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Teen Food Insecurity: Finding Solutions through the Voices of Teens

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Teens are vulnerable to food insecurity for both biological and social reasons. This study aimed to better understand the factors that underpin teen food insecurity and the coping strategies teens employ when faced with limited food access and hunger. A sociodemographic survey including the USDA's Self-Administered Food Security Survey Module for Children Ages 12 Years and Older, focus groups, and photovoice were used to collect data on the demographics, food insecurity prevalence, and experiences of food insecurity among thirty-eight teens from five different communities in Tampa Bay, Florida. Results showed that approximately 44 percent of teens were food insecure. Factors that associated with food insecurity included: (1) negative perceptions of food quality, food options, school administration, food waste, and food assistance utilization; (2) school and programming issues including the timing of meals, portion sizes, and regulations associated with food and access; (3) stigma and bullying; and (4) socioeconomics. Teens relied on their communities (e.g., friends, churches), illegal activities (e.g., stealing), cheap and unhealthy foods, jobs, or their teachers to cope with food insecurity. The findings highlight significant opportunities for food security interventions that target the unique nutritional needs and social experiences of adolescents. The study was funded by the county Juvenile Welfare Board.

Key words: food insecurity, adolescence, teens, school nutrition, photovoice, competitive foods, applied anthropology

Introduction

Food insecurity refers to having limited or uncertain access to adequate amounts of safe and nutritious foods (USDA 2018). Experiencing food insecurity has negative impacts on one's health and well-being, including increased risks for chronic diseases, obesity, and mental health disorders (Hadley and Crooks 2012). However, food insecurity is especially consequential for adolescents ages eleven to eighteen years. Adolescence is a critical time of physical and cognitive growth within the life course. It is essential that teens receive an adequate diet and appropriate nutrition in order to develop and mature properly and avoid future long-term health consequences. Despite the sensitivity of the demographic to food insecurity, food-insecure teens remain an understudied population. While there is a growing body of literature focusing on the effects of food insecurity, there has been little research concentrating specifically on the prevalence of teen food insecurity and the experiences of food-insecure teens.

Food insecurity can cause poor health outcomes stemming from both overnutrition, undernutrition, and micronutrient deficiencies in teens (Cook and Frank 2008). Malnutrition stemming from food insecurity during childhood can result in lowered immunity, growth stunting, early or delayed puberty, and heightened risks for adult-onset diseases such as type 2 diabetes, cardiovascular disease, and hypertension (CDPH 2015; Cook and Frank 2008; Locher et al. 2005). In addition, food insecurity is associated with mental stress such as worry and anxiety surrounding food, socioeconomics, and, especially among adolescents, fear of judgment from others (Connell et al. 2005). Approximately 12 percent of households in the United States are food insecure, and 4.5 percent of households have very low food security (Coleman-Jensen et al. 2018). United States households with children tend to be at an even higher risk of food insecurity, with nearly 16 percent of households currently food insecure (Coleman-Jensen et al. 2018). Furthermore, research shows that households with older children have higher rates of food insecurity (Nord 2009; Ralston et al. 2017). In 2015, food insecurity was more than twice as prevalent among households with teens compared to households with children four years or younger (Ralston et al. 2017) This disproportion may be due to the fact that younger children are buffered against food insecurity and hunger by adults or older siblings more often than older children (Nord 2009). In addition, families with children five years or younger can receive assistance from the

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Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) (USDA n.d.).

While there has been a growing amount of research focusing on the effects of food insecurity, there has been little research concentrating specifically on the prevalence and experiences of teens. On one hand, adolescence is a time of substantial growth and development, which is subsequently related to increased nutritional needs (Das et al. 2017; Spear 2002). On the other hand, teens have a distinct awareness of their social and economic environments, which has been connected to increased concern with what others think of them and self-consciousness (Choudhury, Blakemore, and Charman 2006; Steinberg 2005). This awareness and concern may keep teens from asking for, or accepting, food assistance because of stigma, embarrassment, bullying, and peer pressure (Connell et al. 2005), and thus, increase teens' vulnerability to food insecurity. Teens also have noted they feel food assistance programs are not targeted directly towards their age group and are more often being marketed towards younger children (Aviv 2015). Furthermore, teens may feel that the food being provided through these programs does not have sufficient sustenance to keep them full (Aviv 2015). A more comprehensive understanding of how teens experience food insecurity can identify gaps in food assistance and help to ensure programs are efficiently marketed towards teens.

