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Challenges and Successes for School Child Nutrition Directors During the COVID-19 Pandemic: A Mixed-Methods Study

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KEYWORDS: COVID-19, pandemic, resilience, mixed methods

INTRODUCTION:

During the COVID-19 pandemic (COVID-19), in-person services at public schools were paused nationwide for more than six months, hindering the provision and access to school meals. Annually, 4.9 billion lunches and 2.49 billion breakfasts are served through the National School Lunch (NSLP) and School Breakfast Programs (SBP) to school-age children in the U.S. (Food and Nutrition Service, 2024). The number of missed school meals due to school closures surpassed 169.6 million by early May 2020 (Kinsey et al., 2020). States with some of the highest food insecurity rates in 2020, such as Mississippi (MS) at 15.3%, Louisiana (LA) at 14.8%, and West Virginia (WV) at 15.1%, also witnessed an increase in missed number of free and reduced-price meals (Coleman-Jensen et al., 2021; Hake et al., 2020; Kinsey et al., 2020). In response, the USDA issued Child Nutrition COVID-19 waivers to allow greater meal availability, increased distribution times, and eased eligibility regulations (Kinsey et al., 2020; Soldavini et al., 2021).

The NSLP and SBP play an essential role in addressing food insecurity among children. Therefore, it is important to understand how Child Nutrition Directors (CNDs) can best manage future disasters through their resilience in overcoming crises such as COVID-19. Resilience is understood as the ability of a social system to endure and adapt to shocks without the development of long-lasting consequences (Berkes & Ross, 2013; Cafer et al., 2019; Constas et al., 2014).

A resilient pathway is one where relevant action is taken by the members of the social system to sustain operations during challenging and potentially catastrophic circumstances, such as the COVID-19 pandemic (Béné, 2020; WFP, 2014). It should be noted that resilience is a dynamic concept that changes with time and the type of event (Cutter et al., 2008). Many stressors accompany an event of shock, for example, the depletion of resources, loss of staff and workforce, and conflicts (Berkes & Ross, 2013). The literature on resilience also explores the strengths of a social system that allows for a collective and strategic response that provides sustained operations. For example, researchers have identified advancements that need to take place because of adverse circumstances, such as knowledge networks, technological capacity, infrastructure, and values and beliefs (Berkes & Ross, 2013). These existing strengths and responsive advancements are examples of the

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adaptive capacity of a community (Cutter et al., 2008; Engle, 2011). A ripple effect phenomenon occurs among the actors of resilience where the impact and the response of one actor essentially impacts and determines the response of the other actors (Béné, 2020). Resilience capacity is composed of (1) absorptive capacity, the capacity to absorb (persistence) shock and stress; (2) adaptive capacity, the capacity to adapt (incremental adjustment) to shock and stress; and 3) transformative capacity, the capacity to transform (change) in the face of shocks and stressors (Constas et al., 2014; TANGO International, 2018a). The analytical model for measuring resilience capacity defines six analytical elements of resilience measurement (Constas et al., 2014). The events that affect the normal functioning of the impacted population are called stressor events (Constas et al., 2014; TANGO International, 2018a).

A conceptual resilience capacity model (RC Model) (Figure 1) defines resilience capacity in the context of school meal programs and is composed of the following actions:

a) ***Absorptive capacity***: the capacity to *absorb (persistence)* shock and stressors, which refers to the ability of school meal programs to adapt and continue providing food to students despite the pandemic.
b) ***Adaptive capacity***: strategies used to *adapt (incremental adjustment)* to shock and stressors based on experiences. This involves modifying existing structures, processes, and services to ensure the continuity and effectiveness of these services in the face of shock and stressors.
c) ***Transformative capacity***: strategies used to *transform (change)* in the face of shocks and stressors; refers to the ability of school meal programs to undergo significant changes in their structures, processes, and services in response to external shocks. This involves fundamentally altering how services are provided to better address emerging challenges and needs for continued meal distribution.

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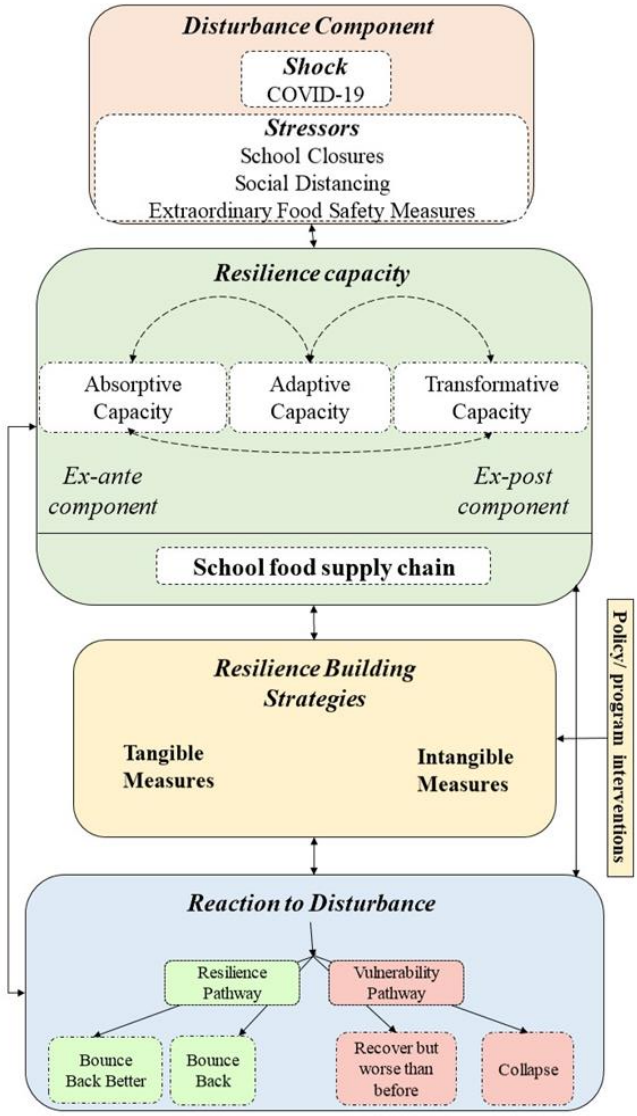
Figure 1. *Modified conceptual resilience capacity model used to understand challenges and mitigation strategies used by Child Nutrition Directors during the COVID-19 pandemic (Berkes & Ross, 2013; Cafer et al., 2019; Constas et al., 2014; Zviedrite et al., 2021)*



