

“It’s hard for everyone” systemic barriers to home confinement to prevent community spread of COVID-19

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Abstract

Rapid identification and isolation/quarantine of COVID-19 cases or close contacts, respectively, is a vital tool to support safe, in-person learning. However, safe isolation or quarantine for a young child also necessitates home confinement for at least one adult caregiver, as well as rapid learning material development by the teacher to minimize learning loss. The purpose of this study is to better understand barriers and supports to student home confinement. We conducted a mixed-methods study using focus group discussions and a self-administered online survey with parents and staff members from 12 elementary schools and childcare sites across San Diego County serving low-income and socially vulnerable families. Focus group participants reported that mental distress and loneliness, learning loss, childcare, food, income loss, and overcrowded housing were major barriers related to home confinement. The experiences described by FGD participants were prevalent in a concurrent community survey: 25% of participants reported that isolation would be extremely difficult for a household member who tested positive or was exposed to COVID-19, and 20% were extremely concerned about learning loss while in isolation or quarantine. Our findings suggest that there are serious structural impediments to safely completing the entire recommended course of isolation or quarantine, and that the potential for isolation or quarantine may also lead to increased hesitancy to access diagnostic testing.

Lay summary

Background: During the COVID-19 pandemic, home confinement (isolation and quarantine) are important public health tools to keep children learning in-person at schools. However, isolation or quarantine for young children also means that often their caregivers must also go into home confinement, as well as forcing teachers to adapt their lessons to online teaching.

Purpose: The purpose of this study is to better understand what makes home confinement comfortable or difficult for students and their families.

Methods: We did focus group discussions and shared an online survey with parents and staff members from 12 elementary schools and childcare centers across San Diego County vulnerable families.

Results: Focus group participants said that mental distress and loneliness, learning loss, childcare, food, income loss, and overcrowded housing made home confinement hard to do. Also 25% of survey participants said that isolation would be difficult for a household member who tested positive or was exposed to COVID-19, and 20% were really concerned about their child’s learning loss if the family had to isolate or do quarantine.

Conclusions: Our study’s results suggest that there are serious structural issues for school families to safely go into isolation or quarantine, and because of this may make families more hesitant to get tested for COVID-19.

Keywords Isolation, Quarantine, Home confinement, COVID-19, SARS-CoV-2, School health

Implications

Practice: Services supporting home confinement should consider the importance of systemic barriers in their design and implementation.

Policy: Utilizing a community-school model, in which schools can support parents to access a range of public services to overcome community, institutional, and structural barriers to quarantine and isolation can be an important intervention to reduce the spread of COVID-19 and other communicable diseases in school settings.

Research: Future research should aim to include disaggregated gender data for more robust gender analysis to build on best practices in service delivery in an inclusive and gender-responsive manner.

BACKGROUND

The COVID-19 pandemic has created persistent challenges for school communities as schools balance quality education and efforts to prevent community transmission [1, 2]. With the rise of new SARS-CoV-2 variants of concern and low vaccine uptake among children, schools may serve as an important source of infection increasing the risk of community spread [3, 4]. As recent COVID-19 waves have illustrated, testing, quarantining, and isolation remain a vital set of strategies for school communities to combat the virus.

Throughout the pandemic, home confinement, which includes both isolation and quarantine procedures, has been a standard risk mitigation strategy to prevent transmission of SARS-CoV-2 [5]. However, it creates major disruptions to individuals' work, income, schooling, and caretaking responsibilities [6, 7]. A rapid pivot to remote learning as a result of a positive test or exposure can lead to greater differentials in learning loss for rural, low-income, or otherwise socially vulnerable students [8, 9]. The lack of structural supports for home confinement could deter individuals from testing for COVID-19 even after an exposure or showing COVID-19 related symptoms [6].

Challenges surrounding home confinement are among many systemic failures associated with the pandemic, especially for caretakers who are women and people of color [7, 10–20]. These challenges are compounded for caretakers who face structural barriers such as racism, poverty, language barriers, immigration status, high-risk jobs, and/or historical mistreatment by medical systems and government entities [21–23]. Families who struggle with home confinement are typically members of the same communities that bear the highest burden of illness, death, and long-term disability from COVID-19 [2].

