


Letter to the Editor

Coronavirus disease 2019 (COVID-19) preparedness in a Thai International School: Emotional health and infection control practices

Nutradee Narupaves¹, Purisha Kulworasreth¹, Nuchcha Manaanuntakul¹, David K. Warren MD, MPH²,
David J. Weber MD, MPH³ and Anucha Apisarntharak MD⁴ 

¹Ruamrudee International School, Bangkok, Thailand, ²Division of Infectious Diseases, Washington University School of Medicine, Saint Louis, Missouri, United States, ³University of North Carolina, Gillings School of Global Public Health, Chapel Hill, North Carolina, United States and ⁴Division of Infectious Diseases, Thammasat University Hospital, Pathum Thani, Thailand

To the Editor—The advent of the coronavirus disease 2019 (COVID-19) pandemic has greatly impacted the learning environment in schools. Many primary schools worldwide have switched to online learning, and most private schools have opened with numerous infection prevention measures.¹ Uncertainty in the natural history of COVID-19 includes the infectivity of asymptomatic and presymptomatic children in school as well as the frequency of within school transmission of COVID-19.^{2,3} Thus uncertainty has resulted in strict infection prevention measures taken at schools to ensure the safest environment for both students and teachers. Previous studies have shown that COVID-19 has an impact on anxiety and fear levels of healthcare personnel and patients.^{4,5} Nevertheless, the impacts of COVID-19 on emotional well-being on students and teachers in schools has not been well studied.⁶ In this study, we evaluated the emotional health of students and teachers as well as infection prevention practices at an international school during the COVID-19 outbreak in Thailand.

We performed an online survey of students and teachers attending Ruamrudee International School, Bangkok, Thailand, from February 1, 2021, to April 30, 2021, to evaluate their emotional health, infection prevention practices regarding COVID-19, and the school's preparedness plan. The online survey was distributed to students and teachers (grades 6–12) for participation. Data collected included student and teacher demographics; school infection prevention measures; confidence levels in the school's infection prevention measures, and changes in infection prevention behaviors in both school and community settings, knowledge of COVID-19 transmission, and emotional health inclusive of anxiety, worry, and stress. Respondents rated their confidence level on knowledge and school preparedness plan on a Likert scale from 1 to 5 (1, no confidence to 5, very confident) also changes in their infection prevention behaviors on a Likert scale from 1 to 5 (1, never use to 5, always use). Infection prevention behavior changes (eg, hand hygiene, wearing a mask, and physical distancing) were defined as a rating of 4 (almost always) or 5 (always). We used the Generalized Anxiety Disorder 7-item (GAD-7) scale to categorize

anxiety following the original scale: 0–4, minimal anxiety; 5–9, mild anxiety; 10–14, moderate anxiety; and >14, severe anxiety.⁴ Self-rated worry about acquiring COVID-19 and its negative impacts were rated on a Likert scale of 1 to 10 (1, not worried to 10, extremely worried). Analyses were performed using SPSS version 15 software (IBM, Armonk, NY). Categorical data were compared using a 2-tailed χ^2 or Fisher exact test, as appropriate. Adjusted odds ratios (aORs) and 95% confidence intervals (CIs) were computed; a significant statistical difference was defined as $P < .05$.

Overall, 274 participants consented to study participation; 218 (79.6%) were students, 56 (20.4%) were teachers, and 192 participants (70.1%) were in high school. The infection prevention policies include temperature checks, hand hygiene, wearing masks, and physical distancing (≥ 1 m). The overall confidence toward school measures to prevent COVID-19 transmission was 72.6% for temperature checks, 73.0% for wearing masks and hand hygiene, and 50.7% physical distancing (Table 1). Furthermore, 64 participants (23.4%) were worried about acquiring COVID-19 and potentially spreading it to their friends and families; 101 participants (36.9%) felt stress about it, and 207 participants (75.5%) felt at least minimal anxiety about it. Notably, 228 participants (83.2%) reported wearing a mask in the community; 154 participants (56.2%) reported physical distancing in the community; and 133 participants (48.5%) reported washing their hands more frequently in both school and community settings. There were no statistically significant differences in practices between students and teachers.

By multivariate analysis, receiving accurate information from academic sources was associated with changing behavior in hand washing (aOR, 1.44; 95% CI, 1.15–1.8), wearing a mask (aOR, 1.37; 95% CI, 1.05–1.8), and physical distancing (aOR, 1.9; 95% CI, 1.3–3.29) in the community. Similarly, receiving education on infection prevention measures at school led to changing behaviors regarding hand hygiene (aOR, 1.26; 95% CI, 1.1–4.9), wearing a mask (aOR, 1.3; 95% CI, 1.2–2.2), and physical distancing (aOR, 2.3; 95% CI, 1.3–4.1) in the community, while having regular workshop discussions on COVID-19 prevention in school was associated with improved hand washing (aOR, 1.2; 95% CI, 1.1–3.6) and wearing a mask (aOR, 2.1; 95% CI, 1.9–4.7) in the community. Notably, participants who did not report anxiety were less likely to wear a mask (aOR, 0.46; 95% CI, 0.27–0.77) and to practice physical distancing (aOR, 0.72; 95% CI, 0.75–0.95) in the community.

