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Review Article

Urgent need to strengthen school health in Asia and the Pacific islands

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Abstract

In Asia and the Pacific island region, strengthening of school health activities and measures is urgently recommended to deal with the impact of the increasing risk of potential school closures due to continuation of the coronavirus disease 2019 (COVID-19) pandemic in 2021. As the incidence of COVID-19 in 2020 was relatively low in these regions, many of the countries were able to avoid prolonged school closures. However, even if vaccination is expanded in the future and the pandemic tends to come to an end, the risk of SARS-CoV-2 variants spreading among children will also increase, and the possibility of having to close schools again will also increase.

Key words Asia, COVID-19, Pacific island, school closure, school health.

Experience in minimizing school closures

Many countries in East Asia, Southeast Asia, and the Pacific island region either did not close schools or, if they did, they succeeded in doing so quickly and only for a very short time due to the coronavirus disease 2019 (COVID-19) pandemic. For example, in Japan, schools were closed during the first wave of the pandemic at the beginning of 2020 but not during the second wave after July or the third wave at the end of 2020. The infection rate was kept low without school closures, possibly because the children were not the primary carriers of the virus but also as a result of the effectiveness of infection control in the schools following the strengthening of school health capacity over the years in these regions. In Okinawa Prefecture, Japan, with a population of 1 million, the number of COVID-19 clusters reported in 2020 was 86, but only five clusters occurred in educational institutions,¹ and only 3.5% of the estimated infection sources were located in schools or nursery centers.² The Ministry of Education, Culture, Sports, Science, and Technology of Japan reported that, among the children who were infected with COVID-19, 79% of primary school children and 63% of secondary school children were estimated to have been infected by their family members, whereas 4% and 8%, respectively, of these children were

estimated to have been infected in schools. This pattern was not observed among high school students, in whom the main estimated infection sources were schools (25%), family members (33%), and from unknown sources (34%).³

Most of the Pacific island countries closed schools for 2–4 weeks at the beginning of the pandemic and then re-opened them. According to data from the United Nations Children's Fund (UNICEF), between 11 March 2020 and 2 February 2021, schools were not closed on any days in Nauru and Tokelau and were closed 5–6 days in the Marshall Islands and Niue; 11–21 days in Tuvalu, Tonga, Vanuatu, Kiribati, Cook Islands, Singapore, Solomon Islands, and Samoa; and 30 days in Papua New Guinea (PNG).⁴ For example, school closures in PNG started on 6 April 2020, and the government reopened the schools on 4 May 2020,⁵ whereas in Taiwan, the government decided to extend the winter holiday for another two weeks.⁶

In terms of COVID-19 prevention in schools, Taiwan and some Pacific island countries, such as the Marshall Islands, Micronesia, Samoa, and the Solomon Islands, declared, planned, and implemented several measures, e.g. hygiene and sanitation, social distancing, and ventilation,^{7–12} whereas PNG pointed out their lack of resources for implementing hygiene and sanitation measures.⁵ Taiwan also set the conditions for school closure when a student is infected with COVID-19.¹³ The Ministry of Education in Taiwan has a website specific to COVID-19 in which it mentions children's mental health.¹⁴ Similarly, the Ministry of Education, Culture, Sports, Science, and Technology in Japan issued a manual for COVID-19 preventive measures in schools that also mentioned the need for

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attention to **the** mental health of both teachers and the children.¹⁵ However, no specific details on addressing the mental health needs of either group were provided.

Impact of school closures

School closure is an efficient way to contain infectious diseases, and in Japan it is enshrined in Article 20 of the School Health and Safety Act. In the case of localized outbreaks of influenza infection, short-term school closures have effectively controlled the spread of the virus.¹⁶ In the Spanish flu pandemic of 1918, a correlation between early and sufficient long-term school closure and reduced mortality has been estimated.¹⁷ Nationwide school closures have not been experienced in many countries since then. In the current COVID-19 pandemic, school closure was one of several proactive measures taken in many European countries and the USA.

However, school closures caused more negative effects than positive impacts in containing the spread of COVID-19. Despite the short closure period, several review articles have been rapidly published examining health-rated behaviors and mental health conditions as health outcomes. These studies found that the COVID-19 restrictions, including school closure, have had adverse effects on health outcomes in young people.^{18–21} Focusing on individual studies, a study in the USA reported that sedentary behavior increased, and physical activity decreased among children aged 5–13 years during the school closure period. School children engaged in about 90 min of school-related sitting activities and over 8 h of leisure-related sitting activities per day.²² Consequently, the prevalence of overweight among children will increase,²³ whereas children who depend on free meals in schools might experience undernutrition.²⁴ In addition, a Chinese study reported that the prevalence of myopia in elementary school children in 2020 was higher than that before the COVID-19 pandemic, probably due to decreased outdoor activities and increased computer screen time at home.²⁵ Other studies in China showed that the prevalence of behavioral problems among school-aged children increased²⁶ and that anxiety, depression, and stress were the most prevalent symptoms.²⁷ Moreover, life satisfaction among adolescents in Norway decreased compared to that before the COVID-19 pandemic.²⁸ A negative impact of school closure on university students has also been reported in the USA. Alcohol consumption by students increased as time progressed, and those with depression and anxiety increased their alcohol consumption compared to other students.²⁹ In Japan, the negative influence of school closure on suicide was a concern. However, the suicide rate among children and adolescents during the period of school closure did not change;³⁰ rather, suicide cases seemed to increase after reopening of the schools (Fig. 1). Moreover, in **10** a school closure group and school reopening group, **10** sleep rhythms, eating habits, and physical activity worsened in the school closure group. However, time spent with family and sleeping were longer in the school closure group.³¹

