Facilitators and Barriers of Elementary School Reopening during the Covid-19 Pandemic: A Qualitative Study

Monavar Fattahiyan [1], * Maryam Seraji [2], Hassan Okati-Aliabad [3]

[1] Master's degree in health education and health promotion, Faculty of Health, Zahedan University of Medical Sciences, Zahedan, Iran.

[2] PhD in Health Education and Health Promotion ,Assistant Professor, Health Promotion Research Center, Zahedan University of Medical Sciences, Zahedan, Iran.

[3] PhD in Health Education and Health Promotion , Associate Professor , Health Promotion Research Center, Zahedan University of Medical Sciences, Zahedan, Iran.

Abstract

Background: Elementary School closures are much less effective than other social distance interventions in controlling the COVID-19 pandemic because of the low rate of SARS-CoV-2 transmission between children in educational settings. Therefore, Identifying facilitators and barriers to school re-opening can help parents and school staff plan for students' return to school. In this study, we examined the facilitators and barriers of school re-opening during COVID-19 from the perspective of parents and school staff of Zahedan, southeast of Iran.

Methods: We did a qualitative study using conventional content analysis. Participants were selected by purposive sampling in May 2021, in Zahedan, southeast of Iran. Data was collected through semi structured and in-depth interviews. Credibility, dependability, confirmability, and transferability were established to assure data trustworthiness. Audio-recorded interviews were transcribed verbatim and analyzed in accordance with Graneheim and Lundman.

Results: We recruited 14 parents, five teachers, and five school principals from 7 elementary schools in Zahedan. Data analysis showed that overcrowding, financial problems, failure to comply with protocols and lack of proper educational space were identified as barriers to school re-opening. Also, teaching health protocols, providing health conditions for schools and preference for in-person learning were identified as facilitators of school re-opening.

Conclusion: Parents and school staff expressed their views on facilitators and barriers to reopening schools. Due to the different strains of covid 19, there is a possibility of re-peak at any time. Identifying facilitators and barriers of school re-opening will be effective in planning and policy-making of school re-opening programs during the COVID-19 and after Corona pandemic for promoting the health of school staff and students.

Key Words: Barriers, COVID-19, Facilitators, School re-opening, Qualitative study.

Corresponding Author:

Maryam Seraji, PhD in Health Education and Health Promotion ,Assistant Professor, Health Promotion Research Center, Zahedan University of Medical Sciences, Zahedan, Iran. Email: serajimaryam@gmail.com

1- BACKGROUND

The World Health Organization has announced that the number of deaths due to covid-19 until April 12, 2023 has been 6,897,025 in the world and 145,571 in Iran (1) . Despite strict control measures around the world, due to its having different strains, COVID-19 may rise again. Following the COVID-19 pandemic, most countries closed their schools as part of national lockdown measures. However, school closures are much less effective than other social distance interventions in reducing mortality due to COVID-19, preventing only 2-4% of deaths (2). Also, school closures are not a major factor in slowing down the spread of the COVID-19 (3). Children may leave home or be cared for by non-household members during school closures. They will have social interactions with others, which increases the likelihood of infection and challenges the effectiveness of school closures (4).

Notably, children do not play an important role in the transmission of SARS-CoV-2. They can be infected, but it is mainly transmitted from adult family members to children and transmission between children or children to adults seems to occur less frequently (5). Evidence shows that SARS-CoV-2 transmission is much lower among school children than other respiratory viruses such as influenza (6). Children mainly get SARS-CoV-2 infection from their family members and at all ages they are reported to have mild symptoms or be asymptomatic, have a good prognosis, and recover within 1 to 2 weeks after the onset of the disease (7).

One year after the outbreak of COVID-19, almost half of the world's students are still partially or entirely out of school (8). In addition to disrupting the educational system, school closures affect other aspects of students' lives (9). The rate of SARS-CoV-2 transmission in educational settings is low; children and school staff do not significantly contribute to COVID-19 transmission through attendance in educational settings (10). Following the partial and complete re-opening of schools in England in 2020, the infection rates of SARS-CoV-2 in primary schools were low (11). Evidence after the full reopening of schools showed that the rate of SARS-CoV-2 infection in school-age children was associated with the rate of community infection. While schools were open, the national lockdown reduced child infection rates (12). By implementing public health strategies, schools that are essential services can be safe. Therefore, they must remain open to in-person learning to guarantee equitable learning environments (13).

