ABSTRACT

BACKGROUND: Adjustments in teaching resources and school meal programs are urgently needed during the COVID-19 pandemic. This study examined teaching resources that would have been helpful when schools closed, and how school meal programs should be changed in the 2020-2021 school year.

METHODS: In October 2020, a 27-item, cross-sectional, online survey was administered to 99 teachers and staff members in an urban, Midwestern school district. Data were analyzed using frequencies and proportions, and open-ended responses were analyzed using content analysis.

RESULTS: Online teaching was difficult for teachers and students, and training for online teaching, improved Internet access, and more time for grading or office hours would have been helpful when schools closed. Meal programs were offered by 86% of schools after closing, and many participants supported continuing meal programs for 2020-2021. Resources needed to continue meal programs included funding for meal reimbursement, transportation to the meal sites, and more staff. Suggested changes to meal programs included offering more variety or more food, and solving transportation issues.

CONCLUSION: Addressing these concerns can improve school and community health. Findings will inform efforts to enhance online teaching and improve and continue school meal programs as the world continues to be affected by COVID-19.

Keywords: school meals; COVID-19; teacher resources; school food services; online teaching; coronavirus.

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communities. To examine this, the Health Promoting Schools framework was used, which emphasizes the interplay between education, curriculum, and the surrounding community for promoting health.⁸

Therefore, an understanding for how to improve school responses to large-scale events like COVID-19, including resources needed by teachers for education adaptations and meal programs is warranted. The purpose of this study was to examine teachers’ perceived teaching needs as a result of COVID-19, and teachers’ and other staff members’ perceived resources needed for meal programs for the 2020-2021 school year. Information from this study can be used to better prepare for future pandemics or large-scale disruptive events, and can inform future school policies.

METHODS

Participants
The fifth largest Kansas public school district located in urban Kansas City, Kansas comprised of 29 elementary, 7 middle, and 4 high schools and over 22,000 students including 50% Hispanics, 29% African Americans, 11% Whites, and 7% Asians was recruited for the study.⁹ The county has 73% of students eligible for free or reduced-price meals,¹⁰ and the district has 1622 teachers and 4420 staff members, including 207 food service staff (email communication, D. Tuggle, November 2020). All teachers and staff members for the school district were eligible to participate. An electronic, cross-sectional survey link was emailed in October 2020, to the school district’s director of nutritional services, who forwarded it to school district staff. All participants who completed the study received a $20 electronic gift card.

Instrumentation
The survey was developed using Research Electronic Data Capture.¹¹ The survey instrument included 27 total questions with skip patterns, and took 5-10 minutes to complete. Questions were divided into 3 sections—demographics, school and teaching resources, and school meal programs. Demographics questions include: occupation, sex, age, race/ethnicity, and health status, and teachers were also asked their years of teaching experience and grade level taught. Questions on school and teaching included: Is your school open for 2020-2021 in-person only, online only, in-person and online, no, or not sure; in what ways has COVID-19 affected your teaching, which allowed open-ended responses; and what resources would have been helpful when your school closed due to COVID-19, which used a select all that apply option with 16 choices. Questions on school meal programs included: Did your school offer meal programs after closing yes, no, or I do not know, and if so, which meals from lunch, breakfast, afterschool, or other; what should be changed or continued about the school meal programs, which allowed open-ended responses; will your school offer meal programs in 2020-2021 yes, no, or I do not know, and if so, which meals from lunch, breakfast, afterschool, or other; and what resources are needed to help ensure the meal programs are offered in 2020-2021, which used a select all that apply option with 13 choices. Only teachers received questions related to teaching. Four teachers from 2 neighboring school districts pretested the survey and offered wording or answer response suggestions. Data analyses were conducted in SPSS (version 26, IBM Corp., Armonk, NY) using descriptive statistics. The 2 open-ended questions were analyzed using content analysis to identify patterns and themes. Both authors independently reviewed the open-ended data and mutually agreed upon the patterns and themes presented here.

