

EFFECTS OF INCREASED COMMUNICATION
ABOUT CHILD NUTRITION ON STUDENTS'
PARENTS', AND FACULTIES' SATISFACTION
WITH SCHOOL LUNCH

By

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Title of Study: EFFECTS OF INCREASED COMMUNICATION ABOUT CHILD NUTRITION ON STUDENTS', PARENTS' AND FACULTYS' SATISFACTION WITH SCHOOL LUNCH

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Abstract: Participation in the National School Lunch Program (NSLP) increases school age students' nutritional quality and is encouraged as a strategy to promote healthy weight. Participation is related to satisfaction with and awareness of the program's benefits. Schools frequently fall short of communicating the benefits to key stakeholders. Less is known about parents' perceptions of childhood obesity and schools' role to offer healthy food and influence on satisfaction with school meals. The study's aim was to determine if a one-year intervention aimed at increasing schools' communications with stakeholder groups regarding NLSP affected satisfaction. Statistical analysis was conducted for each stakeholder group using Independent sample t-test. A secondary aim investigated parents' and faculties' perceptions of childhood obesity and schools' role to provide healthy food and NSLP satisfaction. Statistical analysis was conducted utilizing ANOVA followed by Tukey post-hoc analysis for significant results. Schools participating in the Cooking for Kids chef consulting program conducted an average of 5.9 communication activities. Surveys were administered to parents, faculty, and students at pre- and post-intervention. Almost half of parents and three-fourths of faculty reported awareness of one or more communication activities, with .62 and 1.42 average activities, respectively. There was a significant increase in parent satisfaction, with no change among faculty and small but significant decreases in elementary students and no change in middle and high school students. Satisfaction was significantly related to perception of childhood obesity and perception of the role of the school to provide food that promotes health for parents, but not for faculty.

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CHAPTER I

INTRODUCTION

Obesity affects 18.5% of school aged children in the United States (Centers for Disease Control and Prevention (CDC), 2017a). Childhood obesity leads to an increased risk of physical (World Health Organization (WHO), 2018), academic (Schwimmer et al., 2003 & Datar et al., 2004) and psychosocial consequences (Must et al., 1999; Levine et al., 2001; Janssen et al., 2004) during childhood. In addition, childhood obesity is a predictor of adult obesity, which is also associated with a multitude of physical, mental, and psychosocial consequences later in life (WHO, 2018). There are a variety of factors that play into the development of obesity, including both non-modifiable and modifiable risk factors (Hardy et al., 2004).

Schools are a unique platform for childhood obesity prevention because 95% of children in the United States are enrolled in the school system (U.S. Department of Education, 2018). In addition to spending a large portion of week days in school, some children consume up to two-thirds of their daily intake from school meal programs (Story et al., 2006).

Participation in the National School Lunch Program (NSLP) is associated with increased academic performance (Bailey-Davis et al., 2013), increased overall nutritional quality (Hur et al., 2011; Johnston et al., 2012; & Bergman et al., 2014b), reduced food insecurity (USDA Economic Research Service, 2017), and costs less than bringing a lunch from home (Mansfield & Savaiano, 2017).

Considering fall enrollment for 2018 was estimated at 56.6 million children (National Center for Education Statistics, n. d.) and that only 30.4 million school lunches are served per day (USDA, 2017b), that means that roughly 54% of students utilize the NSLP. Since participation in the NSLP has shown to be beneficial, the question arises of how to increase participation. Studies have shown that there are multiple factors that influence a student's participation (Bailey-Davis et al., 2013), with parent perception playing a major role (Ohri-Vachaspati, 2014). Based on this premise, this study increased the communication from schools to key stakeholders, parents and teachers/administrators, further referred to as faculty, about the importance of child nutrition and the benefits of the NSLP. This project was designed to answer the following questions:

Questions:

1. Is there a change in students' total satisfaction with school lunch after a one-year intervention of increased communication to parents and faculty about the school lunch program?
2. Is there a change in parents' total satisfaction with school lunch after a one-year intervention of increased communication about the school lunch program?

3. Is there a change in faculties' total satisfaction with school lunch after a one-year intervention of increased communication about the school lunch program?
4. Does parents' perception of childhood obesity being a problem at their child's school affect their satisfaction with school lunch?
5. Does faculties' perception of childhood obesity being a problem at their school affect their satisfaction with school lunch?
6. Does parents' perception of the role of the school to offer food that promotes good health affect their satisfaction with school lunch?
7. Does faculties' perception of the role of the school to offer food that promotes good health affect their satisfaction with school lunch?