The first step in applying the RC Model is to identify the shock (COVID-19) and then the stressors (occurrences that cause the need to implement change through adaptive and transformative strategies). Guided by the RC Model, this research aimed to identify the stressors and examine the adaptive and transformative strategies used by CNDs in southeastern U.S. school districts to sustain safe school meal services during COVID-19 (spring 2020 to spring 2021).

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MATERIALS AND METHODS:

Study Design, Research Context, Population

Study Design: This exploratory sequential mixed methods study, guided by an RC Model, utilized focus groups and surveys (Doyle et al., 2016). Focus groups were conducted with CNDs from Mississippi (MS), Louisiana (LA), and West Virginia (WV), as these states had the highest rates of food insecurity in 2020 (Coleman-Jensen et al., 2021). Based on these data, a survey was developed to gain a further understanding of the challenges faced by CNDs during COVID-19.

Focus Group Participants: Emails were sent to all CNDs in school districts of MS (n = 169), LA (n = 76), and WV (n = 56) in spring 2021. Twenty-one individuals expressed interest in participating in a focus group discussion. Four focus groups (3–6 participants per focus group, total n=16) were held virtually via Zoom for 50–60 minutes between March–August 2021. Each focus group was moderated by the same primary researcher, senior researcher, and two undergraduate research assistants to provide additional notes.

Survey: Based on findings from focus groups, the survey was developed in Qualtrics and emailed to all CNDs in MS (n = 169), LA (n = 76), and WV (n = 56) in January 2022, with two reminders sent one week apart. Of 301 CNDs, 47 survey responses were received, with five unusable incomplete survey responses, yielding a total response rate of 42 (14%). General district-level demographics were determined for 39 districts, as three CNDs did not provide district names. The study protocol was deemed exempt by [blinded for review] Institutional Review Board under federal regulation 45 46.101 (b)(#2).

Data Collection

Focus Groups Discussion Guide:

A discussion guide was developed based on the RC Model (Figure 1) to guide the focus group discussions. Race and ethnicity, gender, and age information for CNDs were not collected for anonymity. Content validation of the question guide was completed by two Institute of Child Nutrition (ICN) staff members and two CNDs in MS. For face validation, the discussion guide was tested by one focus group and yielded responses relevant to exploring the adaptive and transformative strategies used by CNDs during COVID-19 and the challenges they faced (Amore et al., 2019).

Survey Development

Step 1: Preliminary questions were developed by researchers based on focus group findings and guided by the RC Model. Questions were reviewed until all authors agreed on the final survey questions.

Step 2: The questions were assessed by seven subject experts in school nutrition and survey development, who were provided with the study aims, objectives, a brief description of the study, and the procedures for a collective assessment of the questions (Dilorio, 2005). For content validity, all individuals provided a score for

content relevancy on a scale of 1 (not relevant) to 4 (very relevant) and clarity on a scale of 1 (not clear) to 4 (very clear) (Zamanzadeh et al. 2015).

Step 3: A small convenience sample (n = 5) was used to determine the face validity using participants' and experts' suggestions (Uggioni & Salay, 2013). The feedback was incorporated into the final survey.

CND participants responded to the questions in reference to school meals offered during the time frames of spring 2020, summer 2020, fall 2020, and spring 2021. The survey included seven modules. Modules and number of questions included were as follows: meal program operations (9), types of foods distributed (4), provision methods (11), food storage space (6), safety measures (13), and changes in employment (7). An additional section, called encouraging outcomes, asked CNDs about positive impacts from COVID-19 (6), one section included CND education and experience level (5), and one open-ended question was included. General district-level information was determined based on school district names. Item-wise content validity index (CVI) for all the 62 items was calculated (Uggioni & Salay, 2013; Vanover et al., 2021; Zamanzadeh et al., 2015).

Data Analysis

Focus Groups

Audio-visual recordings of focus groups were transcribed using the transcription function of Zoom version 5.7.0 (Zoom Video Communications, Inc.) and Otter.ai version 2021 (Otter.ai) software packages. A combination of inductive and deductive coding was used and guided by the RC Model (Vanover et al., 2021). Coding was completed by the primary researcher and three trained undergraduate researchers. Saturation was reached based on the repetition of codes found, and no new codes were identified. Subthemes were identified by further analyzing the data within each major theme, highlighting specific patterns and nuances (Saldaña, 2014; Vaismoradi et al., 2013). The final codebook included both themes and their subthemes to guide the interpretation of the findings.