Governments face many problems with when and how schools reopen and must make proper plans for reopening schools. Understanding the views of school staff and parents on the factors that facilitate and barrier the reopening of schools is helpful for effective planning. Due to different types of covid-19 and the possibility of its resurgence at any time, we may have to close schools again. So, in this study, we examined the facilitators and barriers of school re-opening during COVID-19 from the perspective of parents and primary school staff in Zahedan, southeast of Iran.

2- MATERIALS AND METHODS

2-1. Design and Participants

We conducted a qualitative study based on the conventional content analysis approach to obtain detailed descriptions of parents' and school staffs' concerns about elementary school re-opening during the COVID-19 pandemic. This study was conducted during the school closure in Zahedan, southeast of Iran. Eligible participants included parents, teachers, and elementary school principals who were rich in information, spoke fluently, were informed about their participation, and

were willing to share information. Participants were recruited through purposive sampling. Sampling continued until data saturation, the point at which no new themes emerged from the participants' experiences. Variation in cultural context, geographical area, and socio-economic level was considered to obtain diversity in participants' concerns.

2-2. Instruments

Data were collected through semi-structured and in-depth interviews about facilitators and barriers of school re-opening during the COVID-19 pandemic. An interview guide (**Table 1**) was developed for this study to focus on important topics, maintain consistency across interviews, and stay on track during the interview process. Interviews began with broad data-generating questions. Open-ended follow-up questions were used to obtain detailed explanations, and examples. Probing questions, such as "Can you explain more about that?" and "What do you mean by that?" were used to gain in-depth understanding.

Table-1: Interview guide

Row	Questions
1	"Please tell me, did you agree with the closure of schools during the COVID-19 outbreak?"
2	"Schools are scheduled to reopen in September 2021. Are you planning to keep your child at home, or do you want to send him to school?"
3	"What are the facilitators of school re-opening?"
4	"What are the barriers to reopening schools?"

2-3. Procedure

Participants' characteristics were asked before the interview. The first author conducted semi structured and in-depth interviews at a time convenient for participants, mostly in empty classrooms or in the school health room and in some cases in the schoolyard, to maintain social distance and observe health protocols. The interviews were audio-recorded after explaining the reason for recording the interviews and obtaining permission from the participants.

2-4. Data Analysis

Data analysis began at the same time as data collection. At the end of each interview, the audio recordings were transcribed verbatim. The transcripts were then read several times to develop an impression of the overall trend of participants' responses and comments. Qualitative content analysis was used in accordance with Graneheim and Lundman (14). 1- First, the interviews were conducted and after several times of study, a general concept was obtained from them. 2- The text of the interviews was divided into several meaning units and then coding was done. 3- Codes were placed in groups based on similarities and differences in sub-classes and similar classes. 4- Themes were reorganized and extracted from the latent content of the interview texts. Credibility, dependability, confirmability, and transferability were established to assure data trustworthiness. To ensure the validity of the data, the implemented text of the interview and the codes were checked with the participants and the ambiguities were revised and corrected. To maintain reliability, data collection, implementation, coding and data analysis were done simultaneously. In order to increase transferability, people with different socio-economic characteristics

and from different parts of the city were selected. Also, for data verifiability, the text of the interviews and the codes were reviewed and approved by the supervisor and consultant. (15).

3- RESULTS

Our sample consisted of 14 parents, five teachers, and five principals recruited from 7 schools in Zahedan in May 2021. The characteristics of the study participants are summarized in **Table 2**.

There was no requirement for students to attend school during the interviews, and virtual learning was provided.

We explored the facilitators and barriers of school re-opening during the COVID-19 pandemic from parents, teachers and elementary school principals using conventional content analysis. Thematic redundancy was obtained with the 20th interview, and then 4 participants were interviewed to confirm thematic redundancy.

