



## Sars-cov-2 infection and vaccination in children and adolescents, and rule of cloud computing in healthcare system

Maziar farhadi <sup>1,\*</sup>, Nahid Masoodpoor <sup>2</sup> and Pouria Rahnama <sup>1</sup>

<sup>1</sup> School of Dentistry, Azad Tehran University of Medical Sciences, Tehran, Iran.

<sup>2</sup> Department of Pediatrics, School of Medicine, Rafsanjan University of Medical Sciences, Rafsanjan, Iran.

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### Abstract

The beginning of the COVID-19 pandemic in the world has brought many problems to the world. It is a respiratory disease. Dry cough and fever are known as their most common symptoms. When a sick person sneezes or coughs, the virus can be transmitted from one person to another through small droplets. Although this disease is generally milder in children than adults, severe cases and even death have been reported among children and adolescents. The aim of this study is to provide a review of the information that has been published so far about this disease in children and adolescents.

**Keywords:** Covid19; Vaccination; Children; Cloud computing; Healthcare system

### 1. Introduction

The outbreak of the 2019 Coronavirus (COVID-19) in the world caused a lot of financial losses and human Casualties (1). This emerging disease is evolving rapidly, and even pregnant women are susceptible to this disease, which can cause negative effects during pregnancy (2). The coronavirus is a respiratory pathogen found in both upper and lower respiratory tracts in samples collected from patients (3). Fever, dry cough, malaise, lethargy, shortness of breath, and myalgia are the most common symptoms (4). When a sick person who is infected with the Covid-19 virus sneezes or coughs, the virus can be transmitted from one person to another through small droplets (5). Using mouthwash can reduce the possibility of human coronavirus transmission and minimize the virus load in saliva and aerosols (6-7). The latest variant of this virus is Omicron. At least in adults, it appears to be more infectious due to evasion from the immune system, but this variant has been reported to be less likely to be associated with severe disease (8-9). It has been said that for reasons that are not yet fully known, children are less likely to get this disease and have a lower mortality rate than older people (10). Of course, serious complications can occur in children that require hospitalization and more complex treatment procedures (11). Several vaccines introduced to the market have been reported to be completely safe for children between the ages of 5 and 11 years (12). This study aims to review the information mentioned about COVID-19 in children and compare the published data between the omicron variant and the previous variants.

### 2. Signs and Symptoms

The findings indicate that most children infected with the coronavirus had symptoms such as dry cough, fever, and fatigue (10), upper respiratory symptoms (nasal congestion and running nose), and occasional gastrointestinal symptoms such as nausea, vomiting, and diarrhea (13). Also, some of the ill children had no signs of pneumonia or radiological symptoms; some had radiological features but no signs of infection (14). In addition, Cai et al. reported that in their study, the average fever lasted for 2.5 days and was usually not higher than 39 degrees Celsius. Also, this disease was self-limiting in children without special treatments (15). It has been reported that the Omicron variant causes a

\* Corresponding author: Maziar farhadi

Azad Tehran University of Medical Sciences, School of Dentistry, Tehran, Iran.

milder disease than Delta in children and adolescents, and the rate of hospitalization and the need for mechanical ventilation was lower. Also, children aged 6 to 18 years are more likely to have a milder disease than children under six (16). Although, in general, the symptoms of Covid-19 are more severe in adults than in children, In some cases, severe illness and long-term complications have also been observed Such as multisystem inflammatory syndrome (MIS-C) which is seen in a number of child patients that appear after the initial infection. (17), which can be a serious life-threatening issue (18). Moreover, this pandemic can indirectly endanger children's mental health and make them suffer from depression and anxiety (19).

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### 3. Diagnosis

Like adults, the diagnosis begins with the evaluation of the contact between the child and the sick person (20), and then the PCR test should be done. The World Health Organization has provided guidance for identifying the virus in different countries.(21) Onal et al. have reported that IP-10, IL-1 and IL-12 levels can be used as diagnostic factors. The prognosis of the disease can also be predicted by using the D-dimer and IP-10 levels (22). What is more, it is stated that intraoral lesions, such as blisters and painful oral ulcers, mostly visible on the cheek mucosa, could be early indicators of COVID-19 infection (23).