Survey

Descriptive statistics were performed in SPSS (Released 2020. IBM SPSS Statistics for Windows, Version 27.0. Armonk, NY: IBM Corp) and were used to report the adaptive and transformative strategies used to address barriers and challenges faced by the CNDs.

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RESULTS AND DISCUSSION:

Demographics

Sixteen CNDs from school districts in MS, LA, and WV participated in focus groups. The survey participants included 28 from MS, 10 from LA, and four from WV. Based on guidelines established by the Institute of Child Nutrition, 19 districts were small (< 2,800 students), with 18 medium (2,800–30,000 students) and two large (> 30,000 students) (Institute of Child Nutrition, 2021). Most districts were rural (17), and the remaining were categorized as town (9), suburb (9), and city (4). Poverty levels ranged from 9.3% to 57.3%. Three districts were below the 2022 national poverty level of 11.5% (US Census Bureau, 2023). Characteristics showed 15 CNDs with associate or bachelor's degrees, 24 with master's degrees, one with a doctorate, and two not reporting. Eight participants had 3–5 years of experience in child nutrition, 11 had 5–10 years, and 23 had over 10 years.

Focus Groups

All CNDs participated in responding to all focus group questions. Themes were identified and categorized by (a) stressor impacts, (b) adaptive strategies and transformative strategies, and (c) encouraging outcomes that were described as a result of COVID-19. Each overarching theme was divided into subthemes. The frequency of occurring subthemes is expressed as a frequency percentage of their assigned overarching theme (Table 1). Table 2 shows the impact of COVID-19 on school meal operations during Spring 2020, Summer 2020, Fall 2020, and Spring 2021, as reported by CNDs.

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Table 1. *Thematic Analysis of the Focus Group Discussions Carried Out with Child Nutrition Directors (n=16) from Mississippi, Louisiana, and West Virginia.*

Theme[a]	Subtheme	Frequency (%)[b]	Exemplifying Quote
Disturbance: *Stressors During the COVID-19 Pandemic*			
Securing Food	Food accessibility	18.7	*"But that higher cost on all those packaging, supplies, ended up costing us a lot also."* (Participant #1)
	Food availability	81.2	*"We're having to order milk, two weeks in advance now, because the milk companies manufacturing is down, and the dates aren't lasting as long. We used to be able to order and have milk that would last a week and a half so we wouldn't have to receive milk deliveries during spring break. Well, this year that's not the case because our milk is only lasting, you know, about five days out."* (Participant #14)
Workforce	Reduced participation	18.9	*"So, as much as I advertised, as much as I remind them and send out, "hey it everybody free, come get it", there are some parents that don't trust anything outside of their home"* (Participant #1)
	Staff challenges	81.8	*"…and to make it easier on our staff, especially if we have multiple people out quarantining, then it's harder to make six entrees, it's easier to prep two [because of reduced number of employees] …"* (Participant #1) *"…And I'd say the biggest issue or the, the most labor-intensive issue was cleaning up while children are eating in the classroom, naturally there's going to be spills…"* (Participant #4) *"You've got to also look at the money too, we're [either] able to keep our employees or we're able to give our employees raises or we're able to get the equipment that we do need."* Participant #7)

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Theme[a]	Subtheme	Frequency (%)[b]	Exemplifying Quote
Food Storage	Storage availability	66.7	*"As far as storage goes, the to go trays are a lot bigger boxes and we, since we weren't feeding in the cafeteria, we were able to use one wall just for to go trays getting those in."* (Participant #1)
	Storage equipment	13.3	*"But then on the other hand we had to kind of figure out what to use, because we had limited storage."* (Participant #12)
	Menu changes	20.0	*But, you know, we had to get creative with our menus because we had to get some of that stock down because with commodities, we were going to get more commodities whether we use those or not.* (Participant #15)
Resilience Capacity: *Adaptive Capacity Strategies*			
Employee and Child Safety	Safety measures	66.7	*"Being that they were eating in the classrooms, I converted some of my dining rooms to prep areas, made sure everybody was six feet apart, redid the work schedule to where we didn't cross paths"* (Participant #1) *"They were able to space out in the cafeteria sitting on one side of the table because we had the tables that break apart. But two kids were sitting on one side of the table six feet apart and they were able to actually sit in the cafeteria and eat."* (Participant #8) *"Our folks were always masked, always wearing gloves."* (Participant #4)
	Training	33.3	*"Training properly so no one gets hurt and switching it up on the fly by also following the safety standards, allowed us to be more versatile."* (Participant #4)
Food Distribution	Distribution methods	22.8	*"We started feeding lunch in the classroom. So, you know, we hauled lunch down [to the] kids, we call that room service on wheels served with love."* (Participant #3) *"...we went to like the [fast food restaurant] model, because that's what it looked like we, we instantly ordered cones and safety gear, and we would*

Theme[a]	Subtheme	Frequency (%)[b]	Exemplifying Quote
			not allow anybody in our buildings per se, but we were running car rider lines through our parking lots…" (Participant #4)
	Changes in menu and food preparation	38.6	*"We're still serving things like fresh produce and perishable items like yogurt. Those are easy things that you can package for a grab and go option and then we still have a main hot entree, and we've been able to really use our commodities as well, so they're still scratched, you know, made from scratch items"* (Participant #2)
	New resources	21.1	*"…program came out. So, we switched to that and so we ended up moving to a food company that did prepare the boxes frozen and shelf stable, but we only paid for boxes that they distributed, and we did it at four sites so that worked out much better. We continued that throughout the entire school year."* (Participant #1)
			"We did use [company name]. The positive was that it was great food. We loved it. The negatives were [that] it was very expensive" (Participant #9)
	USDA waivers	17.5	*"…breakfast and lunch together which was a waiver of the USDA which made operations much easier for parents and guardians… they could simply pick up both meals."* (Participant #12)
			"I just hope that USDA will continue to allow schools to make those decisions and adapt based on what those schools need with, with National School Lunch Program" (Participant #13)
Workforce Changes	Communication	36.4	*"We are 'small-town USA' and have always done a great job banding together in times of need; our network was strengthened during this time, and it is how we pulled off the impossible!"* (Participant #10)