Table-2: Characteristics of the study participants

Variable		Parents	Teacher s	School staffs
		n	n	n
Gender	Female	9	3	-
	Male	5	-	-
education	Primary school	2	-	-
	High school	3	-	-
	University	6	5	3
	MA	2	-	2
	PhD	1	-	-
Age (years)	30-39	6	-	-
	40-49	7	5	4
	≥ 50	1	-	1
Number of school- age children	1	5	-	-
	2	7	-	-
	3	2	-	-

Each interview lasted an average of 30 minutes. Participants described overcrowding, financial problems, failure to comply with protocols and lack of proper educational space as barriers to school re-opening. **Table 3** shows the list of key themes, subthemes, and representative quotes related to school re-opening barriers. Furthermore, we found teaching health protocols, providing health conditions for schools and preference for in-person learning as facilitators of school re-opening. **Table 4** shows the list of key themes, subthemes, and representative

quotes related to school re-opening facilitators.

4- DISCUSSION

To our knowledge, this is the first qualitative study investigating the facilitators and barriers to school re-opening during the COVID-19 pandemic in Iran. The participants described a set of facilitators and barriers. Barriers to school re-opening included overcrowding, financial problems, failure to comply with protocols and lack of proper educational space.

Table-3: Key themes, subthemes, and representative quotes about the barriers of school re-opening

Key themes	Subthemes	Representative quotes
Overcrowding	A large number of students in each class	Our classes have 48 students; how many categories should I divide these 48 students in? How does the teacher deal with these students?
	Break time between Classes and student gathering	Setting a break time between classes is very dangerous for children because children are close to each other; they may eat each other's food, which is problematic.
	Presence of parents in schools	Our main concern now is the parents; we have less concern about the student because the parents will not follow the health protocols. If I tell them, children may follow health protocols, but parents do not.
Financial problems	Loss of parental work due to Covid-19	Here, all parents are workers and have lost their jobs with the outbreak of COVID-19. Now this family, even if I say that they need essentials such as bread, we did not say in vain, well, how do these people now get hygiene items like a mask and come to school?
	Expensive compliance with health protocols	It is challenging for them to follow the health protocol; they need masks and other protective equipment; they are all expensive. All of these features should be available in every shift. I think this isn't easy.
		I have two children; I have to buy at least two face masks and protective equipment every day for my children. Masks are disposable. If I buy two masks and protective equipment every day, all my income will be spent on masks and protective equipment.
Failure to comply with protocols	Difficulty adhering to health protocols for children	It is challenging for children to follow health protocols. It is difficult for us to explain the meanings of these health protocols to children. It is difficult for them to use masks for four hours or use protective equipment regularly.
		I find it unlikely that first graders will follow all the health protocols. No, they do not follow because they have their playfulness and do not follow the health protocols exactly.
	Children do not take health protocols seriously	My child wears a mask, but not everywhere. Now he forcibly puts on a mask wherever I go; when he comes out, I tell him to wash his hands by force. I tell him not to approach anyone, but the children do not listen until they understand the issue; they do not know the danger.

Key themes	Subthemes	Representative quotes
	Non-compliance with health protocols due to pressure from other students	My child says, "Mom, my friends laugh at me; he did not even wear a mask for the last few times, he was ashamed to wear a mask, he said that my friends would make fun of me. Like this right now, when he goes to the alley, I give him a mask to wear, he puts the mask in his pocket! So how do I send this kid to school now?
Lack of proper educational space	Inadequate ventilation of classrooms	Their classrooms are not well ventilated. In my opinion, the school environment is not standard at all. Not generally standard for non-pandemic conditions.
	Insufficient classroom space	The school environment is minimal; schools have three-person benches, sometimes my child says mom is not a place for us to sit, so it is challenging to follow health protocols.