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### 4. Risk Factors

Several underlying factors have been introduced as predisposing factors for the severity of this disease. The most common are obesity, chronic lung disease, neurologic disorders, cardiovascular disease, and blood disorders (24). It has also been said that hypoxia during admission is one factor predicting the disease's severity. Furthermore, lower absolute lymphocyte count (OR 8.33 per unit decrease in 10<sup>9</sup> cells/L) and greater C-reactive protein (OR 1.06 per unit increase in mg/dL) were predictive of severe MIS-C. Race does not affect the severity of the disease (25).

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### 5. Vaccination

For a long time, there was a theory about making a vaccine using mRNA, and finally, the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) vaccine was made using this technology (26). Currently, several vaccines are known to be completely safe for children aged 5 to 11 years (12). Unlike the initial variant of SARS-CoV-2, which the vaccines had a great preventive performance against, it seems that they have a weaker performance against Omicron (27-28). And, of course, vaccines can reduce the risk of the multisystem inflammatory syndrome (29). Among vaccinated children, the overall incidence of systemic events such as fever, chills, and Lymphadenopathy was lower (12). Although there is still little information about vaccination in children, there are disagreements about its effectiveness, considering the damages caused by this pandemic and the damage it can cause to different parts of children's lives if vaccines are safe and effective. They should be provided for children (30).

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### 6. Cloud Computing and COVID-19

Combining the phrases "cloud" with "computing" yields the phrase "cloud computing." The term "cloud" is an abbreviation of "cloud," which is a symbol commonly used to represent the internet. It has been determined that a theoretical idea exists, such as data storage in unknown places, unknown physical systems, omnipresent access, and outsourced administrations. Also known as computation, computing is the process of reintegrating information technology methods, coordination/temporal logic, and storage [31,32]. Statistical data analysis and data management in the medical health system are of the utmost importance and necessitate a relevant application in order to provide high-quality help to patients. COVID-19, or new coronavirus 2 illness, is regarded as the most often uttered word in the world during the past several years [33,34].

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### 7. Cloud Computing across the medical and healthcare industries

Cloud computing provides an environment conducive to fostering cooperation among healthcare professionals, patients, and other parties concerned [32,25]. It might be utilized to address several problems in the medical industry, such as storage capacity, cost effectiveness, and resource reform [36,37]. As a global concern, the coronavirus 2 pandemic has resulted in a number of issues inside healthcare systems, which are insufficiently efficient to accommodate a large number of COVID-19 patients. Consultations, monitoring, and diagnostics pertaining to coronavirus 2 can be performed by healthcare organizations via cloud computing. Another program known as "Pathao

Health" may be used to check the symptoms of coronavirus 2 online using mobile and internet consultations. This mobile application also allows users to obtain prescriptions and purchase medications [32,38].

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## 8. Cloud computing's difficulties in the healthcare industry during the COVID-19 period

Despite the growing demand for cloud computing applications [39], the security and accessibility of cloud apps, particularly for a medical care system that stores and analyzes medical data [32,40], continue to provide a difficulty. In the context of the coronavirus 2 pandemic, there are several chances for cloud computing services to demonstrate their value to the medical industry. Several key difficulties, including as security facts, Internet speed, and improved data, should be the subject of more research pertaining to cloud computing in the medical system [32,41], and microservice-based engineering can play a crucial part in overcoming such obstacles [42].

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## 9. Conclusion

In general, this disease may occur among children with milder symptoms, and some do not. But it can still be dangerous and cause life-threatening problems such as multisystem inflammatory syndrome. Also, underlying factors can affect the severity of the disease, and despite the lack of data, it is recommended that children be vaccinated if possible.

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## Compliance with ethical standards

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### *Disclosure of conflict of interest*

There is no conflict of interest whatsoever.

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