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Theme[a]	Subtheme	Frequency (%)[b]	Exemplifying Quote
	Volunteers	63.6	*"So, all of a sudden, our bus drivers, our maintenance workers, people within the schools came out to help. And it really let me get to know my other departments a whole lot better."* (Participant #3) *"When the pandemic hit, not only did they [child nutrition staff] provide food, but they also provided connections, a friendly face (from mask up!)"* (Participant #12)
Resilience Capacity: *Transformative Capacity Building Strategies*			
	Documentation	15.8	*"We are doing a big push to get everyone to still apply for free and reduced lunch, because we have a lot of angry parents who did not apply for free and reduced lunch because it was free"* (Participant #9) *"I think, tracking and documenting and why you made the decisions you did. And then going back and adjusting your plan to what worked, what didn't work and documenting the different things that happened through the process like there were some things that I forecasted, or thought was a great idea and then once it played out is like, yeah, this is not a, this is not working well at all."* (Participant #1) *"for child nutrition, it is better to be proactive than reactive"* (Participant #13)
	Training	18.4	*"[need] to incorporate a communicable disease or virus standard operating procedures into the HACCP [Hazard analysis and critical control points] plan or into the school safety plan"* (Participant #3) *" I think that officers, directors, along with our school staff need training in emergency management situations. And in essence, I think that the full-service program specifically needed enhancements with the*

Theme[a]	Subtheme	Frequency (%)[b]	Exemplifying Quote
			sanitation, with how to feed from one with, within one situation to another one." (Participant #12) *"Never take anything lightly when it comes to sanitation. Train, retrain, and train again."* (Participant #15)
Encouraging Outcomes			
	Teamwork	50.0	*"So, while all the teachers and all the principals and everybody else were at home, [those who were] working were our essential cafeteria employees. We ran every single location. All 23 locations ran."* (Participant #4) *"We used to be considered the destruction of the day, and now it seemed like it was the, the most vital part of the day, whether it was serving them breakfast and lunch in the classroom because they couldn't social distance in the cafeteria, or if it was packing up these daily meals and going out on the buses to make their daily runs."* (Participant #7) *"Like we were able, and I think every county district in the United States Child Nutrition came strong. I mean, we were able to pivot, we were able to get our jobs done."* (Participant #14)
	Recognition of child nutrition programs	50.0	*"…but really that silver lining is [that] it kind of elevated our department and showed everyone that you know how important child nutrition is. It's not an afterthought. It's not just a forgotten support service, but that it really is needed by our kids […] and I'm grateful for it. I think it was, you know, kind of a blessing in disguise in the midst of this crazy pandemic"* (Participant #2)

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Table 2. *Survey Results of the COVID-19 Pandemic Impact on School Meal Program Operations and Safety Efforts Put in Place by Child Nutrition Directors (N=47)*

Survey Items	Spring 2020 *n* (%)	Summer 2020 *n* (%)	Fall 2020 *n* (%)	Spring 2021 *n* (%)
Disturbance: *Stressors During the COVID-19 Pandemic*				
Financial losses	32 (76.2)	23 (54.8)	28 (66.7)	22 (52.4)
Reduced school meal participation	35 (83.3)	27 (64.3)	32 (76.2)	26 (61.9)
Reduced availability of food products	19 (45.2)	14 (33.3)	30 (71.4)	37 (88.1)
Reduced availability of supplies related to meal preparation and distribution	21 (50.0)	15 (35.7)	32 (76.2)	40 (95.2)
Additional COVID-19 protocols and food safety practices to be established for employees to ensure serving safe food	37 (88.1)	31 (73.8)	40 (95.2)	40 (95.2)
Constant changes in guidance regarding COVID-19-related safety	21 (50.0)	19 (45.2)	21 (50.0)	23 (54.8)
School meal program staff shortages	27 (64.3)	19 (45.2)	35 (83.3)	37 (88.1)
Challenges to providing planned menus because of either staff or shortage or food supply chain shortage	23 (54.8)	16 (38.1)	32 (76.2)	40 (95.2)
Challenges to meet reimbursable meal requirements	22 (52.4)	19 (45.2)	28 (66.7)	35 (83.3)
Resilience Capacity: *Adaptive Capacity Strategies*				
More frequent cleaning/sanitation	35 (83.3)	31 (73.8)	37 (88.1)	35 (83.3)
Discontinuing use of self-service stations or bars (i.e., salad/condiment bars)	29 (69.1)	20 (47.6)	28 (66.7)	26 (61.9)
Enforcing social distance where meals are consumed (e.g., spacing tables 6 feet apart)	26 (61.9)	20 (47.6)	35 (83.3)	31 (73.8)
Providing and/or requiring masks for students	26 (61.9)	21 (50.0)	38 (90.5)	34 (80.9)