Table-4: Key themes, subthemes, and representative quotes regarding facilitators of school re-opening

Key themes	Subthemes	Representative quotes
Teaching health protocols	Using face masks	Parents should talk to the student and teach students how to use a face mask and urge them not to remove the mask from their face.
	Physical distancing in school	Parents should teach their children about health protocols. Children need to be well aware of how to behave in school, not be close to each other and keep a physical distance.
	Hand washing	Teachers should educate students to wash their hands regularly with soap and water because they touch things like desks, books, and pens. Students must wash their hands with soap and water before contacting their face, mouth and eyes. It may take some time to learn, but we have to.
Providing health conditions for schools	Providing protective equipment at school	If protective equipment such as a mask is available at school, there is no problem for children to go to school. If students do not have protective equipment, the school must provide it to them.
	Monitoring the observance of health protocols in the rest time between classes	School staff should warn students about the need to follow health protocols during the rest time between classes and monitor its implementation.
	Identifying symptomatic students and prevent close contact	If symptomatic people are prevented from entering the school and close contacts are identified, families will send their children to school.
	Vaccinating school staff	As long as the vaccine is made for children, vaccinating school staff can provide a safer environment for students and make it easier for

Key themes	Subthemes	Representative quotes
		parents to send their children to school.
	Cleaning	Following the cleaning instructions before the children enter the school will ensure that the families send their children to the school.
Preference for in-person learning	The effectiveness of in-person learning	Children understand the lesson much better when they are in school, and the teacher can better teach them. The student must learn the alphabet in class and the presence of the teacher.
	Requirements of in-person learning for the first grade	In first grade, the teacher has to see how the student holds the pencil and writes. The alphabet must be written correctly; when a student misses writing an alphabet, he also learns incorrectly. In-person learning is mandatory for the first grade.
	Students' and parents' dissatisfaction with virtual learning	My child was not satisfied with virtual learning and did not like it; he said he was confused and wanted to be in the classroom. My child wanted to be in a quiet environment; I also have a younger child; he would come screaming or making noise, asking for a pencil, interfering with his brother's class, and distracting his brother; it was really challenging.

Also, teaching health protocols, providing health conditions for schools and preference for in-person learning were identified as facilitators of school re-opening.

Most of the participants stated that overcrowding in schools and classrooms, rest time between classes and student gatherings, as well as the presence of parents in primary schools were their main concerns for holding in-person learning and were barriers for schools re-opening. Evidence shows that overcrowding in developing countries is an obstacle to the safe re-opening of schools during the COVID-19 pandemic. Alternative learning methods such as outdoor learning, morning and afternoon shift classes, or the presence of different groups of students at school on alternate days of the week may be the solution to reducing overcrowding in schools (16).

Implementing the social distancing plan and the closure of businesses and the financial problems created after the outbreak of COVID-19 had a tremendous economic impact on the participants of this study. They also believed that the compliance with health protocols is costly, and considered it a barrier to school re-opening. The COVID-19 pandemic had a profound effect on families with school children. And low-income parents experienced more financial problems due to the epidemic than those with higher incomes (17).

The participants in this study had concerns about students' not complying with health protocols. An examination of caregivers' preferences for returning children to school during the COVID-19 pandemic showed that many caregivers were concerned about the appropriate social distance and the use of masks for prolonged periods in elementary-aged

students (18). A comprehensive mitigation strategy including a mandatory behavioral agreement to prevent transmission of SARS- CoV-2 can be effective in students' adherence to school health protocols (19).

Participants in this study mentioned the inadequacy of the educational environment as one of the barriers to school re-opening. Re-opening schools safely may require a combination of strict mitigation measures, including intermittent school days, halving classes, or maintaining small, stable cohorts. But elementary schools can be safely re-opened with the use of stable cohorts and masks (20). If a mask is used, elementary schools can be opened for in-person learning with minimal in-school SARS-CoV-2 transfers, even if it is impossible to maintain a 6-foot gap between student seats (21). Also, using natural ventilation and leaving windows open is an effective way to prevent the spread of COVID-19 in high-density public buildings such as schools (22).

In this study, teaching health protocols by parents and teachers was suggested by the participants as a strategy to facilitate the re-opening of schools in the COVID-19 pandemic. Assessment of knowledge and preventive behaviors among students in re-opened schools showed that most students had inadequate knowledge about COVID-19 and did not engage in COVID-19 preventative behaviors. Therefore, it is necessary to increase students' knowledge about and participation in preventive behaviors from COVID-19 (23).

Providing school health conditions was one of the facilitators of school re-opening in this study. If health conditions are available, parents will send their children to school with more peace of mind. By observing social distance, strict implementation of hygiene tips, cleanliness and use of quarantine, the prevalence of the COVID-19 in schools can be reduced (24).