Teens are situated between childhood and adulthood and are often faced with conflicting responsibilities. Teens may feel a sense of responsibility to provide for their families in times of food insecurity and make use of various strategies to assist the family (Fram et al. 2011). As a result, some teens may engage in risky or illegal behaviors that could be harmful to their development. Food insecurity also plays an important role in mental and social health and has a significant effect on the emotional well-being of children and teenagers (Alaimo et al. 2001; Cook et al. 2004; Fram et al. 2011; Peterson et al. 2014; Shtasel-Gottlieb et al. 2015). When facing food insecurity, adolescents express concerns about food availability, stressed family relationships or interactions, and fear and embarrassment caused by social stigma (Alaimo et al. 2001; Cook et al. 2004; Fram et al. 2011; Peterson et al. 2014; Shtasel-Gottlieb et al. 2015). Ultimately, the stress of food insecurity can lead to depression (Connell et al. 2005).

This study identifies issues related to food insecurity among teenagers in Tampa Bay, Florida, and aims to better understand the experiences and coping strategies involved with teen food insecurity. The study also generates ideas for improving food assistance programs for teenagers by talking to teens themselves. Because teens have a unique set of needs, both nutritionally and emotionally, that set them apart from adults and children, it is important to understand the causes of teen food security to ensure communal efforts are effective.

Methods

This study (PRO #00032420) was approved by the University of South Florida Institutional Review Board. The research was conducted at various community sites within one county of Tampa Bay, Florida. Tampa Bay is home to more than 3,000,000 residents (EDR 2018). Approximately 15 percent of the residents living in the research county are food insecure (Aviv 2015).

Data Collection

Data were obtained through focus groups with a total of thirty-eight teens at five different community sites within Tampa Bay, Florida. Convenience sampling was used to recruit teens at after-school community centers. Participation in afterschool programs is significantly higher among low-income households and minority children when compared to higher-income and Caucasian families (Afterschool Alliance 2014). Furthermore, 25 percent of children in areas of concentrated poverty participate in an afterschool program (Afterschool Alliance 2014). Thus, recruiting teens from local afterschool community centers allowed us to reach teens that were more likely to be food insecure because low-income status, as well as being African American or Hispanic, is also associated with higher rates of food insecurity in the United States. (Coleman-Jensen et al. 2018; NCCP 2011). Study staff provided flyers and short presentations of the study goals and methods to teens at each site. To be eligible, teens had to provide parental permission and written assent, be between the ages of eleven and eighteen years, and live in the community.

Four primary focus groups, with no more than eleven teens participating in each, were conducted at four different community centers. There were two facilitators for each focus group – one asking the questions and discussing with the teens and the other taking notes and recording. One facilitator asked the questions for three sites, and the other asked the questions at one site. The facilitators used the same focus group prompt, which had questions and probes and had been approved by the university institutional review board. Thus, the questions used for each focus group were consistent. At the beginning of the primary focus groups, teens completed a self-administered sociodemographic survey, which asked about their gender, ethnicity, age, grade level, household size, and whether their households receive government-funded food assistance. The survey also included the USDA Self-Administered Food Security Survey Module for Children Ages 12 Years and Older (USDA 2006). The USDA Food Security Survey has been used by other studies among children and teens (Connell et al. 2005) and is designed around the USDA food insecurity definition. This definition includes four components that are incorporated into the survey: quantity, quality, psychology, and social components (Connell et al. 2005). The primary focus groups asked teens to discuss their observations of food insecurity in their communities, including schools, and strategies used by teens to mitigate food insecurity. The questions included topics of food acquisition and challenges, limitations to getting adequate amounts of safe and nutritious foods, and coping mechanisms teens use to deal with food challenges

and insecurity. The focus groups also asked teens to provide ideas for teen food insecurity initiatives and solutions.

Thirteen teens that had completed the primary focus groups were recruited to also participate in photovoice. These teens were provided disposable cameras and asked to take photos of what teen food insecurity looks like in their community and their ideas for solutions. Photovoice participants then came together for a final focus group at three community centers. Two of the community centers remained the same (same location where the initial focus group was held). However, because one of the initial community centers did not have any photovoice participants, the site for the photovoice focus group changed to accommodate the center that had bussed the students for the initial focus group. Thus, we added a new community center for the final photovoice focus group. Photovoice participants shared their photos, provided captions, and answered the following questions in relation to their pictures: (1) What do you see here? (2) What is really happening here? (3) How does this relate to our lives? (4) Why does this condition exist? (5) What can we do about it?