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Survey Items	Spring 2020 *n* (%)	Summer 2020 *n* (%)	Fall 2020 *n* (%)	Spring 2021 *n* (%)
Requiring students to wash hands/use hand sanitizer prior to meal service	24 (57.1)	18 (42.9)	35 (83.3)	32 (76.2)
Enforcing social distance during meal pick-up/selection	28 (66.7)	21 (50.0)	32 (76.2)	30 (71.4)
Serving pre-plated/packaged meals	30 (71.4)	26 (61.9)	25 (59.5)	24 (57.1)
Utilizing touchless payment/counting/claiming systems	27 (64.3)	20 (47.6)	29 (69.1)	28 (66.7)
Having students eat meals in the classroom	18 (42.9)	11 (26.2)	36 (85.7)	31 (73.8)
Installing physical barriers and/or sneeze guards	15 (35.7)	11 (26.2)	26 (61.9)	25 (59.5)
Spreading out meal preparation/packaging stations	20 (47.6)	18 (42.9)	22 (52.4)	18 (42.7)
Limiting the number of staff members at preparation/distribution locations	21 (50.0)	20 (47.6)	15 (35.7)	14 (33.3)
Rotating staff schedules/assignments to limit exposure	11 (26.2)	10 (23.8)	9 (21.4)	7 (16.7)

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Stressor Impacts of COVID-19 on School Meal Programs

Stressors are occurrences that cause the need to implement change through adaptive and transformative strategies. Following is a description of the three main stressors identified in this research.

Challenges Securing Food

Food accessibility and food availability were major concerns during COVID-19. Contributing factors included limited food supplies, rising costs of food products, and panic buying (Tables 1–2). Additionally, the cost spike for food products, food packaging supplies, food distribution supplies, and food safety equipment compromised school meal operations.

Workforce Challenges

Child nutrition programs faced understaffing due to employee illness, absenteeism to avoid virus exposure, quarantining, or being furloughed (Ross, 2021). The CNDs also noted that the biggest challenges were limited budgets and underpaid employees. Exacerbating the situation, the remaining employees had to take on additional responsibilities, often without additional compensation (Kuhns & Adams, 2020).

Food Storage Challenges

Buying food in bulk was believed to be the best option available because of the perceived risk of food being out-of-stock. While some districts had sufficient storage, others had to transport surpluses to different schools. A few CNDs mentioned needing storage and meal packaging equipment like tray sealers or walk-in refrigerators to prepare and distribute meals during COVID-19. However, there were difficulties in purchasing and receiving storage and meal packaging equipment. The CNDs reported that many districts lacked adequate storage for dry, frozen, and shelf-stable foods needed for alternative menus, with refrigerator and freezer storage being the most critical. These issues were less severe in spring 2021 compared to spring 2020. For all time periods, refrigerator and freezer storage were the greatest needs.

Adaptive Capacity Strategies Used by Child Nutrition Directors During COVID-19

Adaptive capacity is the ability of school meal programs to make incremental adjustments in response to external shocks, such as COVID-19. Adaptive strategies are reported in Table 1 and described below.

Child Nutrition Program Employee and Child Safety Adaptive Strategies

To ensure safety during COVID-19, child nutrition programs implemented social distancing, mask-wearing, and personal protective equipment (PPE) use during food preparation and distribution, and received continuous training from state or federal sources. Student health was prioritized in safety decisions, and CNDs secured adequate sanitizing products, face coverings, gloves, and hair restraints. Several additional measures were taken to adhere to safety precautions for food distribution due to COVID-19 safety protocols (Tables 1–2). Most CNDs reported that the use of alternative safety measures was highest during the fall of 2020. An exploratory study found that routine food safety practices during COVID-19 were as manageable as pre-pandemic times (Patten et al., 2021). However, the new COVID-19 safety practices such as social distancing and mask wearing were more challenging and required extra effort for compliance (Beckstead et al., 2022; Patten et

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al., 2021). The CNDs also perceived reduced trust among parents and caregivers regarding food safety, which may have contributed to a reduction in school meal participation.

Food Distribution Strategies

By spring 2021, child nutrition programs shifted from cafeteria meal distribution to distributing meals directly to classroom students. Menus were altered to include easy-to-prepare, long-shelf-life foods. Limited food availability and storage led CNDs to become creative with menus. Outsourcing meals was considered but found too costly for many districts (Kuhns & Adams, 2020). Throughout all semesters and summer, ready-to-eat foods were reported as the primary type of food distributed (Figure 2). Parents often could not afford transportation to pick up school meals (Ross, 2021). Different meal provision methods are shown in Figure 2c. Some CNDs reported packing meals for the entire week, requiring further preparation at home. These adaptive strategies were temporary in nature, and some were transformative as CNDs kept these practices in place at the time of the survey.

Figure 2a. *Child Nutrition Director Responses Regarding Employee and Child Safety Efforts During the Pandemic.*