RESULTS

Limited resources restricted recruitment to the first 99 participants. Sample demographics are displayed in Table 1. Briefly, the majority of participants were women, either a food service staff member (N = 47; 48%), administrator (N = 19; 19%), or teacher (N = 17; 17%), and either white (N = 45; 46%), black (N = 35; 35%), or Hispanic (N = 13; 13%). Among all participants, 74 (75%) reported that for the 2020-2021 school year their school was open for online classes only; 2 (2%) reported being open for in-person classes only; 11 (11%) reported their school was open for a combination of in-person and online classes; 8 (8%) reported their school was not open; and 4 (4%) were not sure.

Teaching Needs
A total of 17 teachers completed the survey. When asked what resources would have been helpful when schools closed due to COVID-19, the most frequent responses were: training for online course instruction and/or curriculum development (N = 15); improved Internet access and/or mobile Internet capabilities (N = 14); more time allotted for grading or office hours (N = 12); computer accessories (N = 9); and online attendance or participation tracker (N = 9).

Teachers were asked about ways their teaching was affected by COVID-19. Table 2 shows themes of their responses with representative quotes. A main overarching theme reported by teachers was the difficulty in online teaching for both teachers and students, including difficult communication and inability to help students when teaching online. Only 2 teachers noted that using technology enhanced their teaching.
Table 1. Participant Demographic Characteristics of School District Teachers and Staff

| Variable                        | N, %    |
|---------------------------------|---------|
| Sex                             |         |
| Women                           | 92 (93%)|
| Men                             | 7 (7%)  |
| Mean age (SD)                   | 44 years (12.2) |
| Position                        |         |
| Teacher                         | 17 (17%)|
| Nurse                           | 2 (2%)  |
| Food Service staff              | 47 (48%)|
| Other staff                     | 9 (9%)  |
| Administrator                   | 19 (19%)|
| Other                           | 4 (4%)  |
| Race/ethnicity                  |         |
| White                           | 45 (46%)|
| Black                           | 35 (35%)|
| Hispanic                        | 13 (13%)|
| Native American                 | 1 (1%)  |
| Other                           | 1 (1%)  |
| Multiple                        | 3 (3%)  |
| Health status                   |         |
| Excellent                       | 13 (13%)|
| Very good                       | 26 (26%)|
| Good                            | 48 (49%)|
| Fair                            | 12 (12%)|
| Grade taught (teachers only)    |         |
| 1st                             | 1 (1%)  |
| 2nd                             | 2 (2%)  |
| 3rd                             | 2 (2%)  |
| 4th                             | 2 (2%)  |
| 5th                             | 2 (2%)  |
| 6th                             | 4 (4%)  |
| 7th                             | 5 (5%)  |
| 8th                             | 5 (5%)  |
| 9th                             | 5 (5%)  |
| Years of experience teaching    |         |
| Mean (SD)                       | 8.3 years (9.5) |

School Meal Plans

All participants were asked if their school continued meal programs after closing due to COVID-19, and 86 participants reported yes, 8 participants reported no, and 5 did not know. Of those reporting their school continued meal programs, 83 (97%) offered lunch and 73 (85%) offered breakfast.

All participants were also asked what resources were needed to ensure meal programs would be offered during the 2020-2021 school year. The most frequent responses were: more funding for meal reimbursement (N = 64); transportation for students who lack it (N = 58); more staff (N = 37); support from state government (N = 36); and support from local government (N = 34).

Lastly, all participants were asked what should be changed or continued regarding the meal programs. Themes and representative quotes are in Table 3. Main themes were that the program is going well and should continue (N = 17); a greater variety of food items, including more total food items was needed (N = 12); and transportation issues should be addressed (N = 11). The transportation issues mentioned include the need for delivery to families in schools that did not offer that already, and making meals more accessible for those who lack transportation.

**DISCUSSION**

This study examined resources needed for improving education and meal programs by urban teachers and school staff during the COVID-19 period. Findings can be used to enhance education efforts, advocate for continued provision of school meal programs, inform and strengthen school food policies, and overcome barriers to effective meal program participation.

Online learning creates many challenges ranging from technology, content, and communication issues. Educational systems must be effective and efficient for high-quality distance education. Teachers indicated the main resources that would have been helpful when schools closed were training for online course instruction and/or curriculum development and improved Internet access. Others have noted the immediate technology challenges for students. Given the disparities in Internet access, this is a critical area to address as the COVID-19 pandemic continues globally. Potential solutions include school districts providing technological devices for students, offering Wi-Fi hotspots, or offering corporate discounts on Wi-Fi packages. Others have noted that schools investing in computer technology and support, and teacher training can be critical factors in the transition to online education. Research should examine best strategies for training teachers in online learning and local planning for high-quality Internet access for all students in the school district.