Analysis

Survey and food insecurity data were analyzed using IBM Statistics SPSS Version 24.0. Descriptive statistics were obtained for sociodemographic and food insecurity variables. Due to a printing error, thirteen of the teens had incomplete food security questionnaires. Thus, these teens were removed from any statistical analyses related to food insecurity, bringing the sample for the food security statistics to twenty-five. Focus groups were transcribed and uploaded to Dedoose Version 8.0.39 for content analysis. Inductive, grounded-theory analysis was used to code the full transcriptions line-by-line (Bernard 2011). Initially, researchers read through the transcripts and field notes to induce ten large themes based on the objectives of the study, repetition, and word count (Bernard 2011). These included: (1) *factors hindering food security,* (2) *perceived consequences of food insecurity among teens,* (3) *coping mechanisms,* (4) *ideas for food solutions,* (5) *ideas for program solutions,* (6) *food sources for teens,* (7) *awareness of family's finances,* (8) *feelings of lack of autonomy,* (9) *perceptions that schools prioritize money of student's preferences or health,* (10) *awareness/understanding of a healthy diet*. Each major theme was then analyzed individually to find various sub-themes. For example, within the theme *factors hindering food security*, we coded for: (1) *time,* (2) *finances/ socioeconomics*, (3) *access to transportation issues*, (4) *food waste*, (5) *stigma*, (6) *school issues*, (7) *preference*, and (8) *issues with current food assistance*. We additionally coded for sub-sub themes to highlight variation within subthemes. As the coding progressed, we used theme-linking to combine some of the major themes and create sub-themes that spoke to multiple sub-sub themes (e.g., *perceptions that schools prioritize money* was moved into *factors hindering food security* under a new subtheme *negative perceptions*). Lastly, to focus and uncover our main findings, we further linked themes by combining many of the subthemes and organizing themes based on their links with one another (Bernard 2011). We quantified the final themes, subthemes, and sub-sub themes to determine the most common. These final and most commonly noted themes are reported in this paper and in Table 2.

Table 1. Sample Demographics

Characteristic	
Gender, no. (%)	
Female	14 (36.8)
Male	24 (63.2)
Race, no. (%)	
Biracial	4 (10.5)
Black	17 (44.7)
White	12 (31.6)
Other	4 (10.5)
Missing	1 (2.6)
Ethnicity, no. (%)	
Hispanic	15 (39.5)
Not Hispanic	22 (57.9)
Missing	1 (2.6)
Age, mean (± SD)	13.7 (± 2.03)
Grade, mean (± SD)	8.8 (± 1.95)
Household size, mean (± SD)	2.3 (± 1.29)
SNAP Participation, no. (%)	13 (34)
Food Insecurity, no. (%)	
Food Insecure	11 (28.9)
Food Secure	14 (36.8)
Missing (incomplete)	13 (34.2)

Results

Summary statistics of participants' demographics are presented in Table 1. Participants were primarily male and ethnic-racially diverse. More than 40 percent of participant teens were food insecure, with approximately one-third living in households participating in the USDA Supplemental Nutrition Assistance Program (SNAP).

Factors Behind Food Insecurity

Code counts for the main themes from the focus groups are listed in Table 2. Table 2 includes the most common mentions for factors behind food insecurity, coping strategies, and teens' ideas for solutions.

Negative Perceptions

Almost unanimously, teens had negative perceptions of the quality of food offered within their schools and summer programs. They discussed the appearance ("watery," "green,"), ingredients ("fake," "trash," "unhealthy,"), and preparation of the food as undesirable ("burnt," "undercooked"). As one student described, "It [the school food] was disgusting. It looked disgusting. They would like, pick

Table 2. The Number of Times the Coded Theme Appeared among Teen Focus Group Discussions

Influential Factors		Coping Strategies		Teen's Solutions	
Theme	Total times variable appeared	Theme	Total times variable appeared	Theme	Total times variable appeared
Negative Perceptions		Community	36	Improve Quality/ Consider Preference	39
Quality	113	Illegal Activities	32	Increase quantity	24
Preference and Lack of Autonomy	78	Cheap Foods	23	Healthy Alternatives	16
Food Waste	23	Work	20	Increase Education and Awareness	15
Administration	19	Teachers/School	20	Social Support	11
Food Assistance	10			More Assistance	11
School and Programming Issues					
Time	51				
Quantity	37				
Rules	26				
Stigma/Bullying	56				
Socioeconomics	54				

up the eggs and water would drip out. Disgusting. There's water in the pan."

