5.346% 51.70 of them were female and 3,181 (30.74%) of them were positive for PCR test. The highest number of PCR positivity between the ages of 15-18 in both male and female (33.52%-36.77%), and the least PCR positivity between the ages of 5-9 years in both male and female (21.25%-23.69%).

### Conclusion

Although most of the pediatric patients are asymptomatic, it should be kept in mind that children infected with the virus may play a role in the spread of the disease. Taking measures to prevent disease and complying with these measures, and most importantly, preventing transmission by screening contacted children, will reduce the number of new patients and will alleviate the burden on the health system. Female were evaluated as a higher risk group than male.

### Conflict of interest

The authors declared no conflict of interest regarding this article.

### Ethical approval

For this study, permission was obtained from the Presidency of the Non-Invasive Ethics Committee of the Faculty of Medicine of Firat University with the Decision No: 2021/11-42 and the date: 04.11.2021.

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