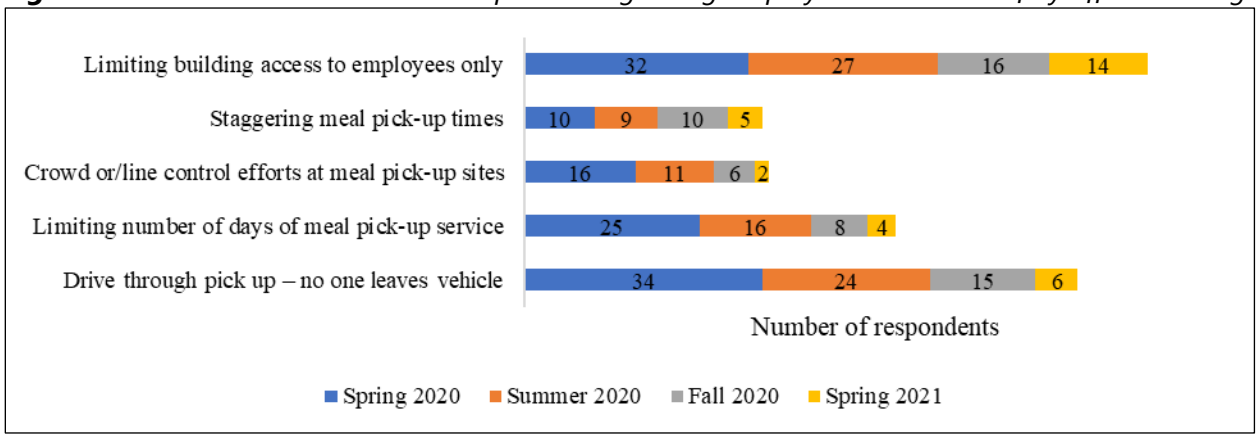

Figure 2b. *Child Nutrition Director Responses Regarding Different Types of Food Distributed During the Pandemic.*

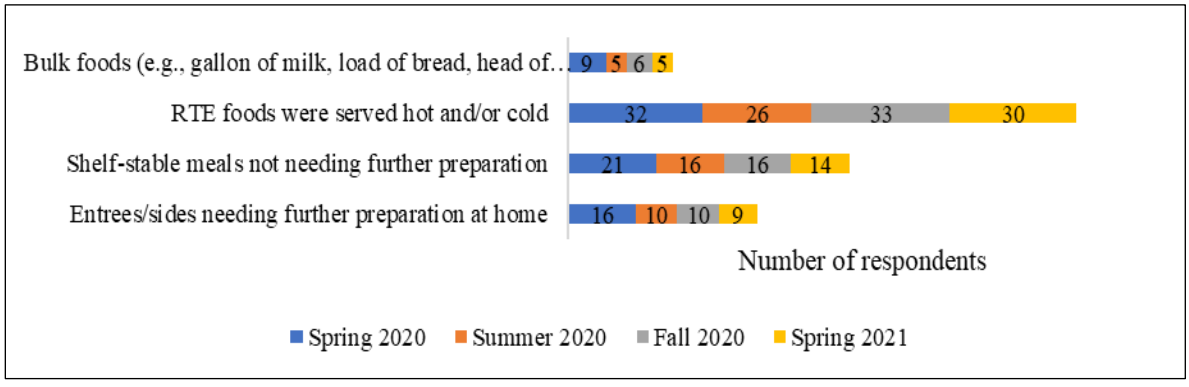

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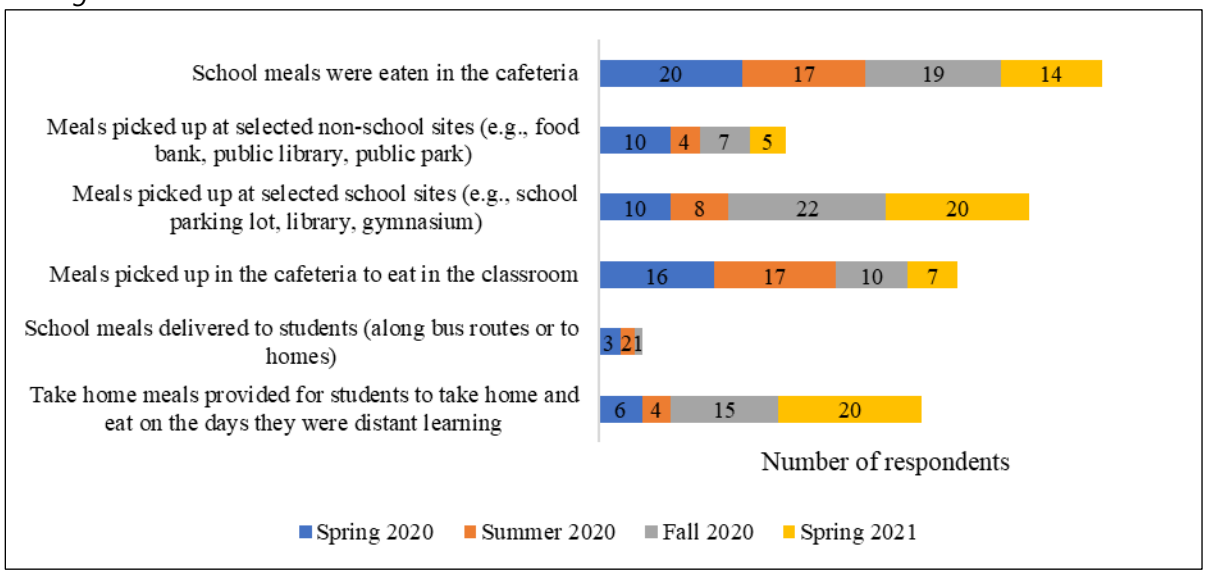
Figure 2c. *Child Nutrition Director Responses Regarding Different Types of Modes of Food Distribution Used During the Pandemic*



Workforce Challenges

Workforce changes were significantly influenced by the effectiveness of communication strategies. According to the CNDs in this study, improving communication to coordinate work schedules and leveraging volunteers for meal distribution were among the most effective ways to address workforce challenges. For instance, better coordination and clear communication channels facilitated smoother scheduling and task distribution among the workforce. However, reliance on social media as a communication venue posed challenges due to limited public internet access, which could hinder its effectiveness as a primary communication tool (Fleischhacker & Campbell, 2020; Johnson, 2020). In low-income regions, updates about food distribution, such as location changes, hours, and pick-up times, were often inefficient when communicated solely through internet-based methods (Jowell et al., 2023).