Students also expressed concerns with the safety of the food at school, speaking of times when they were served spoiled or expired food, witnessed food sitting out from breakfast to lunch, and classmates getting sick after eating school food. One teen described the food in his school cafeteria by saying, "Well, obviously they prepare, they pre-cook it so they can just put it all out when the kids come. And you can't cook an egg and then let it sit. And then heat it up again and give it to kids…. I don't think that's right." Reheating the food posed a safety risk in the students' eyes.

Participants perceived school administration in a negative manner as well. They felt their schools were prioritizing money over student nutritional needs and preferences. Furthermore, teens were concerned with the amount of food

Figure 1. Photovoice Photo Titled "Fake Breakfast," Which Teens Used as an Example of the Low-quality Food Options at School. The photo displays a stainless-steel lunch counter with a row of four cardboard food containers with the statement "start the day with a healthy breakfast" branded in red capital letters. Each container holds a single croissant bun with an egg between the slices. The egg-croissant sandwich takes up less than a fourth of the space of the container.

Figure 2. Photovoice Photo Titled "Need More," an Example of When Teens Thought They Should Have Received More Food. The photo displays a teen holding a cardboard plate with the red lettering "start the day with a healthy breakfast." The container holds a small bag of fruit juice, a "pig-in-a-blanket," which is a miniature hot dog or similar type of processed meat fried in dough, and a bag of apple slices. The food and juice take up approximately half of the cardboard container.

waste they witnessed daily at their schools. This only exacerbated their perception that school administration is not concerned with food security. Correspondingly, participants believed they had very little autonomy in their food choices unless they brought their lunch or had the resources to purchase from the competitive food options.

The belief that teens are not allowed to use food assistance programs outside of school if they are under eighteen was another perception that limited food security. In addition, participants felt teens would not feel welcome at food pantries or shelters due to mistrust and stigma from adults.

School and Programming Issues

Teens felt they *did not receive enough food* to fill them up or to prevent feeling hungry while at school or summer programs. Whether a student is on the free and reduced-price lunch program or not, they must pay extra if they want more food than what is provided in the school lunch or breakfast. One student explained, "There's barely enough food on the tray for someone to eat and get some energy from it. Pretty much, schools aren't providing enough food for children to eat. So that's why people are still hungry afterwards, even though lunch was like, two hours later…. And if they want to get another one of these, then it costs more money."

Teens were knowledgeable about the needs of their growing bodies and how this time of transition increased their appetites. They felt that their unique nutritional needs were not considered within school and program planning. They also discussed the need to obtain sufficient "energy" to do well in school and discussed how hunger made it hard to concentrate and often initiated poor behaviors among their classmates.

The amount of *time* provided for school breakfast and lunch was also viewed as a factor behind teen food insecurity. Teens felt that they did not have enough time to eat at school and often had to balance other activities, such as tutoring and club meetings, during the school lunch period.

Rules prohibiting teens from being late to class and eating in the classroom further restricted the limited time window students had to eat. Food and lunch periods were also used as punishment within schools and afterschool programs. Teens discussed that many schools made students get a less-desired supplemental lunch if they did not have lunch money or were behind on their lunch account. In addition, some teens said they were made to get in the lunch line last if they were in detention, leaving them much less time to eat than other students after getting their food.

Stigma and Bullying

Stigma and bullying were common reasons for why teens did not use food assistance at schools or in public spaces within their communities. They stated that teens would feel "nervous," "uncomfortable," or "embarrassed" to accept food assistance in front of their peers for fear of judgment and ridicule. They explained that all the food assistance

Figure 3. Photovoice Photo Titled, "Come on Now," Displaying a Slice of Bread Used to Create a Cheese Sandwich That Was Provided as a Supplemented Lunch for Students Who Were Behind on School Lunch Payments. The photo shows a stainless-steel counter with four cardboard containers each holding a single grilled slice of white bread.

programs at school, both outside of the free and reduced-price lunch program and at their afterschool programs, lacked confidentiality. As one teen explained, "Yeah, it's kind of embarrassing…. When all your other friends are around. You don't take as many [foods] as you want to. If you don't eat at home or your sisters and brothers don't eat at home…you want to take more than one. But you don't want to take it in front of other people."