Also, symptom screening is one of the valuable strategies in safe school re-opening (25). Vaccination for school staff, mask requirements, physical distancing and increased ventilation are important strategies that elementary schools can implement to provide safer in-person learning environments .Implementing these strategies makes SARS-CoV-2 transmission in schools much less than that in the community (26, 27).

Participants in this study preferred in-person learning because of its greater impact on students and the problems of virtual learning. School closures can affect community resilience by affecting social welfare services, human development, childcare, sustainable employment, and solidarity (28).

Evidence shows that 54% of parents of students who receive education only in-person, 30% of children who receive education only online, and 27% of parents whose children receive a combination of in-person and online education are satisfied with the way their children are educated during COVID-19 pandemic (29). It seems that all the mentioned cases of obstacles to reopening and facilitators of reopening schools can help prevent and control diseases such as Covid-19 at the level of schools and communities.

4-1. Limitations of the study:

The current study had several limitations. First, this study was conducted in Zahedan schools during virtual learning; the results may not be generalizable to other regions. Another limitation of this study was that the COVID-19 pandemic affected individuals' willingness to participate in the study, which could have led to selection bias. Despite the limitations, the current study can still add important points to the current knowledge regarding the facilitators and barriers to school re-opening.

5- CONCLUSION

Parents and school staff identified several facilitators, such as training health protocols (Use of face mask, Physical distancing in school, Hand washing), providing hygienic conditions for schools (Provide protective equipment at the school, monitoring the observance of health protocols in the rest times, identifying symptomatic students and preventing close contacts, vaccinating school staff, and cleaning) and preferring face-to-face learning (The effectiveness of in-person learning, requirement of in-person learning for the first grade, Students' and parents' dissatisfaction with virtual learning), and barriers to reopening schools such as overcrowding (the large number of students in each class, break times and student gathering, presence of parents in schools) , financial problems (Loss of parental work due to Covid-19, expensiveness of compliance with health protocols), lack of compliance with protocols (Difficulty adhering to health protocols for children, children's not taking health protocols as serious, Non-compliance with health protocols due to pressure from other students) , and lack of appropriate educational space during the pandemic (Inadequate ventilation of classrooms, Insufficient classroom space). They identified that COVID-19 can affect in-person learning and the health of students and school staff. Therefore, effective measures are needed to reassure parents and school staff that the reopening of schools is safe.

6- IMPLICATIONS FOR SCHOOL HEALTH:

Due to the characteristics of students in elementary school ages and the importance of basic learning that causes subsequent academic success for this group of students, the need for in-person learning in primary school is felt more than ever. Reading, writing and arithmetic skills can be challenging for children

without communication with teachers and without understanding school and classroom space. The findings of this study provide important lessons for school principals in overcoming barriers to school re-opening. School principals should be aware that compliance with health protocols during the re-opening of schools has a positive effect on the satisfaction of teachers and parents and affects the presence of students in school. Schools need to consider the concerns of parents and teachers when they re-open, and they need to develop an action plan. Moreover, schools should provide the necessary resources to take protective measures during re-opening and gain parents' trust. Especially in areas where parents are under the most financial pressure, schools' protective measures can create a safer environment. Teaching health protocols by parents and teachers can help alleviate concerns. School principals can make necessary arrangements with health officials to provide the required educational content and select appropriate training methods. Depending on the circumstances, each school can solve overcrowding by taking measures such as reducing class hours and morning/afternoon or alternate-day shift classes. In the absence of proper ventilation systems, schools can use natural ventilations through opening windows and doors to provide adequate airflow inside the classroom. Monitoring break times and preventing parents from entering the school can be also beneficial. Vaccination of school Staff and teachers before reopening will also be effective. And so, educational programs should be conducted to welcome everyone, especially students, to the vaccination of Covid-19.

7- ETHICAL CONSIDERATIONS

The Ethics Committee of Zahedan University of Medical Sciences approved the study protocol

(IR.ZAUMS.REC.1399.469). Participants expressed verbal informed consent and were assured of confidentiality and anonymity. It was also explained that participation in the study is entirely voluntary, and they can withdraw at any stage of the research.