Strategies Reflective of Transformative Capacity

Transformative capacity is the ability of school meal programs to undergo significant changes in their processes and services in response to external shocks, such as COVID-19. The changes in food production, procurement, storage, and distribution strategies, that CNDs anticipated continuing even after COVID-19 passes, were categorized as transformative strategies. Table 1 provides a list of transformative strategies adopted by CNDs with quoted remarks. Continuing some food distribution methods and adopting offer-versus-serve meal patterns were identified as potentially continuing post-COVID-19.

Food storage and packaging equipment, such as tray sealers and blast chillers to prepare frozen meals purchased during COVID-19, will continue to be used in the future. The CNDs appreciated USDA waivers, which allowed them flexibility in procuring, preparing, and distributing food.

Transformative strategies were seen at the federal and state levels as well. With the passing of *the Keep Kids Fed Act 2022* in early 2023, a rule was proposed to reinstate focus on nutrition standards, including gradual sodium reduction, milk and whole-grain standards, and a new focus on added sugar restrictions (USDA Food & Nutrition Service, 2023a). The 2023 School Nutrition Association Position Paper calls for achievable nutrition targets as CNDs struggle to meet current standards rather than additional nutrition requirements (School Nutrition Association, 2023). The School Nutrition Association also emphasized the need for the COVID-19 reimbursement rates to be kept in the Keep Kids Fed Act, as well as to allow complete coverage for all students for all school meals. In October 2023, two acts were introduced that offered increased reimbursement rates and proposed universal school meals that did not require students to prove eligibility (*Helping Schools Feed Kids Act of 2023, H.R. 1424, 118th*, 2023). Further, nearly a dozen states have passed laws regarding universal school meals (Bylander, 2023; USDA Food & Nutrition Service, 2023b). All the CNDs who participated in focus groups reported that the administrative burden was eased due to the issuance of nationwide USDA waivers (Food and Nutrition Service, 2023). These waivers also helped the school districts identify innovative strategies and solutions they would like to implement in the long term. When these waivers expired in June 2022, they were extended through the *Keep Kids Fed Act 2022* for the 2022–2023 school year (*Keep Kids Fed Act of 2022*, 2022). In addition to extending waivers, reimbursement rates were increased in response to supply chain issues, employment troubles, and many of the same challenges reported in the present study (*Keep Kids Fed Act of 2022*, 2022).

Encouraging Outcomes

Despite the challenges posed by COVID-19, CNDs experienced some positive outcomes, as presented in Tables 1–2. Receiving recognition and appreciation from local communities in which CNDs serve for child nutrition programs was an unanticipated encouraging outcome of COVID-19. The CNDs noted that elevating the community's perception regarding the importance of school meal programs was the primary positive outcome. The swift communication to the public about school meal provisions during COVID-19 shows the rigorous effort by child nutrition professionals to maintain pre-COVID meal participation levels during emergencies (McLoughlin et al., 2020). Enhanced collaboration among school employees and districts, along with food donations and volunteering, were highlighted by the CNDs.

The major strength of this study is the use of exploratory sequential mixed methods. This study employed an RC Model (Figure 1) for the first time in the context of child nutrition. Using this model allowed for the identification of effective strategies used by the CNDs to continue school meal operations during and post COVID-19. However, this study also has limitations. This study focused on adaptive and transformative strategies in three southeastern states (MS, LA, WV), which face high poverty, food insecurity, and diet-related health issues. However, all states had different capacities to adapt and absorb stressor events, and therefore, they may have responded differently to COVID-19 (Kuhns & Adams, 2020). The participation turnout for focus

groups were low (50–60% of those who committed, attended) despite the incentives offered for participation. Since focus groups use purposeful methods for recruitment, there is always the risk of selection bias among those who agree to participate. Researchers did not have focus group participants provide feedback on transcripts. Ensuring that focus group participants review the transcripts strengthens the validity of the study by decreasing the risk of researchers' bias in interpreting the results. (Tong et al., 2007) Despite the low response rate in this study, saturation in the analysis of focus group discussions was reached based on the repetition of themes during focus group discussions. It is possible that participants in the focus groups could have also participated in the survey. Also, the survey had a low response rate, which could be due to the demanding nature of the CNDs' increased responsibilities and time restraints instigated by COVID-19. Recall bias might have affected responses due to the multiple timeframes covered. Demographic information of the CNDs, such as race, ethnicity, gender, and age, were not collected for focus groups and survey participants to support anonymity.

CONCLUSIONS AND APPLICATION:

This study, guided by the RC Model, assessed the strategies used to build adaptive and transformative capacities of school meal programs and challenges faced during COVID-19 in Mississippi, Louisiana, and West Virginia using focus groups and surveys with CNDs. To be better prepared if a future catastrophe should occur, further research is needed to identify and address the primary reasons for food inaccessibility and low participation rates in school meal programs during COVID-19.

Based on current study findings, the existing infrastructure of the schools determined which strategies could work during COVID-19. For example, one CND noted that they used a central kitchen model where one kitchen was used to cook food for all schools in the small district. Some school districts purchased additional food storage equipment because they had to serve more students at one facility. The CNDs also discussed the innovative strategies they adopted during COVID-19, such as (a) changes in staffing models, (b) food preparation and distribution provisions, (c) menu changes to include more shelf-stable items while trying to maintain nutrition standards even when they were relaxed, and (d) employing third-party food distribution companies to allow for easier food distribution.