In addition, teens said it was sometimes obvious which students participated in the free or reduced-price lunch program because those students were not able to purchase competitive foods. Competitive foods refer to for-profit foods that are sold by the school but are separate from the National School Lunch Program (Poppendieck 2010), meaning they are not included as options for students on free or reduce-price lunch. Schools make a profit from these items, which typically include a la carte snack foods, desserts, and "hot snack items" such as french fries, pizza, and chicken tenders (Templeton, Marlette, and Panemangalore 2005). Competitive foods are sold through vending machines, snack bars, or a la carte menus (Templeton, Marlette, and Panemangalore 2005). Participants discussed witnessing students being made fun of for not having lunch money, being called "poor," and bringing what they considered odd items to school to eat (e.g., eating Cheerios from the box for lunch without milk, which was brought from home). Stigma also resonated with fear. Participants discussed their peers may not ask for help because of fear of getting their families in trouble or getting put in foster care.

Interrelated to bullying, teens explained how their emotions further intensify food insecurity. One teen described the embodied experience by stating, "Some people…it's probably because they get insecure with body changing or they're being rude to you…. So, you don't feel like you have an appetite. You pretty much just go and pick up your food

Figure 4. Photovoice Photo Titled, "Junk." The photo shows a Skittles candy wrapper. Teens provided many photos of the unhealthy food options they choose because those options are cheaper than healthy food.

and throw it out and wait there until lunch ends because you don't feel good about yourself." Thus, bullying and stigma can keep teens, even those who most need food at school, from eating or accepting food assistance.

Socioeconomics of the Household

Teens were knowledgeable of the financial circumstances of their households. They viewed income, spending habits, and the demographics of their homes as factors behind food insecurity. Spending habits that teens felt limit food security included spending money on other items besides food (such as shoes and drugs) as well as purchasing cheap but unhealthy foods. Homes with small children and older adults, or households with only one parent, were believed to be associated with less access to income and nutritious foods. However, teens also discussed that adolescents living in the home increased the rate in which food ran out, due to the growing needs and appetites of teens. As one teen described:

Like I said earlier, maybe some people live with their grandparents or aunts or somebody. Or takes care of themselves. Like, I have a friend, she lives with her grandparents and her little brothers and sisters, and they're like five and under. And her grandma can't take care of all of them. So, she has to go out and find a way to get food for all of them, too.

Coping Strategies

Teens employed many creative strategies to deal with or prevent hunger, which sometimes results in socially unacceptable behaviors such as stealing. The most common strategy was to turn to their community. Community included churches, neighbors, friends, and community centers, such as their after-school and summer program sites. Some teens got jobs to provide for themselves or to help their families, and some participate in illegal activities. Stealing food, as well as other necessities such as school supplies, was a common and justified coping mechanism. Selling drugs and "selling themselves" were other illegal activities mentioned, although the teens did not elaborate on what they meant by "selling themselves." One example came from a teen describing a classmate:

> This girl, she couldn't get food so people would, like, pick on her. And then one day, she came to school and she had her backpack. At the end of the day, the teacher couldn't find the iPad so they were going through and checking everyone's backpack, and then the teacher dumped out her backpack and she had, like, canned foods and everything fall onto the floor and stuff because she had to steal it from the store.

Relying on cheap and convenient food items such as fast food, snack foods, and candy was another way teens dealt with hunger. They explained that these foods were more affordable than a full meal at school or healthy food options (e.g., a McDonald's hamburger costs less than a salad; skittles only cost $0.75 compared to the $3 school lunch).

Lastly, teens relied on help from their teachers. They positively discussed teachers who would provide snacks or lunch food to those who were hungry or did not have money for the school lunch. They explained that some teachers would let them utilize the school food assistance programs more than allowed if needed. In addition, teens were appreciative of teachers that allowed them to eat in the classroom, as this gave them more opportunity to eat during the day.

Teens' Ideas for Solutions

Teens were asked to recommend solutions for teen food insecurity in their communities during focus group discussions and with their photovoice photos. The most common recommendation was to improve the quality of food served at school and within community food assistance programs, as well as increase the quantity of servings. Similarly, teens felt that if programs and schools would consider their preferences when designing their menus and choosing what foods to giveaway or serve, more teens would eat the provided foods. They explained that a good strategy would be to provide healthy alternatives to favorable foods, giving the examples of hidden vegetables or having taste tests of healthier versions of desired items.

