



The Impact of the Opening of the Schools on COVID-19 Epidemiology

COVID-19 Epidemiyolojisinde Okulların Açılmasının Etkisi

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Question: My child goes to private school. In the letter from the school, it was said that face-to-face education could be done if desired. Should I send my child to kindergarten, primary school and middle school during the COVID-19 period? (Questions from different physicians were arranged as a single question)

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Answer (Beyhan Bülbül, MD; Mustafa Hacımustafaoğlu, MD)

Due to the COVID-19 pandemic that started in China in December 2019 and spread all over the world, more than 90% of the students worldwide have been affected by education loss. Continuation of school education is considered very important and indispensable. However, another indispensable issue is to protect the health of students, as well as the teachers-trainers and other education workers. These two situations must be considered in balance. Quality health and quality education are the assurance of the future. In our country, there are more than 60.000 schools, more than 18 million students, over one million teachers, and school staff with various services. The pandemic has resulted in serious education losses worldwide due to school closures, with more than 90% of the students (more than 1.5 billion students) affected by education loss worldwide.

Pediatricians are aware of the importance of schools as more than just educational tools. Schools are educational and developmental environments where social and emotio-

nal abilities are gained besides education, social equality is ensured more among children than out-of-school environments, healthier food intake, exercise and sports opportunities are provided. Schools are also considered safer than out-of-school environments. Face-to-face education in schools provide positive educational opportunities that cannot be achieved with online education. Even in well-resourced families, the lack of teacher authority can cause problems for children to focus on the lesson. In addition, staying in front of the computer for a long time can lead to some additional health problems. It should be kept in mind that children who are economically deprived will have more difficulties in accessing online education (such as the availability of computers suitable for education, uninterrupted internet problems, difficulties in concentrating in the crowded home environment). Even in the USA, it has been shown that approximately 1/5 of middle school and high school students cannot connect to the internet for online education at home for these reasons. It has also been shown that students who stay away from school especially during adolescence have an increased risk of being in unwanted environments, forming and making

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harmful habits and friendships, and becoming more vulnerable to violence and abuse when the family cannot sufficiently care for various reasons. For children who are actually absent from school for a long time, especially in the first years of primary school, consequences of withdrawal from school and adaptation difficulties can create significant problems. In addition, working parents who plan their lives according to their children's schools may experience additional difficulties due to children not attending school, which can, in turn, create social, psychological, and labor problems.

As is known, opening schools leads to an increase in respiratory tract infections in children in general. Crowded and poorly ventilated environments in colder winters when schools are open can predispose to many respiratory infections (such as influenza). However, COVID-19 infection has different epidemiological characteristics from the flu. While the flu tends to spread mainly from children to adults and cause epidemics, COVID-19 is more likely to be transmitted from adults to adults, or from adults to children. The fact that influenza vaccines in Turkey have not been offered to the free market this year has created a negative picture in terms of protection from influenza. In COVID-19 infection, the risk increases even more because of not having a COVID-19 vaccine and not having certain effective drugs that provide a cure accepted in the world. In addition, COVID-19 disease differs from similar respiratory diseases because the immune response in the community has not yet developed, and therefore the risk of epidemics is still very high. During winter months, the findings of flu and similar diseases common in children are similar to COVID-19. Another point is that COVID-19 protective measures (such as mask, distance, staying away from crowded environments, hand hygiene) in the society will also be protective from other respiratory infections transmitted by droplets.

Unlike many other infectious diseases, COVID-19 tends to be both less frequent and less severe in children than adults. In surveillance studies conducted in various countries around the world, it has been found that children constitute only 1-8% of all laboratory-proven COVID-19 cases. In a meta-analysis, in cases with laboratory evidence, only 2% of the children have a severe course requiring hospitalization (average 15% in adults), 0.7% of cases have critical symptoms requiring intensive care (5% in adults) and only 0.08% of the pediatric cases (average 3.5% in adults) resulted in mortality. In Turkey, during the 2020 year, from March 11 to July 26, of the 227 cases, 107 were laboratory confirmed (PCR +) cases, 7.2% was <15 years of age, and 13.9% were between 15-24 years. With these data, the rate of pediatric cases in our country seems somewhat higher than the world. Again, during this period, in our country, 0.2% of all COVID-19 deaths were seen at the age of <15 years. In summary, in light of the evidence-based data, the possibility of getting COVID-19 infection in children (especially at the

age of <10 years) has been found to be much lower compared to adults.

It is proposed that the role of children in the transmission of COVID-19 disease to other people is less than that of adults. In household transmission, after a person becomes ill, the rate of contamination to other households is generally between 10-20%. This figure is much lower (0.5-7%) in children and it is nearly 5 times less than adults. In addition, it has been shown that the probability of children being the index case is only 5-10% of the family-borne outbreaks, and transmission to children is caused more than 90% of the cases from adults. It is thought that viral shedding in the throat in children lasts shorter than in adults. In addition, the general opinion emerging from the studies is that children are generally not super spreaders in terms of COVID-19. Asymptomatic children may have a role in transmitting the disease. However, it is well documented that asymptomatic adults can transmit the disease and is more common than in children.

Transmission in schools and educational places: It has been demonstrated that COVID-19 transmission to others in school and between students is lower than expected (less than 0.5%) and COVID-19 transmission to students is caused mainly from sick adults rather than other students. In addition, it is thought that the risk of COVID-19 transmission to adult staffs in the school environment is not higher than the risk of transmission in the community or at home.