This study explores the barriers and supports for home confinement among school staff and parents in K-8 school and childcare settings that serve socially vulnerable communities. We define successful home confinement as completing the necessary days of quarantine or isolation without experiencing further mental, physical, economic, or social harm.

Methods

The present study is part of a larger SARS-CoV-2 environmental monitoring intervention called Safer at School Early Alert (SASEA). SASEA was designed to detect COVID-19 cases in childcare and K-8 school sites in San Diego County utilizing wastewater and surface sampling surveillance combined with responsive testing. A detailed account of this intervention, its methods and findings is described elsewhere [24]. Data for this study was collected between December 2020 and March 2021. During this time, vaccine distribution was limited to mainly healthcare workers and older adults and children under 18 were not eligible for the COVID-19 vaccine. The County recommended a 14-day quarantine for individuals exposed to SARS-CoV-2 and a 10-day isolation for individuals with suspected COVID-19. SASEA pilot sites were located in census tracts with high levels of social vulnerability according to the California Healthy Places Index in ZIP Codes with COVID-19 rates in the top quintile as of August 2020 [25]. Eight public schools, one charter school, one private school, and three childcare sites participated in the study. After stay-at-home restrictions were relaxed, many K-8 sites began to reopen

in-person and hybrid instruction across San Diego County as the County maintained a daily case rate below 100 cases per 100,000 residents. A number of home-based and childcare centers remained in-person during the stay-at-home restrictions to serve essential worker families since March 2020.

Participants

Staff and parents of children affiliated with all SASEA pilot sites were eligible to participate in the survey and FGD regardless of learning formats (i.e., in-person, hybrid, distance). We employed convenience sampling for both the survey and the FGDs through digital and physical flyers sent via the school. School principals also promoted surveys and FGDs through newsletters and emails to approximately 2,500 participants who were school/childcare staff and parents from all SASEA pilot sites.

We grouped each focus group by type of participants (i.e., parent or staff), language preference, and time availability. We grouped parents and staff in separate FGDs to focus on their unique perspectives. Individuals were eligible to participate if they spoke English, Spanish, Vietnamese, or Arabic, the most commonly spoken languages in the region. We prioritized time availability due to the unpredictable schedules of both school staff and parents during the height of the pandemic.

Measures

Focus group discussion

The FGDs followed a semi-structured guide facilitated by the authors (AV, VO, TL, MF, MN, and AM) based on participants' language preferences. We used the same interview guide for both parents and school staff with the same topic areas. At the beginning of each FGD, we explained the purpose of this study, obtained verbal informed consent, and recorded the interviews via Zoom. For each FGD, one researcher facilitated discussion while the second took notes. Field notes were completed immediately by note-takers and facilitators to keep record of emerging themes and context of FGDs. We asked open-ended questions, followed by probing questions, as necessary. Parents were asked to discuss their perspectives of their child's and their own experiences of home isolation while staff were asked to discuss their perspectives of their students' and their own experiences of home isolation. The research team met regularly to debrief on FGD content and determine if saturation has been reached. We transcribed FGD audio files verbatim and translated Spanish discussions, which were translated by a Mexican American staff researcher with native fluency in Spanish for accuracy.

Community survey

Preliminary results from the qualitative analysis informed the development of the quantitative survey. The community survey was self-administered through Qualtrics allowing participants to respond in English, Spanish, Vietnamese, or Arabic. Participants were asked about basic demographic measures and isolation concerns. In the survey, participants were asked to use a Likert-like scale to indicate their levels of concerns on listed barriers related to quarantining for 2 weeks [26]. These barriers include: household transmission concerns, overcrowded housing, caregiving responsibilities, economic concerns, picking up essentials, and mental distress.

Analysis

We conducted a mixed-methods study using exploratory design which consisted of focus group discussions and a community survey [27]. Study team continued to collect FGD data until salient themes reached code and meaning saturation [28, 29]. We analyzed FGD transcripts with MAXQDA using a mixture of deductive and inductive codes [30]. Notes from the FGDs were used to develop the codebook. Co-first authors double-coded two transcripts individually and created memos during analysis to flag potential discrepancies. We discussed code discrepancies during team meetings until agreement was reached. The focus group discussions guided the selection of barriers included in the survey questions.