Another strategy teens recommended was to increase awareness and education about food insecurity, stigma and bullying, food assistance options, and the importance of healthy eating. Furthermore, participants recommended that education should extend to school staff and administration. Teens felt that their concerns and preferences should be heard and considered within local food and nutrition services. They recommended conducting a school-wide survey asking students about their perceptions, concerns, and food preferences, which would be given to school administration.

Lastly, teens felt that social support groups and mentorships could help strengthen community and social networks and build confidence among teens. In addition, more local food and income assistance to families and parents were mentioned as a short-term solution for households in need.

Discussion

School Food and Prioritization of Teen Needs

Free food at schools may be some of the only free food immediately accessible to teens since most food assistance programs are not targeted to them (Shtasel-Gottlieb et al. 2015). Despite the importance of school food to the teen diet, many of the participants in this project were seeking alternative foods beyond the school lunch. This is consistent with other studies, which have shown a large percentage of children do not eat the provided school lunch, and teens above age fourteen are the least likely to do so (Contento et al. 2006; Hamersa and Kim 2016; Janavi et al. 2016; Poppendieck 2010; Ralston et al. 2008; Savige et al. 2007). Teen preference was the primary reason that the participants in this study were not enthusiastic about the school options, including preference about food types, food quality, food timing, and the method by which the food is accessed.

While parents and administrators may assume that teens are not eating school food because it is "too healthy," the issue is more complex. The teens in this study were knowledgeable about which foods meet their nutritional needs. Other studies confirm that teenagers are a reliable source of information about their own dietary needs (Fram et al. 2011; Fram et al. 2015; Popkin, Scott, and Galvez 2016; Shtasel-Gottlieb et al. 2015). Teens in these focus groups did sometimes feel as if the foods chosen to be in school programs were healthy and were especially fond of fresh foods like salads and whole foods. Junk food options were listed as "foods that teens like to eat." However, there was an equal number of complaints that many school options were not healthy, and that healthy options in the community were more expensive than cheap, high-calorie foods. Several teens believed healthy food should be cheaper than junk food but recognized that junk food is more desirable because of its taste and accessible calories. These results show that teens know what they should eat, but they also know what they want to eat, and it is a challenge to balance these two perspectives.

Lack of satisfaction with the quality of the food was a common theme among all focus groups. Dislike for the taste or appearance of the foods served during school lunches has also been a consistent issue in other research studies on school food (Contento et al. 2006; Janavi et al. 2016; Neumark-Sztainer et al. 1999; Poppendieck 2010). The negative perception of the texture and visual impact of the food, and the perception of it as frozen and reheated instead of fresh, may be influencing overall opinion (Contento et al. 2006). Food preference is often left out of planning for food insecurity interventions, but it must be taken into consideration when designing programs for teens.

Teens have been shown in previous studies to be a highly sensitive and reliable source for understanding the nature of their food environment and the complex structures that affect their ability to access food (Fram et al. 2011; Fram et al. 2015; Popkin, Scott, and Galvez 2016; Shtasel-Gottlieb et al. 2015). Participants in this research had an acute perception of where they stood in the hierarchy of decision making related to their own food needs. Namely, many participants perceived that schools are prioritizing financial needs of the school and school policies over the needs and desires of the students themselves. Students cited the quality and types of food as evidence of this and the fact that they frequently saw foods reheated over consecutive days instead of being replaced with fresh food. Another common issue was the fact that students were not able to eat in the classroom. Teens are known to save food as a coping strategy for food insecurity (Popkin, Scott, and Galvez 2016). If they cannot eat in class, they can't use saved foods to augment the food they may not have had time to eat at lunch. For this reason, current school policies are working against documented feeding habits of food-insecure teens. Allowing classroom eating is an easy solution that can expand food access opportunities for students.

The perception held among teens that their needs are being compromised for the sake of the school budget and other school policies led to a lot of frustration among participants. This was particularly true when teens had concerns about the potential health consequences of reusing the same food resources across multiple days. Whether or not there is truly a health risk to reusing yogurt parfaits is not as significant for students as the idea that their health is worth less than the cost of fresh food. This perception could potentially be mitigated by rotating the food options so that the same types of foods as not offered every day.