Overall, 86% of participants indicated that their school continued to offer meal programs during the COVID-19 closure, similar to a nationally representative survey that found 82% of public schools offered meals during school closures. Access to healthy and affordable food should be a critical component of COVID-19 responses, including maintaining provision of school meals, ensuring food markets remain designated as essential services, and keeping them functional and safe. It is encouraging that many participants in this study indicated support for the continuation of their school district meal program.

Participants indicated more funding, staff, and government support is needed to ensure the school meal programs continue. The US Department of Agriculture, under authority of the Families First Coronavirus Act, has issued nationwide waivers for school meal programs and loosened restrictions that meals be served in group settings and at specific times of the day. It allows schools and districts to adopt and develop innovation approach to improve school meal delivery.
Table 2. Themes of Open-Ended Responses (N = 17) and Representative Quotes From Teachers Regarding How COVID-19 Affected Their Teaching

| Theme (# quotes)                        | Representative Quote                                                                                                                                                                                                 | Participant(s)       | Details |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|---------|
| Online teaching is difficult (6)       | “It has made very difficult to keep up with everything in general...”                                                                                                                                                | White female, teacher grade 6 |
| Hard to communicate and interact with students (5) | “Using Zoom has been helpful, but I cannot see my students face. The district is not requiring students to expose themselves. They are respecting each student privacy from home.” | Black female, teacher grades 7-9 |         |
| Difficulty engaging students (5)       | “I cannot tell if my students are participating or not.”                                                                                                                                                              | Black female, teacher grades 7-9 |
| Hard to help students or be effective (3) | “Teaching through Zoom makes it hard to for teachers to... give one on one help to students when they are struggling.”                                                                                          | White male, teacher grade 8 |
| Internet access and technology issues (3) | “Many students do not have reliable Internet,”; “Switching to virtual has made my teaching better because I can use technology to enhance my lessons.”                                                        | White female, teacher grades 7-9 |

Table 3. Themes of Open-Ended Responses (N = 60) and Representative Quotes From School Staff Members Regarding What is Needed to Continue School Meal Programs for the 2020-2021 School Year

| Theme (# quotes)                        | Representative Quote                                                                                                                                                                                                 | Participant(s)       | Details |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|---------|
| Program is going well and should continue (17) | “This system has worked out very well and I think the families appreciate the help.”                                                                                                                               | Black female, food service staff |
| Greater selection and variety, or more food offered (12) | “Feedback from families has indicated that they would like a better selection of foods offered,”; “I think that they should offer a little bit more food. I do not think the kids are getting full;”, “More options for students with diet restrictions.”; “Providing more hot meals that can be heated at home.” | White female, teacher; Black female, food service staff; Black female, food service staff; Black female, teacher |
| Transportation issues (11)            | “Deliveries to homes/centers should be implemented to assist with families without transportation and/or if parents/guardians are at work during the day.”                                                | Black female, administrator |
| Need more locations (6)               | “They should be offered at all schools locations, not just a select few.”                                                                                                                                             | Black female, administrator |
| Meals offered more frequently or at better times (6) | “We should offer different hours to pick up food at certain locations instead of having food available from 11 am to 2 pm at every location. Many parents cannot pick up food until after work. Some locations should have food available for pick up from 4 to 6 p.m.” | White female, teacher |
| Need better communication and ability to participate (3) | “I know that filling the application might be crucial but some of our families do not know how to do it on line or even do it by phone so they do not have access to the meal program.” | Hispanic female, teacher |
| More training, funding, and safety (3) | More training and social distancing; “At this point, just need my staff to safe and healthy. Wear mask everybody.”                                                                                                    | Black female, food service staff; Black female, food service staff |
| Free or reduced costs (2)              | “It should be free to all families and families should not have to register to get a free meal.”                                                                                                                     | Black female, other staff member |

Beginning in April 2020, the school district in this study offered lunch and breakfast pickup at 6 locations during the hours from 11:00 am to 2:00 pm on Mondays, Wednesdays, and Fridays. Families lacking transportation or access to a meal pickup location, and having to sign up to participate in the school meal program were noted by multiple participants in this study as potential barriers to participating. There is an urgent need to determine how best to mitigate those concerns and ensure equitable access for school meal access. Potential strategies used by others that could overcome these challenges and reduce the burden for the families include centralizing meal delivery sites or along school bus routes; home delivery; expansion to offering meals 7 days per week; backpack programs providing shelf-stable foods; and allowing meals to be preordered online or by phone. These changes require schools or school districts to adjust procurement, preparation, and distribution techniques.