Using the survey data, we conducted descriptive univariate analysis to assess levels of concern related to home confinement challenges. During data cleaning we re-coded multiple variables into one: If participants chose either “Picking up groceries” or “Picking up medicine”, we collapsed their response into “Picking Up Essential Goods”. If participants chose either “Caregiving responsibilities for my children”, “Caregiving responsibilities for another household or family member”, or “Arranging childcare”, we collapsed these into “Caregiving Responsibilities”. If survey participants selected either “Losing my job” or “No income for 2 weeks”, we collapsed these variables into “Economic Concerns”. We assigned a score to each level of concern according to the Likert-like scale and averaged the scores (i.e., 1 for not a concern, 3 for very important concern) when collapsed related variables. We then assessed the prevalence of experiences in the survey based on themes that arose in qualitative analysis.

Ethics

FGD facilitators informed participants of the purpose of the study and their rights, and obtained participants’ consent to record the interview via Zoom. Participants were reminded that they were able to disengage or withdraw from FGD or survey at any time. Survey participants provided informed consent through Qualtrics before starting the survey. FGD participants were compensated for their time with a \$25 gift card. All survey participants were entered into a raffle to win one of three \$250 gift cards. We shared preliminary study results through town halls and presentations to parents and staff.

This study received approval from the UC San Diego Human Research Protections Program with Institutional Review Board approval number [201607] prior to inception of research activities.

RESULTS

We received 299 survey responses between December 2020 and March 2021, of which 255 participants completed questions related to isolation. The survey took 15–20 min to complete and 92.0% ($n = 275$) responded in English, 7.7% ($n = 23$) responded in Spanish, and 0.33% ($n = 1$) responded in Vietnamese. Thirteen ($n = 39$) to 14.7% ($n = 44$) did not complete the survey items of interest. Incomplete data was found to be missing at random with respect to gender, race/ethnicity, type of participants (parents/staff/both) and education. Forty-six percent of survey participants were parents and 48% were staff. The majority of survey participants self-identified as female (85.8%), high school graduate or higher (95.9%),

Hispanic or Latino (52.9%) and White (64.2%). Details on the demographic characteristics of survey participants are included in Table 1. Survey results are shown in Fig. 1.

We conducted 15 FGDs between December 2020 and February 2021, that included 11 English-speaking parents, 9 Spanish-speaking parents and 22 school staff members to learn about their perceptions on isolating or quarantining for COVID-19. Each FGD consisted of two to six participants. Six main themes emerged, which we organized into a conceptual framework (Fig. 2) to illustrate how barriers and supports to isolation operate at the institutional, community, and structural levels. Barriers and supports are conceptualized using the socio-ecological framework to show the overlapping relationships. Participants recognized school and local government as institutions that should be responsible for coordinating support to ease the burden of isolation and quarantine. The corners of the triangle indicate the need for an integrated approach to provide supports for families and school staff facing challenges in home confinement.

Table 1 | Demographic characteristics of the participants

Characteristic	Total %	<i>n</i>
Role		
Parent/guardian	45.9	135
Staff member	47.6	140
Both	6.5	19
Gender		
Male	12.3	31
Female	85.8	217
Non-binary/third gender	0.0	0
Prefer not to say	2.0	5
Education		
Less than high school	2.0	5
Some high school	2.0	5
High school graduate or equivalent (e.g., GED)	32.5	81
Bachelor degree	30.1	75
Graduate degree	33.3	83
Race		
Black or African American	3.1	8
Native American or American Indian	3.5	9
Asian American	3.9	10
Native Hawaiian or other Pacific Islander	2.3	6
White	64.2	165
Other	23.0	59
Ethnicity		
Hispanic or Latino	52.87	129
Not Hispanic or Latina	47.13	115
Median	Mean	Inter-quartile range
Age		
39	39.85	13.5 (32–45.5)

Barriers and supports

Mental distress and loneliness

At the community level, FGD participants described the pandemic’s disruption to their lives as “traumatic” and “stressful”, emphasizing the mental toll of home confinement. Over a quarter of survey participants (26.7%) felt that mental distress resulting from a 2-week isolation was a very important concern. Participants emphasized home confinement posing risks to students’ physical, mental, and emotional health. In scenarios where students need to quarantine/isolate, caregivers described being overwhelmed by caretaking, having to find childcare, and feeling cabin fever. Although school staff reported that schools encouraged them to do “self-care”, they felt “burnout” from the added responsibility of navigating distance and in-person learning, making it difficult to have a normal workload or routine and focus on well-being. More often though, the mental distress was attributed to separation from friends, family, and their wider community.