Stigma

There are few populations as sensitive to social stigma as teenagers. In previous studies, stigma has been shown to prevent teens from seeking food assistance (Popkin, Scott, and Galvez 2016; Shtasel-Gottlieb et al. 2015). The results of this study have shown that even lack of access to food can make teens a target for bullying. For that reason, schools must consider how policies and programs that are designed to help students may, in fact, be inadvertently reinforcing this stigma or creating an environment for marginalization. Even food assistance programs like the pack-a-sack program or the share boxes in cafeterias are not likely to be utilized if they make student's needs visible to their peers. Teens will choose hunger over the risk of being embarrassed in front of or by their peers. While teens in this study did not explicitly discuss any relationship between stigma around food and disordered eating, the high rates of eating disorders among teenage girls in particular (Smink, van Hoeken, and Hoek 2012) may suggest that further research is needed into the relationship between stigma, food insecurity, and disordered eating.

The presence of competitive foods in schools is a controversial topic in studies of school nutrition (Templeton, Marlette, and Panemangalore 2005). Access to competitive foods is only available to those teens that have the economic resources at their disposal. What this means, in the hierarchical landscape of high schools and middle schools, is that access to competitive foods becomes an economic dividing line between categories of students (Bhatia, Jones, and Reicker 2011; Mirtcheva and Powell 2009; Poppendieck 2010; Stein 2008). It has been argued that the stigma related to food access in high schools will never completely disappear until competitive foods are eliminated or made free for the whole student body (Poppendieck 2010). However, the economic benefit of competitive foods for the school system makes their elimination unlikely. Most schools cannot afford to only offer school lunch.

The most popular food support services in schools were those that were not visible to other students. This included using a swipe card and pin to purchase food because all students accessed food the same way without a clear indication of who was getting free or reduced lunch. Vending machines were also a popular option for avoiding stigma because extra foods could be purchased quickly and then saved in a backpack to be eaten later. However, the most popular support options were teacher-led and occurred in the classroom. Many students brought up examples of teachers who had supplied food to the whole classroom or had a snack box available for any students who needed a snack. The classroom environment was less exposed, and therefore, put a student at less risk for stigma. In addition, students seemed to respect and trust their teachers more than school administration. Thus, we recommend that school food security initiatives, outside of the national school lunch program, be moved to individual classrooms where the setting is more intimate and trustful.

Autonomy and Choice

Teens may be the experts on their own lives, but they do not always have much control over their food resources (Bassett, Chapman, and Beagan 2008). In the school environment, the choices of availability, quality, and quantity are made for them by school administrators. In their homes, parents are often in charge of deciding what teens can and should eat because their parents control the money and food purchases (O'Dougherty, Story, and Stang 2006; Patrick and Nicklas 2005). In some households, the desire for economic autonomy may be one reason why teens feel pressured to get jobs as soon as they are old enough (Aviv 2015). However, teens will also turn to dangerous coping methods to meet their food needs if the economic resources for a preferred diet are not available. This includes criminal activity such as stealing or selling drugs (Popkin, Scott, and Galvez 2016; Whitbeck, Chen, and Johnson 2006) or finding older partners who can offer economic support (Stevens 2010). Economic freedom, even gained by dangerous means, increases individual autonomy for teens. Ensuring a feeling of autonomy about food choices could be accomplished by involving interested students in the menu planning process. As previously expressed, teens know what they are supposed to eat, but they also know what they want to eat. By combining teens' food preferences with expert nutritional knowledge and planning, a balance between desire and health may be reached.

Ensuring autonomy over eating habits may be difficult to accomplish within the structure of a high school or middle school, but there are steps that can be taken to give teens a greater sense of control in the school environment. Extending the amount of time that students have to eat lunch would ensure that they didn't have to choose between talking, eating, or participating in clubs or tutoring. It would also alleviate the feeling of inequality associated with the process of "calling" lunch tables, which means that some tables have longer to eat lunch than others. If it is impossible to extend the lunch period, then allowing students to eat in the classroom would give them the opportunity to meet their food needs even if they have insufficient time to eat during the lunch period during a carefully timed lunch day.

Application

The photos and captions from the photovoice project were presented along with a presentation of the study findings at a community exhibit and to the Juvenile Welfare Board, a community organization that focuses on the health and well-being of local children through investments, partnerships, and programs centered around school readiness, educational equity and success, prevention of child abuse and neglect, and strengthening the community at large. Community gatekeepers, including politicians, school board members, members of the Juvenile Welfare Board, and local hunger organizations, attended the exhibit to hear the presentation on the study findings, see the photos, and hear from some of the youth involved in the project. The exhibit was a way to connect teens and the research to a broader community-wide audience and reach stakeholders with the goal of increasing understanding, awareness, and teen food security initiatives.