Hypotheses:

Question 1:

H_a: There will be an increase in students' satisfaction after the one-year intervention to increase communication about the NSLP.

H₀: There will be no change in students' satisfaction after the one-year intervention to increase communication about the NSLP.

Question 2:

H_a: There will be an increase in parents' satisfaction after the one-year intervention to increase communication about the NSLP.

H₀: There will be no change in parents' satisfaction after the one-year to increase communication about the NSLP.

Question 3:

H_a: There will be an increase in faculties' satisfaction after the one-year intervention to increase communication about the NSLP.

H₀: There will be no change in faculties' satisfaction after the one-year intervention to increase communication about the NSLP.

Question 4:

H_a: There will be a difference in satisfaction between parents who have different perceptions of childhood obesity as a problem at their child's school.

H₀: There will be no difference in satisfaction between parents' who have different perceptions of childhood obesity as a problem at their child's school.

Question 5:

H_a: There will be a difference in satisfaction between faculty who have different perceptions of childhood obesity as a problem at their school.

H₀: There will be no difference in satisfaction between faculty who have different perceptions of childhood obesity as a problem at their school.

Question 6:

H_a: There will be a difference in satisfaction between parents who have different perceptions of the school's role to offer food that promotes good health.

H₀: There will be no difference in satisfaction between parents who have different perceptions of the school's role to offer food that promotes good health.

Question 7:

H_a: There will be a difference in satisfaction between faculty who have different perceptions of the school's role to offer food that promotes good health.

H₀: There will be no difference between faculty who have different perceptions of the school's role to offer food that promotes good health.

Terminology:

Activity: an intervention activity that was created by the research team

ADHD: Attention-Deficit/Hyperactivity Disorder

BMI: Body Mass Index

CDC: Centers for Disease Control and Prevention

CEP: Community Eligibility Provision

CFK: Cooking For Kids

CI: Confidence Interval

CND: Child Nutrition Director

CNP: Child Nutrition Professional

Elementary student: student in 3rd, 4th, or 5th grade

ERS: Economic Research Service

Faculty: any school teacher or administrator

FNS: Food and Nutrition Service

FRAC: Food Research and Action Center

HHFKA: Healthy Hunger-Free Kids Act

Intervention: year-long intervention including all intervention activities

Middle/high school student: student in 5th – 12th grade

NCES: National Center for Education Statistics

NHANES: National Health and Nutrition Examination Survey

NSLP: National School Lunch Program

Parent/guardian: an adult that claims to be the guardian of a student at a participating school

PSE: Policy, System, and Environment

S.D.: Standard Deviation

S.E.: Standard error

SEM: Social-Ecological Model

SNAP-Ed: Supplemental Nutrition Assistance Program- Education

SPSS: Statistical Package for Social Sciences

SWP: School Wellness Policy

USDA: United States Department of Agriculture

USDHHS: United States Department of Health and Human Services

WHO: World Health Organization

CHAPTER II

REVIEW OF THE LITERATURE

The unabated prevalence of childhood obesity and its negative effects on health are a public health concern, both in the United States and worldwide (Millimet et al., 2010). Based on data from the National Health and Nutrition Examination Survey (NHANES), the prevalence of childhood obesity has more than tripled in the last few decades, rising from 5% in 1971-1974 to 13.9% in 2003-2004 (Millimet et al., 2010), with the most recent data reporting 18.5% in 2015-2016 (Centers for Disease Control and Prevention [CDC], 2017a). Of the 18.5% children ages 2-19 years, adolescents 12-19 years of age had the highest prevalence at 20.6%, followed by school-aged children 6-11 years of age at 18.4% (CDC, 2017a). When compared with each individual state, Oklahoma has the 5th highest obesity rate for 10 to 17-year olds (The State of Obesity, n.d.).

Overweight and obesity for children and teenagers is determined by body mass index (BMI) percentiles for each age and gender. BMI is calculated by dividing weight in kilograms by height in meters squared (CDC, 2016). A child that is above the 85th percentile

for their age and gender is considered overweight, whereas a child above the 95th percentile is considered obese. Although BMI does not measure body composition, it has been shown to correlate with body fat percentage measured by skinfold measurements, densitometry, dual energy x-ray absorptiometry, and other body composition measurements that are considered better indicators of health (CDC, 2017c).