Everyone is impacted when they’re quarantined just, and even just mentally from being quarantined, being separated from their peers, being separated from their friends, not being able to go to the places and do the things that they enjoy. Like that’s really draining, too.

-Female Staff

Disruptions in daily routine and not being able to participate in in-person social settings created a sense of loneliness among staff, parents and students. Additionally, participants noted that being cut off from school social circles affects student’s engagement, which can lead to learning loss.

Learning loss

At an institutional level, both parents and staff regard distance learning as an extremely challenging institutional barrier for them and their children/students. During the pandemic, schools took preventative measures such as sending students and staff home if they exhibited COVID-19-like symptoms, or if they found actual cases or exposures to COVID-19 on campus. As a result, students and staff went through a cycle of in-person and online learning/teaching, leading educators and parents to be concerned about “learning loss” among students. According to focus group participants, this back-and-forth situation was very “disruptive” and “stressful” for the students’ ability to learn, the teachers’ ability to plan, and the parents’ ability to adapt. Parent participants felt ill-equipped to assume the role of teachers at home.

My kid is this five-year-old child that has never used the computer before. So, for her to stay in front of a computer all day is nearly impossible. Well, the school cycle started back in September. We started a week remotely. And for her, it was the first time being really in front of a computer. So, the first couple days was really a pain. I was working at the same time, trying to help her out. And I could see

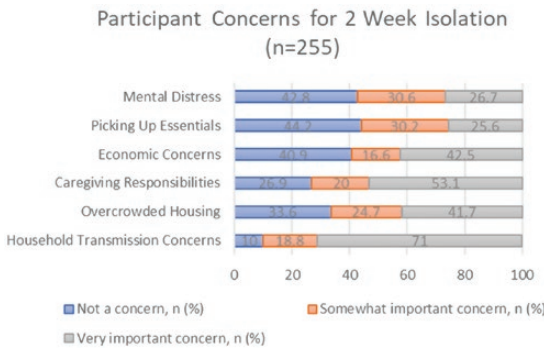


Fig 1 | School staff and parent concerns regarding 2 week isolation period.

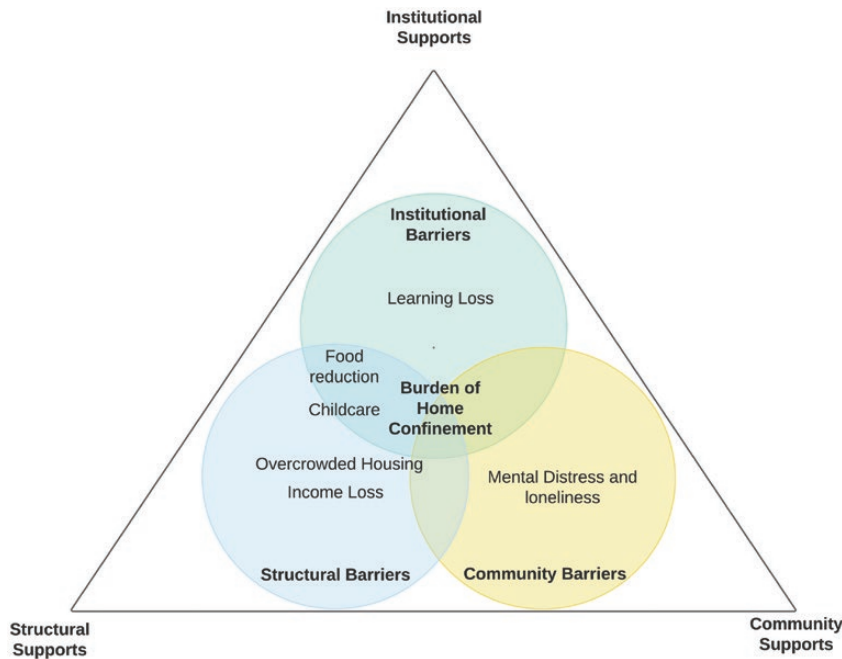


Fig 2 | Conceptual model of barriers and supports derived from themes that emerged from focus group discussions with elementary school and childcare parents and staff.