Concerning the COVID-19 infection, there are limited studies on whether the disease rate increases with the opening of the schools, both in schools and in the community. In the spring period of 2020, when the pandemic started in Denmark and Finland, the two countries that first closed and then opened schools, it was confirmed that there was no change in the number of cases in school-age children (<16 years) with the opening of the schools. Disease rates were not affected by the re-opening of the schools, and the expected increase in infection rates did not occur. There was no difference in disease rates between Sweden (which never closed schools) and Finland (which opened and then closed the schools). In Israel, an increase in the rate of cases was observed in high school students about 10 days after the schools were opened, probably due to insufficient preventive measures. The re-opening of schools in Spain, Thailand, South Africa, Norway, and Japan did not cause a significant difference in the cases. However, the re-opening of the schools resulted in higher cases in students in England and Germany, and in the USA, there were inconsistent results (higher rate of cases in the 15-24 age group, but not in the younger school age). Considering the evidence-based data, it can generally be concluded that the re-opening of schools in the world did not have a direct and major effect to the increase of the pandemic.

In Turkey, due to the pandemic COVID-19, the schools were closed throughout the country in March 16, 2020. At that time, according to the official data of the Ministry of Health, the total number of cases per day was reported to be 18. Then, the daily case numbers across the country began to rise; it was 4801 on April 16, 1610 on May 16, 1467 on June 16, 947 on July 16, 1192 on August 16, and 1771 on September 16. Hence, after the closure of the schools across the country, the number of daily cases initially increased, then started to decrease in the summer season. The number of daily cases in September 2020, compared to July 2020, increased almost twice during school closure. After the schools were re-opened (September 16th, 2020), daily cases became 1873 on October 16th and 3045 on November 13th (26). Due to COVID-19, the schools all over the country were again closed on November 14th. Daily number of cases, 7 days after school closure (and with some measures taken across the country), became 5103 on November 20, 2020, 6713 on November 23, 2020, 6876 on November 26, 2020, and 6420 on December 08, 2020. Briefly, the re-opening of the schools in our country did not increase the COVID-19 cases, and the closure of the schools did not decrease the cases, suggesting that school closures did not have a significant effect in the reduction of cases (or even increase). These data show that the number of COVID-19 cases in our country is not directly related to school re-opening or closing. However, it should be emphasized that schools should be opened only after having taken the appropriate measures.

COVID-19 measures in schools in general should be employed in all areas of school life. The hallmarks of these measures include staying away from crowded environments as much as possible, complying with protective (social, personal) distance, wearing appropriate masks, ensuring with hand, environment and personal contact hygiene, access of sick student, teacher and education staff to the health system before coming to school, and then providing optimal treatment, isolation and regulations for the implementation of protection measures. Measures should be participatory by students, teachers, education staff, parents and the administration. They should also be applicable, decisively sustainable, and flexible according to new conditions.

It should be kept in mind that there may be differences in practical applications of these measures in different schools and different age groups in education. For example, it may not always be possible to wear a suitable mask in young children in preschools and kindergartens. In these places, it may be more important to ventilate the environment well, provide education in large areas and appropriate distance between the students, and ensure frequent cleaning of the environment in the presence of children who cannot control their secretions. On the contrary, in adolescent students (> 10 years), transmission properties may be close to adults. There-

fore, wearing masks, obeying the distance rule and avoiding crowded environments should be more emphasized in these older children. In this article, detailed protection measures in different educational settings and schools are not mentioned.

There can be COVID-19 cases in schools as well as in the public. In that situation, it should be evaluated carefully whether this threatens school health (regarding the cases in students-teachers-school workers and also school-related public cases) and the necessary preventive measures should immediately be taken with actively monitoring the cases. It should be kept in mind that there is no "zero risk" even with the best measures against COVID-19. If there is an epidemic in the school difficult to control, that school may be closed temporarily or sometimes for a longer period. Likewise, in the fall of 2020 in Germany, a few weeks after the schools were opened, an increase in the number of COVID-19 cases was observed in some schools, and two schools were temporarily closed. Schools in other regions continued their education by maintaining routine measures. Depending on the circumstances, regional decisions can be made for the continuation of education in different regions and schools. When necessary, hybrid training (face-to-face training plus distance-on-line training mix) can be applied for a certain period of time. However, this situation must be done in a scientific and controlled manner with flexibility that can vary according to the circumstances. In this respect, administrators should be prepared for adaptation to different conditions, and regular training should be provided to students, teachers and education staff in a transparent manner. The gain of education is the gain of society. The responsibility should also be shared with the awareness of the event.

After the re-opening of the schools, an increase in respiratory infections other than COVID-19 may be possible, and this situation should not be misinterpreted. On the contrary, preventive measures to be applied consistently in the community and in schools can contribute to the reduction of not only COVID-19 but also other respiratory infections in children.

Conclusion

As a physician, as well as a teacher and/or academician, it should be emphasized that quality education and quality health are the assurance of the quality of the future generations of the country. It should be said that it is important to continue face-to-face education after taking necessary preventive measures, especially in pre-school, primary and secondary school periods, except in unusual conditions. There may also be COVID-19 cases at school as in other places. However, it is necessary to make a rational evaluation, whether this threatens school and also public health, and to take the necessary and most appropriate measures immediately. It should not be forgotten that education earnings are the earnings of the country, and it is the guarantee of the future.

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