8- ACKNOWLEDGMENTS

9- CONFLICT OF INTEREST

None.

10- REFERENCES

1. Kalantari M, Abadi HZM, Sedrpoushan N. The effectiveness of grief coping training in a group way in improving the experience of grief caused by covid-19 in women of Yazd city. The Journal of Tolooebehdasht. 2023.

2. Viner R, Russell S, Saulle R, Croker H, Stansfield C, Packer J, Nicholls D, Goddings AL, Bonell C, Hudson L, Hope S, Ward J, Schwalbe N, Morgan A, Minozzi S. School closures during social lockdown and mental health, health behaviors, and well-being among children and adolescents during the first COVID-19 wave: a systematic review. JAMA pediatrics. 2022.

3. Zimmerman FJ, Anderson NW. Association of the timing of school closings and behavioral changes with the evolution of the coronavirus disease 2019 pandemic in the US. JAMA pediatrics. 2021; 175(5):501-9.

4. Brooks SK, Smith LE, Webster RK, Weston D, Woodland L, Hall I, Rubin GJ. The impact of unplanned school closure on children's social contact: rapid evidence review. Eurosurveillance. 2020; 25(13):2000188.

5. Sturgess L. COVID-19 Truth Initiative: Part I. 2022.

6. Yung CF, Kam K-q, Nadua KD, Chong CY, Tan NWH, Li J, Li J, Lee KP, Chan YH, Thoon KC, Ng KC. Novel coronavirus 2019 transmission risk in educational settings. Clinical Infectious Diseases. 2021; 72(6):1055-8.

7. Castagnoli R, Votto M, Licari A, Brambilla I, Bruno R, Perlini S, Rovida F, Baldanti F, Marseglia GL. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection in children and adolescents: a systematic review. JAMA pediatrics. 2020; 174(9):882-9.

8. Unesco E. From Disruption to Recovery (2020). URL: https://en unesco org/covid19/education response.

9. Education U. From disruption to recovery. 2020. Accessed; 2020.

10. Macartney K, Quinn HE, Pillsbury AJ, Koirala A, Deng L, Winkler N, Katelaris AL, O'Sullivan MVN, Dalton C, Wood N; NSW COVID-19 Schools Study Team. Transmission of SARS-CoV-2 in Australian educational settings: a prospective cohort study. The Lancet Child & Adolescent Health. 2020; 4(11):807-16.

11. Ladhani SN, Baawuah F, Beckmann J, Okike IO, Ahmad S, Garstang J, Brent AJ, Brent B, Walker J, Andrews N, Ireland G, Aiano F, Amin-Chowdhury Z, Letley L, Flood J, Jones SEI, Borrow R, Linley E, Zambon M, Poh J, Saliba V, Amirthalingam G, Lopez Bernal J, Brown KE, Ramsay ME. SARS-CoV-2 infection and transmission in primary schools in England in June–December, 2020 (sKIDs): an active, prospective surveillance study. The Lancet Child & Adolescent Health. 2021; 5(6):417-27.

12. Mensah AA, Sinnathamby M, Zaidi A, Coughlan L, Simmons R, Ismail SA, Ramsay ME, Saliba V, Ladhani SN. SARS-CoV-2 infections in children

following the full re-opening of schools and the impact of national lockdown: Prospective, national observational cohort surveillance, July-December 2020, England. Journal of Infection. 2021; 82(4):67-74.

13. Koirala A, Goldfeld S, Bowen AC, Choong C, Ryan K, Wood N, Winkler N, Danchin M, Macartney K, Russell FM. Lessons learnt during the COVID-19 pandemic: Why Australian schools should be prioritized to stay open. Journal of Paediatrics and Child Health. 2021; 57(9):1362-9.

14. Graneheim UH, Lundman B. Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. Nurse education today. 2004; 24(2):105-12.

15. Guba EG, Lincoln YS. Competing paradigms in qualitative research. Handbook of qualitative research. 1994; 2(163-194):105.

16. Sanni UA, Offiong UM, Anigilaje EA, Airede KI, Imam A. A pre-COVID-19 assessment of aspects of the school health programme in some selected Nigerian primary schools: implications for school re-opening during the COVID-19 pandemic in developing country contexts. BMC public health. 2021; 21(1):1214.