how she was curious about the computer wanting to click on all the keys and I could hear the teacher. So it was very, very stressful...I think that it's hard for everyone, even for us having to be in meetings. So it gets to a point where you just, it feels like you work double, a double shift, compared to being in person in the office.

-Female Parent

Participants stated that students' attention span had shortened, there were more absences, and general disinterest or disengagement in learning. Participants also described that families lacked quality learning equipment (i.e., Wi-Fi, laptops, headphones) and technical skills (i.e., access to Zoom) which inhibited the students' ability to attend virtual classes.

Childcare

At the institutional and structural levels, lack of childcare is a unique challenge to successful home confinement in the school community. Participants recognize that as an institution, in-person school plays a dual role in facilitating learning and providing families with childcare.

It's a really hard situation for a parent to be in. And I wouldn't want to be that parent who has to struggle and stress out to find somebody to help their kid get online. And I know we're not childcare, but at the end of the day. We are childcare.

-Female Staff

With isolation in place, which usually happened abruptly, families struggled to provide adequate childcare. Congruent with our qualitative findings, over half of survey participants (53.1%) reported that coordinating childcare is a very important concern if they had to quarantine for 2 weeks. The biggest factors that influence families' ability to provide childcare during home confinement were often tied to other structural barriers such as job flexibility, fear of income loss, and childcare affordability. Due to the lack of childcare at home, staff participants noted that many parents normally would send their children to school, even if the child has symptoms.

Parents will sometimes push them [their kids] to school because they're not feeling well, but they want them to be day cared. I see the other side, too, where the kid suddenly has a headache and they're out for two weeks because of 'COVID'.

-Female Staff

Food

Access to food was another issue that crossed both the institutional and structural barriers. About 25% of survey participants felt that picking up essentials such as food or medicine was a very important concern if they had to isolate for 2 weeks. Many participants spoke of the impact of home confinement for families to go out to get basic needs met, most prominently food.

A lot of times they do get food from the school, so I know putting extra lunch every day is a big deal, and then where are they gonna get the food? It's like if they don't have a

family member that can help them, if they have to go to the store, they can't isolate, so I think food is a really big deal and then just money in general.. having to isolate from work. when they don't.. have a job that might not pay for... them to stay home

-Female Staff

Families face two sets of structural challenges relating to food loss during isolation or quarantine: Students who are in isolation no longer have access to school lunches and families cannot access grocery stores.

Income loss

According to participants, one of the most prominent factors that influence parents' choice to isolate or quarantine themselves and their children was whether they could take time off of work and maintain their jobs if they stayed home to watch their children.

So I would think that with adults who are working, if you are told that you were exposed, and you have to self isolate them, that requires 10 days to be off of work? So I think depending on someone's financial situation, they may not want to know that... So, yeah, they would just keep working because they have to.

-Female Parent

Some staff participants highlighted the important linkage between childcare and income loss for parents without job flexibility. The lack of paid sick leave for many working families systematically places an extra burden on those who must go into home confinement. We found that survey participants were split over economic concerns with 42.5% reporting it a very important concern while 40.9% felt it was not a concern.

Overcrowded housing

At the structural level, participants who live in crowded and multigenerational households had difficulty isolating successfully. Participants mentioned the condition and size of the home as a barrier to successful isolation. In this paper, we defined overcrowded housing qualitatively as a condition in which participants perceived that the size of their living space can lead to safety and health concerns to themselves and other members of their household. Of survey participants, 41.7% reported that overcrowded housing was a very important concern during home confinement. Participants explained that complications with isolating young children were often linked to overcrowded housing. In most cases, this struggle to keep exposed children separated manifested in increased health risk for the whole household due to continuous exposure.