Negative Impact of Childhood Obesity

Although the impacts of adult obesity are well established, fewer studies have looked at the consequences of obesity during childhood. In addition, many of the studies that have looked at childhood obesity are cross-sectional, which show associations, but do not determine a causal relationship. The following impacts were associated with childhood obesity, but more research is necessary to determine the interaction between each comorbidity (Halfon et al., 2013).

Chronic Disease Impacts

Obesity during childhood increases the risk of obesity during adulthood. A review conducted by Reilly et al. (2003) concluded that 40-70% of children who are obese before puberty will become obese as adults. Whitaker et al. (1997) reported an even higher rate of 69% of obese 6-9-year olds and 83% of obese 10-14-year olds remained obese as adults. This is of concern because, during adulthood, obesity is associated with an increased risk of developing chronic diseases and other illnesses such as diabetes, cardiovascular disease, osteoarthritis, certain types of cancers, and can ultimately result in premature death (World Health Organization [WHO], 2018).

In addition to long term effects later in life, children who are overweight or obese struggle with a higher number of comorbid health conditions during childhood than their healthy weight counterparts (Reilly et al., 2003). A systematic review of 34 studies showed an association between childhood obesity and major cardiovascular risk factors, including high blood pressure, dyslipidemia, abnormal mass or function in the left ventricle, abnormal endothelial function, and insulin resistance or hyperinsulinemia (Reilly et al., 2003). Other known conditions include higher odds for asthma, sleep apnea, joint problems, allergies, low grade inflammation, headaches, ear infections, activity restriction, poor overall health, and three or more comorbidities, even when adjusted for age, gender, race/ethnicity, parent education, household income, and family structure (Must et al., 1999; Reilly et al., 2003; Halfon et al., 2013).

Mental and Developmental Impacts

In addition to physical health problems, children who are overweight or obese also face mental and developmental consequences. In a nationally representative sample from the 2007 National Survey of Children's Health, Halfon et al. (2013) found significant associations between attention-deficit/hyperactivity disorder (ADHD), conduct disorder, depression, learning disabilities, and developmental delays and increased weight in children, even after adjusting for confounding variables.

Childhood overweight and obesity has been shown to impact school performance in a number of ways. Overweight and obese children are four times more likely than their healthy weight peers to report experiencing impaired school functioning and are two times more likely to be placed in special education or remedial classes, or have abnormal

behavior problems (Schwimmer et al., 2003). A study conducted by Datar et al. (2004) found that, out of over 11,000 kindergarten students, those who were classified as overweight scored significantly lower on math and reading tests at the beginning of the school year, and then again at the beginning of their first-grade school year. In addition, compared to their normal weight counterparts, overweight and obese students had a higher average number of absences (Action for Healthy Kids, 2013) which can further impact school performance. While these studies show an association between high body weight in children and lower academic performance, there are multiple factors that affect a child's academic performance, so results should be interpreted with caution (Story et al., 2006).

Psychosocial Impacts

Overweight children are at greater risk for depression, anxiety (Must et al., 1999) lower self-esteem, and increased risk of psychiatric symptoms (Levine et al., 2001 & Janssen et al., 2004) compared to children of a normal weight. This could be related to reports that overweight children are more likely to suffer from being bullied at school and experience other social problems such as higher rates of loneliness (Jansen et al., 2004) and internalizing or externalizing problems (Halfon et al., 2013).

In addition to psychological and social impacts during childhood, a systematic review by Reilly et al. (2003) found that obesity during adolescence can have social and economic effects later in life, such as lower income, even after controlling for confounding variables such as educational attainment or social class.

Factors Influencing Childhood Obesity

Obesity results from excessive weight gain, which is due to a positive energy balance, meaning that more energy is being consumed than expended (Sahoo et al., 2015). Energy balance is affected by a combination of both modifiable and non-modifiable factors including genetics, environmental factors, lifestyle factors, and cultural factors (Hardy et al., 2004). Although genetics plays a role in the development of obesity, it is suggested that the effect is less than 5% when it is not coupled with other major obesity associated factors (Anderson & Butcher, 2006). In addition to genetics, dietary intake and habits, physical activity, age, gender, sedentary behaviors, family characteristics, school policies, and demographics are all considered possible factors that can lead to an increased risk of obesity (Sahoo, et al., 2015).