In addition to the USDA waivers, different food delivery options worked during COVID-19. The most useful food delivery option varied with school district size, location, and demand for food. All the CNDs who participated in this study survey reported the use of grab-and-go at some point during COVID-19, but further research is needed to see the feasibility of these options, especially for those who may have difficulty in traveling to the pick-up site. Delivering food to a community center or to homes were other food delivery options implemented by some school districts, but these options pose additional employee workload and rely heavily on volunteers. Automated phone calls, text messages, and technical assistance to families may help with timely communication and increase effectiveness with enrollment in school meal program notifications (Fleischhacker & Campbell, 2020).

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Due to the nature of COVID-19, there was a shift in the priority of school meals from meeting nutrition guidelines to ensuring that all children are fed nutritious food without having to meet all of the nutrition standards through extended flexibilities through the Keep Kids Fed Act 2022 (Keep Kids Fed Act of 2022, 2022). One example provided by CNDs was using ready-to-eat and/or shelf-stable food as alternatives to fresh produce. Other adaptive strategies included contracting with vending and other food service companies. This was helpful for child nutrition employees in managing food provision and distribution processes but was an adaptive strategy and, therefore, temporary. However, some other strategies, such as breakfast in classrooms, are more likely to stay because of their operational feasibilities, reflecting transformative strategies. Other temporary strategies included food distribution along bus routes or drive-through facilities at school sites or non-school sites. These strategies also involved additional voluntary work from school bus drivers. There were also concerns related to training for volunteers who delivered food who may or may not have been previously trained for following food safety protocols or HACCP guidelines (Dunn et al., 2020). The USDA has made efforts to provide funding through grants and assistance to schools to not only provide meals to children but also refocus on the nutritional quality of school meals (United States Department of Agriculture, 2023).

Suggestions From Child Nutrition Directors

Capacity-building strategies that CNDs and all personnel involved in child nutrition can follow, based on the learning experiences from this pandemic, were identified in this study (Table 1). The CNDs noted that it is important to communicate with other school districts to implement changes through regular meetings and discussions. They emphasized the need among different school districts to discuss the strategies that worked well and those that did not. They also identified the importance of documenting issues needing to be addressed during emergencies and the revision of standard operating procedures that were successful in aiding the continuation of meal distribution. At the same time, it is necessary that all parents and caregivers are aware of the special opportunities during an emergency. CNDs reported in this study that several parents missed receiving meals for their children because they never applied for free lunches.

The emergency preparedness policies are designed to guide child nutrition employees in ensuring the availability of school meals, food storage, necessary equipment, and shelf-stable meals during emergencies. Emergency preparedness trainings need to be targeted towards enhancement of sanitation, best feeding practices in an ever-changing situation, how to encourage student participation and build parent trust, how to adapt to constantly changing and new regulations, and other professional development training for handling challenging situations.

This study's findings can inform the development of future emergency protocols and school meal policies. Many CNDs reported they were able to pivot to emergency feeding practices during COVID-19. However, there is a dire need for systematic training in emergency feeding practices. Additionally, child nutrition programs need additional funding and storage and distribution equipment to assist programs in being resilient. Due to the timely policy-level interventions such as the COVID-19 child nutrition waivers and related ease of access to school meals, the child nutrition program employees were able to implement certain measures that increased the resilience capacity of the child nutrition programs.

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Future guidance from national and federal organizations may take time. Lessons learned from these CNDs may not apply to all schools. States should provide recommendations for schools on how to mitigate disasters such as COVID-19 based on data collected during this unprecedented time. However, on a local level each district should evaluate what policies and procedures work best for their community.

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ABSTRACT

PURPOSE/OBJECTIVES

This study investigates the methods and strategies adopted by CNDs in southeastern U.S. schools to maintain efficient and safe school meal distribution during COVID-19 challenges.

METHODS

This exploratory sequential mixed methods study was guided by a conceptual resilience capacity model for assessing resilience capacity in school meal programs. Focus group discussion themes were used to inform survey development. Sixteen CNDs from Mississippi, Louisiana, and West Virginia participated in focus groups between March and August 2021, and 47 CNDs completed surveys between January and March 2022. A combination of inductive and deductive analysis, followed by a constant comparative approach, was used to organize statements from focus groups. Statements were thematically guided by the conceptual resilience capacity model, specifically the adaptive and transformative strategies. Surveys assessed the impact of COVID-19 on meal program operations, and included types of foods distributed, provision methods, food storage space, safety measures, change in employment, and encouraging outcomes, if any, that the CNDs may have experienced. Descriptive statistics were used to characterize barriers and challenges identified by the CNDs participating in the surveys.

RESULTS

Four themes emerged from focus groups, including stressors, adaptive capacity, transformative capacity, and perceived encouraging outcomes, each with several subthemes. Survey findings highlighted nine stressors (such as securing food, workforce, and food storage), thirteen strategies of absorptive and adaptive capacity (mostly related to food distribution and ensuring the safety of program employees and students), and six encouraging outcomes (such as the recognition of the importance of child nutrition). CNDs noted capacity-building strategies such as improved communication, better documentation, and revision of standard operating procedures.

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APPLICATIONS TO CHILD NUTRITION PROFESSIONALS

This study highlights the need to improve the resilience of school meal programs focusing on funding, infrastructure, training, communication, and documentation strategies. Study findings can inform future emergency school meal policies and procedures.

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