It was difficult because my mom, like, I would prepare her food and she would crack open the door. We would be masked. The kids knew that they couldn't come near if I went and knocked on the door. She would only reach out her hand. She would get the food. She would wait until night or if she couldn't wait to go to the bathroom, she would make sure nobody was in the living room. She would go to the bathroom and disinfect everything. It was a very difficult situation for a person to be isolated in their own home with others who don't have symptoms.

-Female Parent

Some parents also voiced concerns about their children getting exposed to COVID-19 by other household members. We found that 71.0% of survey participants believed that household transmission was a very important concern if they had to isolate for 2 weeks.

Comprehensive supports

When asked about how to support parents and staff who had to isolate/quarantine, participants suggested support at the community, institutional, and structural levels. At the community level, some participants advocated for one-on-one counseling and social support groups to create a sense of connection with classmates and fellow parents.

Mental health resources are huge. Online counseling, maybe like a link to a zoom with other people who are in isolation, and they are parents and just need a place to vent to.

-Female Parent

At the institutional level, participants mentioned providing support through schools such as technologies and school materials to attend class virtually and computer technical support. Most participants shared that their schools already provided basic school supplies and technologies such as laptops and Wi-Fi hotspots. However, participants further expanded that computer technical support was needed to improve the virtual learning experience for students and the teaching experience for staff and parents. Additionally, staff participants emphasized that parents needed basic training both in teaching and navigating technology such as using Zoom or a laptop to assist students.

Parents are teachers now too, and parents need so much more support, whether it's parenting classes, heck, maybe even some teaching or teaching management classes

-Female Staff

Many participants believed that schools could play a role in providing food access by continuing food services for students even when they are not physically in class. Some participants mentioned that their schools had certain days of the week where families could pick up food from the school.

I would still say the Friday food backpacks [school food program]. They can still come by and maybe they're outside the office and they're numbered so there's a privacy factor of it and they're numbered and you can just come by and pick it up real quick if you want to. As far as food goes I mean, I like the fact about the centralized food areas but it's still—it's not like they're local school that they're going to. They have to go someplace else and go get it, so it'd be nice if somehow our schools still did it, and I get why they have to centralize. I mean it's just logistics.

-Female Staff

At the structural level, participants felt that food delivery needs to be more robust and easier to navigate in order to respond to the COVID-19 pandemic. Participants felt that governments need to provide substantial financial support and job protection in case of isolation/quarantine.

I think families would need some sort of monetary support. I think that's it. Because if you are asking adults to stay home and not work, because of their children, you have to supplement that lost wage.

-Female Parent

Participants proposed that monetary support and mandated sick leave pay would substantially reduce the burden placed on families while isolating or quarantining.

DISCUSSION

Our findings showed interlocking barriers at the community, institutional, and structural levels that limit parents' agency to quarantine or isolate themselves and their children. We found the separation from the community led to feelings of mental distress and loneliness. Institutional barriers to home confinement include loss of free childcare for parents and limited access to quality learning and free or subsidized school lunches for students. Structural barriers such as income loss and overcrowded housing added another level of burden on those having to isolate or quarantine. Focus group participants advocated for virtual mental health services, school-provided classroom materials, instructional parent-focused workshops for teaching and tech training, and expanded food services, income replacement, and sick leave.

Our findings should be interpreted according to the study design: Because these data were collected as part of a larger environmental monitoring intervention, our findings may be biased towards individuals who were more enthusiastic about COVID-19 prevention in school. Due to ensuring flexibility for participant schedules, we did have some small focus groups ($n = 2$ or $n = 3$). Although very small focus groups (VSFGs) can inhibit inter-participant discussion, according to methodological literature, this does not appear to be the case [31]. VSFGs produce richer data sets by allowing more time for each participant to share their perspective and encourage participants who might typically be excluded or hesitant to engage [32]. Moreover, participation was likely biased towards those with a higher education level when compared to county Census data and those with more reliable internet and technical competency since surveys were conducted online and FGDs were held over Zoom [33]. Due to technical difficulties and the constant flux in schedule changes for our priority population, some participants dropped from FGDs creating circumstances where we ad hoc converted FGDs to In Depth Interviews (IDIs) using a version of the FGD modified to focus on individual experiences.