17. Chen CY-C, Byrne E, Vélez T. Impact of the 2020 pandemic of COVID-19 on Families with School-aged Children in the United States: Roles of Income Level and Race. Journal of Family Issues. 2022; 43(3):719-40.

18. Limbers CA. Factors associated with caregiver preferences for children's return to school during the COVID-19 pandemic. Journal of School Health. 2021; 91(1):3-8.

19. Volpp KG, Kraut BH, Ghosh S, Neatherlin J. Minimal SARS-CoV-2 transmission after implementation of a comprehensive mitigation strategy at a school—New Jersey, August 20–November 27, 2020. Morbidity and Mortality Weekly Report. 2021; 70(11):377.

20. Head JR, Andrejko KL, Cheng Q, Collender PA, Phillips S, Boser A, Heaney AK, Hoover CM, Wu SL, Northrup GR, Click K, Harrison R, Lewnard JA, Remais JV. The effect of school closures and reopening strategies on COVID-19 infection dynamics in the San Francisco Bay Area: a cross-sectional survey and modeling analysis. MedRxiv. 2020:2020.08. 06.20169797.

21. Hershow RB, Wu K, Lewis NM, Milne AT, Currie D, Smith AR, Lloyd S, Orleans B, Young EL, Freeman B, Schwartz N, Bryant B, Espinosa C, Nakazawa Y, Garza E, Almendares O, Abara WE, Ehlman DC, Waters K, Hill M, Risk I, Oakeson K, Tate JE, Kirking HL, Dunn A, Vallabhaneni S, Hersh AL, Chu VT. Low SARS-CoV-2 transmission in elementary schools—Salt Lake County, Utah, December 3, 2020–January 31, 2021. Morbidity and Mortality Weekly Report. 2021; 70(12):442.

22. Park S, Choi Y, Song D, Kim EK. Natural ventilation strategy and related issues to prevent coronavirus disease 2019 (COVID-19) airborne transmission in a school building. Science of the total environment. 2021; 789:147764.

23. Handebo S, Adugna A, Kassie A, Shitu K. Determinants of COVID-19-related knowledge and preventive behaviors among students in reopened secondary schools: cross-sectional study. BMJ open. 2021; 11(4):e050189.

24. Melnick H, Darling-Hammond L. Reopening Schools in the Context of COVID-19: Health and Safety Guidelines from Other Countries. Policy Brief. Learning Policy Institute. 2020.

25. Ondrasek N, Truong N, Edgerton AK. Marin County: Leveraging Education and

Public Health Partnerships to Support School Reopening. Research Brief. Learning Policy Institute. 2021.

26. Gettings J, Czarnik M, Morris E, Haller E, Thompson-Paul AM, Rasberry C, Lanzieri TM, Smith-Grant J, Aholou TM, Thomas E, Drenzek C, MacKellar D. Mask use and ventilation improvements to reduce COVID-19 incidence in elementary schools—Georgia, November 16– December 11, 2020. Morbidity and Mortality Weekly Report. 2021; 70(21):779.

27. Dawson P, Worrell MC, Malone S, Tinker SC, Fritz S, Maricque B, Junaidi S, Purnell G, Lai AM, Neidich JA, Lee JS, Orscheln RC, Charney R, Rebmann T, Mooney J, Yoon N, Petit N, Schmidt C, Grabeel J, Neill LA, Barrios LC, Vallabhaneni S, Williams RW, Goddard C, Newland JG, Neatherlin JC, Salzer JS; CDC COVID-19 Surge Laboratory Group. Pilot investigation of SARS-CoV-2 secondary transmission in kindergarten through grade 12 schools implementing mitigation strategies—St. Louis County and City of Springfield, Missouri, December 2020. Morbidity and Mortality Weekly Report. 2021; 70(12):449.

28. Fay J, Levinson M, Stevens A, Brighouse H, Geron T, Fellow P. Schools during the COVID-19 pandemic: Sites and sources of community resilience. Harvard University: Edmond J Safra Center for Ethics. 2020.

29. Horowitz JM, Igielnik R. Most parents of K-12 students learning online worry about them falling behind. Pew Research Center. 2020.