The findings were also presented to the local childhood hunger work group and the Juvenile Welfare Board in the form of a technical report as well as a visual/oral presentation. The results increased local awareness of the issue and initiated changes within local school lunch programs. Managers and staff within schools have been made aware of the study results and are working to readdress all food handling procedures. The cheese sandwich that was provided to students behind on their lunch payments (displayed in Figure 3) was eliminated from all schools in the county. Instead, students who do not have lunch money receive the main school lunch from the day's menu. With the goal of changing the perspectives students have of school food and administration, the county school food services department conducted a food show where students tasted different food items and dishes prepared by the local school staff and judged the food. The

most favored foods were included on local school menus. In addition, the local food services department let each high school design their own hamburger, which appears on the school lunch menus county-wide for one week out of the school year. Future initiatives and goals will include connecting teens at school to form "champion groups" that will act as a mediator between the school body and the food and nutrition manager and be included in food planning, issue recognition, and implementing food security and nutrition programs. Champion groups will also bring awareness of food insecurity and work to stop bullying and stigma in their schools. Other future initiatives include student tours of school kitchens, implementing a youth farm at a local high school, meetings between high school students and the superintendent, and development of a youth council at the Juvenile Welfare Board. The local Juvenile Welfare Board has added a section on teen food insecurity to their Childhood Hunger Initiative Workplan and will provide support for all the initiatives mentioned. The work plan includes increasing food access points to all students, despite socioeconomic status, in schools and the community, and conducting research on teen food insecurity and health outcomes.

In addition to these local initiatives, the findings from this research highlight areas of improvement within state and federal policy. To start, increasing funding for schools can allow schools the financial support they need and eliminate the need for schools to rely on the economic gains from competitive foods. The removal of competitive foods will significantly reduce stigma and division among students and can improve nutritional status among students as they will no longer be able to purchase "junk" or "snack" foods in substitute for the meal. More children may feel comfortable eating the food provided by the schools because it is the only option. Because the National School Lunch Program mandates that meals have at least one fruit or vegetable on the tray, this could ultimately lead to improved dietary quality among students (USDA 2012). Furthermore, increasing funding provided to schools will allow schools the security to provide all students the same meal despite the status of students' meal payment. Moreover, with improved financial security, schools will not have to provide lower-cost food items to students who cannot pay.

Lastly, because teens were fearful of re-used or expired foods, we recommend educational initiatives that teach students about food safety, expiration dates, and food waste. This may help change perspectives and build a better understanding of safe and nutritious foods.

Limitations

Teens are a hard-to-reach population within research (Sterzing, Gartner, and McGeough 2018). Due to the difficulty of finding willing teens to participate, the sample size for this study is small and was not chosen at random. We used convenience sampling at afterschool sites to find teens who wanted to participate and teens that were more likely to experience or witness food insecurity in their communities. Furthermore, the sample is not representative of the county population. Our sample majority self-identified as Black and/or Hispanic (approximately 85%), while only 21 percent of the county self-identifies as Black or Hispanic (United States Census Bureau 2018). However, some of the students did not complete the entire food security survey due to a printing error, leading to an even smaller sample size for the food insecurity data. In addition, the use of disposable cameras for photovoice could have limited teens' utilization and participation because they were not familiar with how to use the cameras. Talking to teens in groups may have also limited the openness of responses, as teens may have feared judgment by their peers.

Conclusion

The findings in this research project are consistent with findings in other studies about food security, which suggest that teens are a unique demographic that requires targeted food security interventions. This understudied population requires an understanding of their unique social and biological needs in order for interventions to be successful. It was important for the teenagers in this study to feel as if their preferences were being considered as a way of maintaining an element of autonomy over their food choices. Including teen preference in program development will show teens that their wants and needs are being respected, while also encouraging them to take advantage of healthy food options. The social threat of stigma was a powerful barrier for food access because it prevented teens from accessing the free or reduced-priced foods that were available to them. Schools are an important site for food security interventions because of the amount of time that teens spend at school. However, if support programs at school inadvertently reinforce stigma, they will not be effective. These findings are being used in the development of school and community food security interventions to ensure teens are no longer being left out of conversations about food access and malnutrition. The findings from this study provide valuable insight for understanding teen's perspectives and experiences regarding food insecurity and school/community nutrition programs, and the initiatives being executed as a result of these insights provide examples of projects that can be implemented throughout various communities in the United States.

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