Author for correspondence: Anucha Apisarntharak, E-mail: anapisarn@yahoo.com

Cite this article: Narupaves N, et al. (2021). Coronavirus disease 2019 (COVID-19) preparedness in a Thai International School: Emotional health and infection control practices. *Infection Control & Hospital Epidemiology*, <https://doi.org/10.1017/ice.2021.236>

Table 1. Student and Teacher Characteristics, Emotions, and Infection Control Practices

Variable	No. (%) (N = 274)
Age, median y (range)	16 (11–64)
Sex, female	137 (50)
Occupation	
Student	218 (79.6)
Teacher	56 (20.4)
Section	
Middle school	82 (29.9)
High school	192 (70.1)
Confidence toward	
School's policy for hand hygiene	200 (73)
School's policy for physical distancing	139 (50.7)
School's policy for mask requirement	200 (73)
School's policy for temperature check before campus entry	199 (72.6)
Emotions toward COVID-19	
Worried to return back to school due to COVID-19	42.0 (15.3)
Worried that COVID-19 will impact learning and teaching negatively	80 (29.2)
Worried of acquiring COVID-19 from school	29 (10.6)
Worried of acquiring COVID-19 and spread it to others	64 (23.4)
Feeling stressed due to COVID-19	101 (36.9)
GAD-7 score	
Minimal anxiety	75 (27.4)
Mild anxiety	78 (28.5)
Moderate anxiety	30 (10.9)
Severe anxiety	24 (8.8)
Sources of COVID-19 News	
Knowledge from school	176 (64.2)
Social media ^a news	78 (28.5)
Official ^b news source	168 (61.3)
Improvement in infection control practices	
Washing hands more frequently	133 (48.5)
Wearing a mask in public	228 (83.2)
Physical distancing in school	91 (33.2)
Physical distancing in community	154 (56.2)
Suggestion to reduce stress due to COVID-19	
School to provide adequate masks	146 (53.3)
Workshops to provide continuous knowledge for COVID-19 prevention	66 (24.1)

Note. GAD-7, Generalized Anxiety Disorder 7-item.

^aSeveral social media platforms including Line, Facebook, Instagram.

^bOfficial news sources, which includes academic sources from the medical community, news sources from news agency, and news sources from the government.

This study has several limitations. The study design was a self-reported online survey. It was conducted at a single center, and sample size was small. Despite these limitations, participants were overwhelmed with emotions, especially anxiety toward COVID-19. However, most of the participants remained confident in the school's policies to prevent COVID-19. Notably, several infection prevention measures continued to be practiced at sub-optimal levels at both school and community settings, whereas

changes in several infection prevention behaviors were practiced in the community. Having continuous education particularly focusing on hand washing and physical distancing in school remains critical to improving adherence to both school and community infection prevention measures. Accurate and reliable academic information as well as receiving education on infection prevention measures at school led to changes in 3 new normal behaviors (ie, hand hygiene, wearing mask, and

physical distancing). This change likely was due to the increasing awareness by students and teachers towards COVID-19 prevention. Additional studies to evaluate strategies to improve infection prevention practices at schools are needed.

Acknowledgments.

Financial support. No financial support was provided relevant to this article.

Conflicts of interest. All authors report no conflicts of interest relevant to this article.

References

1. Lobo JL, Del Ser J, Bifet A, Kasabov N. Spiking neural networks and online learning: an overview and perspectives. *Neural Networks* 2020;121: 88–100.
2. Li, G, Li W, He X, Cao Y. Asymptomatic and presymptomatic infectors: hidden sources of coronavirus disease 2019 (COVID-19). *Clin Infect Dis* 2020;71:2018.
3. Zimmerman KO, Akinboyo IC, Brookhart MA, *et al.* Incidence and secondary transmission of SARS-CoV-2 infections in schools. *Pediatrics* 2021. doi: [10.1542/peds.2020-048090](https://doi.org/10.1542/peds.2020-048090).
4. Apisarnthanarak A, Apisarnthanarak P, Siripraparat C, Saengaram P, Leeprechanon N, Weber DJ. Impact of anxiety and fear for COVID-19 toward infection control practices among Thai healthcare workers. *Infect Control Hosp Epidemiol* 2020;41:1093–1094.
5. Apisarnthanarak A, Siripraparat C, Apisarnthanarak P, *et al.* Patients' anxiety, fear, and panic related to coronavirus disease 2019 (COVID-19) and confidence in hospital infection control policy in outpatient departments: a survey from four Thai hospitals. *Infect Control Hosp Epidemiol* 2020. doi: [10.1017/ice.2020.1240](https://doi.org/10.1017/ice.2020.1240).
6. Cullen W, Gulati G, Kelly BD. Mental health in the COVID-19 pandemic. *QJM* 2020;113:311–312.