School meals significantly contribute to students’ daily dietary intake especially for children from low-income families. Staffing challenges, such as increased demands on meal outputs and fear of exposure to COVID-19, are widespread. One potential solution to increased staff needs is creating a crew of backup workers.
reduced access to school meals for many students who rely on them to meet their nutritional needs. Therefore, it is important to increase access to nutritious meals and healthy food options. Participants in this study reported a need to enhance the variety of foods offered in school meal programs. Others have noted concerns about variety of foods offered in COVID-19 school meal programs. Addressing this issue could enhance congruence with the current dietary guidelines for Americans, which emphasizes variety in the diet.

Limitations

This observational study is limited by the sample size due to restricted resources, and results may not be generalizable to other geographic regions or suburban or rural school districts. However, the sample was diverse and included the perspectives of staff members in a variety of positions in one urban school district. The cross-sectional nature of the data limits any causal inferences, but findings do highlight potential areas to examine more in-depth; in particular, this includes online teaching training and access, and the need to continue meal programs while addressing transportation issues and variety of foods offered.

IMPLICATIONS FOR SCHOOL HEALTH AND EQUITY

The pandemic has cast a spotlight on the vital role of school meals and nutrition programs in meeting the nutritional needs and reducing the food insecurity. During the 2018-2019 school year, almost 5 billion lunches were served to 29.6 million children, and 2.5 billion breakfasts were served to 14.8 million children, demonstrating the enormous reach of federal nutrition assistance programs. More locally, Kinsey et al. report that in the 9-week period between March 2 and May 1, approximately 10 million free and reduced-price school meals (breakfast and lunch) were “missed,” or not delivered, in Kansas. Given that participants in school meal programs are more worried about losing access to food than those not participating, there is a critical need to continue offering school meal programs during this pandemic and ensure future meals are not missed during the remainder of this school year and into 2021. Results of this study indicate support for using the Health Promoting Schools framework to guide the study of health promotion in schools, particularly in regards to meal programs, which serve as an important community resource.

The COVID-19 pandemic has made clear that schools are an enormous resource for children, families, and communities, and has provided an opportunity for schools to pave the way in adapting to the needs of those they serve. Furthermore, knowing the heightened role that schools play in communities in this unprecedented time, school administrators, teachers, and staff should solicit local, state, and national assistance to mitigate the adverse effects of COVID-19, particularly as it relates to online education and flexible meal programs.

Preparing teachers for online education and improving Internet access where needed will be important to consider moving forward, and school district administrators should take steps to address these as appropriate. This could include providing expanded Internet access to teachers and students, working with local government officials and Internet providers to expand mobile Internet coverage, and providing online education training, including offering substitute teaching coverage if needed while completing such training. Schools offering online instruction would benefit from assessing the reliability of parents’ and caregivers’ Internet connections.

Furthermore, school meals programs play a critical role in the health and nutritional needs of children, including for mitigating the growing food insecurity crisis. With schools across the US shutting down again amid COVID-19 outbreaks among students or staff, there is an urgent need for schools to be prepared for that possibility for the remainder of the 2021 school year. In the event of closures, schools should adapt their school meal programs, such as by increasing school and community food pantries and meal pickup locations, offering transportation services to or from meal pickup locations, offering meal ordering, and hiring additional staff. Additional school and health implications include heightened attention on safety in food service operations, particularly as it relates to slowing communicable diseases like COVID-19.

Human Subjects Approval Statement

The authors of this study received approval from the school district director of nutritional services and the University of Missouri-Kansas City Institutional Review Board to publish this anonymous survey data. IRB reference number 269034.

Conflict of Interest

All authors of this article declare they have no conflicts of interest.

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