We found that both staff and parents perceived schools as an institution that plays a dual role in providing education and childcare. The abrupt shift in childcare responsibilities from schools and childcare centers to caregivers, especially female caregivers and caregivers of color, leaves those in essential jobs with few options but to go without pay or risk losing their job altogether [2, 16, 17, 34–36]. Although necessary to reduce risk of COVID-19, home confinement removes the vital resource of free school-based childcare and creates additional financial burdens for caregivers, particularly caregivers who face multiple forms of discrimination [7, 15]. The interwoven nature of income loss and childcare responsibilities highlights the need for policies that comprehensively address this relationship [37].

Consistent with previous studies, our findings show that the disruptive shift between learning formats poses challenges for both students' learning and adults' mental health [38, 39]. Beyond the childcare burden of distance learning, we found that parents felt they were ill-equipped to assume the role of teachers. Parents' new responsibilities of assisting children in navigating school work and technological barriers on top of their existing work obligations may worsen their mental health [2]. Additionally, school staff noted a close association between their mental health and their school duties. For in-person teaching, many school staff expressed concerns about COVID-19 exposure for them and their family members. While teaching virtually, teachers described feelings of helplessness and inadequacy of being unable to fully support their students. Many teachers with children also face the same tensions of home confinement that their students' parents experience. The extra work obligations on parents and educators could translate into increased mental distress and learning loss in children and students [40, 41].

Food insecurity and overcrowded housing are barriers to successful isolation and quarantine that disproportionately harm low-income households [42–45]. Participants emphasized home confinement restricted students from accessing school food services such as subsidized or free lunches, thus shifting the breakfast/lunch meal responsibility from school to home. Among our sites, schools play an important role in providing free/reduced school lunch for over half of the student body [46]. Additionally, there is a strong association between food insecurity and overcrowded housing that home confinement can compound. Food insecurity is higher among renting households, especially low-income households with children [47, 48].

Discrimination and economic inequities limit the ability of women and historically marginalized racial groups to afford adequate housing, which contributes to “hidden homelessness” [49]. Many households face a type of hidden homelessness whereby they must share a common space with another household, creating overcrowded conditions [42, 50–53]. Over 41% of survey participants reported that overcrowded housing was a “very important” concern for them during home confinement, while FGD participants emphasized that isolating with young children was difficult in overcrowded housing settings because caregivers could not separate themselves from their dependents. Understanding how food insecurity and overcrowded housing, along with the other barriers, affect women, and historically marginalized racial groups disproportionately, can help ensure that policies do not leave the most vulnerable behind as new variants of concern arise.

Although home confinement is necessary to mitigate community transmission of COVID-19, we found that it also poses significant burdens to parents and school staff. To limit the harms associated with home confinement, government agencies should provide comprehensive services to overcome community, institutional, and structural barriers. Services should also account for potential gender and racial inequities associated with home confinement. Although gender was not considered in our initial study design for qualitative data, our data showed important gendered implications for home confinement. Future qualitative research around home confinement should include disaggregated data by gender to a design gender-responsive approach to the COVID-19 pandemic [54].

Acknowledgements

We would like to thank parents, guardians, teachers, and school staff for taking the time to share their experiences with us through the community survey and focus group discussions. We would also like to extend our appreciation to the Health and Human Services Agency—County of San Diego for their vision and support of the SASEA project.

Funding

This project was funded the San Diego County Health and Human Services Agency. Additional support was provided by the National Institutes of Health, grants K01MH112436 and U01HD108787.

Compliance with Ethical Standards

Conflicts of Interest: All Authors declare that they have no conflicts of interest.

Human Rights: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent: Informed consent was obtained from all individual participants included in the study. This study received approval from the UC San Diego Human Research Protections Program with Institutional Review Board approval number 201607 prior to inception of research activities.

Welfare of Animals: This article does not contain any studies with animals performed by any of the authors.

Five transparency statements related to: (1) study registration: this study is not a clinical trial was not formally registered. (2) analytic plan registration: the analysis plan was not formally pre-registered. (3) availability of data: de-identified data from this study will be made available upon reasonable request. (4) availability of analytic code: analytic code for quantitative data can be made available upon reasonable request. (5) availability of materials: all materials used to conduct this study will be made available upon reasonable request.

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