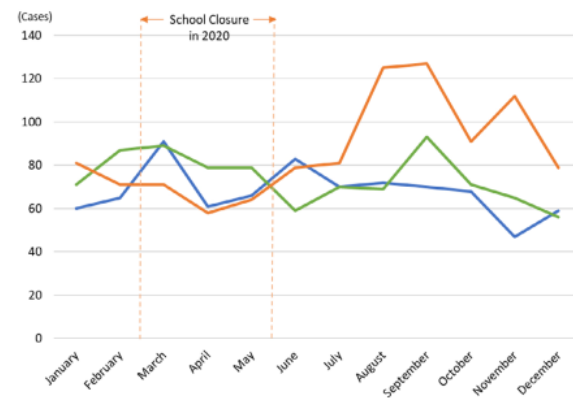


Fig. 1 Number of suicides among students (primary schools, secondary schools, high schools, and universities) by month during 2018–2020. Data from Ministry of Health, Labour and Welfare, Japan. Blue line: 2018; green line: 2019; orange line: 2020. The period between the orange dotted lines indicates the duration of school closure due to the COVID-19 pandemic in 2020 (March to May 2020).

Other issues related to child welfare were also observed during school closures. In the USA, reported cases of child maltreatment decreased during the period of school closure because the interactions between the child and school personnel who usually report maltreatment allegations were removed.³² An increase in parental stress during school closure was also reported in Japan.³³

Need to address the spread of sars-cov-2 variants

The current influx of SARS-CoV-2 variants into the region will make it more challenging for schools to respond. The SARS-CoV-2 VOC202012/01 B.1.1.7 variant, which was first reported in the UK in December 2020 and is currently circulating in Asian countries, is reported to be more transmissible.³⁴ In May 2021, more than 80% of the positive cases in the metropolitan areas of Tokyo and Osaka in Japan were due to infection with this mutated strain. Furthermore, infections and severe illnesses among the young age cohorts have been reported in Japan,³⁵ and the spread of the infection from elementary schools to universities is a potential fear. A double-mutant variant that is causing the rapid spread of infection and a large spike in deaths in India was also detected in Japan, Australia, and Malaysia in May 2020.³⁶ In India, this mutated strain is spreading throughout the country, and it was announced that cases of infection and deaths among young adults might be increasing.³⁷ Although changes in the pathogenicity of this variant have been confirmed, it is assumed that its transmissibility has increased; thus, countries in the Asia-Pacific island region should be on high alert.

In the islands of Asia and the Pacific, it will be necessary to strengthen infection control urgently through school health

activities and the response to adverse effects during school closures. The fact that Japan, Taiwan, and Indonesia have been able to avoid or limit school closures is not simply because there were fewer infections among children but was also due to the effectiveness of strengthening school health activities. In Japan, the education sector developed its action guidelines and made sure that hand washing and infection control during school lunches were thoroughly implemented.

In Okinawa, the number of infections among children has increased since early May 2021, leading to the closure of schools. In Japan, the Ministry of Health, Labour and Welfare has requested an expert committee to discuss changing the vaccination target from 16 years old and above to 12 years old and above as a measure to cope with this situation.³⁸ This is mentioned on the basis of the safety of the Pfizer-BioNTech vaccine,³⁹ which is currently the primary vaccine used in Japan. In Asia and the Pacific islands, it will be necessary to consider lowering the target age for vaccination after confirming the evidence on the safety of vaccination and the incidence of adverse effects in children.

Considering the further influx and spread of mutant strains in the future, it will be necessary not only to expand the vaccination program to children but also to continue to strengthen these activities and to prepare to deal with the impact of additional school closures. Along with the use of distance education, its unintended effects such as Internet addiction will also need to be addressed. We also suggest that there should be more cooperation with the social welfare sector to prevent violence against children. In terms of travel, unlike Japan, Taiwan, Indonesia, the Philippines, and Guam, the Pacific island nations of Micronesia and Melanesia have long had strict restrictions on entry. Although vaccination programs will be promoted and borders might be open for visitors, the possibility of an epidemic due to an influx of variants cannot be ignored. We suggest that, along with strengthening health-care services, we should also begin to strengthen the school health services in these countries. It has also been speculated that SARS-CoV-2 will become a recurrent seasonal infection while continuing to cause some degree of social damage.⁴⁰ To be prepared for this scenario, school health programs must be strengthened with an emphasis on close coordination with the local government units where the schools are located. The basis for the school health system has been promoted in these areas since 2000,⁴¹ and we recommend that the system be further strengthened to continue to manage the effects of the COVID-19 pandemic on schools in this region.

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Authors' contributions

J.K. conceived the present idea. J.K., R.T., and M.T. wrote the manuscript in consultation with ¹¹ T., E.R.G., and H.K. C.M. E., M.M., N.W., K.Y., and R.I. contributed to the collection of the information. All of the authors read and approved the final manuscript.

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