Due to the complex etiology of childhood obesity, in order to successfully address the issue, a large number and variety of factors need to be assessed. A recent systematic review of obesity prevention and obesogenic behavior interventions in child care conducted by Sisson et al. (2016) concluded that a multi-level obesity-prevention intervention that focuses on personal health of the child along with policies, parental involvement, teacher and administrator (further referred to as faculty) involvement, changing the child care environment, and staff training, is needed to create maintainable, life-long changes.

Social Ecological Model

As mentioned in the previous section, multiple influences affect a child's health behaviors. These different levels of influence are important to consider when designing

an intervention to improve health behaviors. Previous interventions that focused on addressing behavior at the individual level often downplayed the impact that social and environmental factors play in an individual's health; therefore, an ecological approach to health interventions is ideal for successful program implementation (McLeroy et al., 1988). One such model is the Social Ecological Model (SEM) which acknowledges and targets a combination of individual, environmental, and societal factors. Due to the complex interaction of influences that play a role in the development of childhood obesity, the Social Ecological Model can be useful in constructing an obesity prevention intervention (CDC, 2017b).

SEM addresses five layers of influence: individual influences, interpersonal influences, institutional and organizational influences, community influences, and influences from social structure, policy, and systems (Gregson et al., 2001). All five levels of influence play a role in health behaviors, making the SEM useful to influence behavior change (U.S. Department of Health and Human Services [USDHHS] and USDA, 2015). The model is most efficient when all levels are addressed (USDHHS and USDA, 2015).

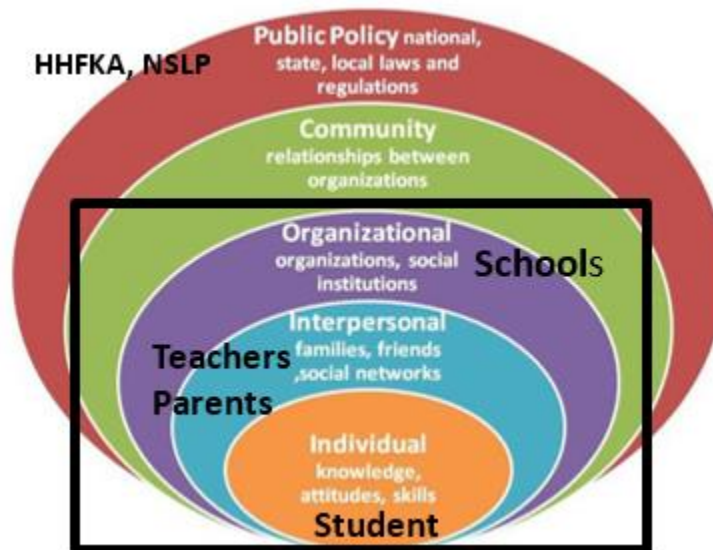


Figure 2.1: Social-ecological model related to school nutrition.

Source: Nguyen A., Hildebrand, D., Gates, G., & Brown, B. (2018) Food appeal and taste perceptions differ by school lunch participation during a chef-based intervention. *Journal of Nutrition Education and Behaviors*, 50 (7) S160.

Individual Factors

An individual's demographics, psychosocial factors, genetic make-up, individual food preferences, behavior choices, psychological factors, and cognitive factors such as motivation to change, attitudes towards new foods or school food in general, and knowledge about a topic among other factors make up the individual sphere of influence (Gregson, 2001).

Individual factors can promote or inhibit positive health behaviors. For example, a study conducted by Pearson et al. (2010) was designed to understand the individual, social, and environmental factors that affected change in fruit, vegetable, and energy-dense snack food consumption in adolescents during a two-year period. The study found a positive relationship between adolescents who reported high levels of self-efficacy for

increasing fruit and decreasing junk food and high actual intake of fruit and vegetables consumption and low intake of energy dense foods (Pearson et al., 2010). This finding suggests that a relationship between individuals who believe they are capable of healthy behaviors and achieving those behaviors. Although self-efficacy can be a positive influence, individual food preferences and lack of nutrition knowledge are common deterrents for children not selecting healthy choices in the school cafeteria (Fulkerson et al., 2002; Alcaez & Cullen, 2014).

Interpersonal Factors

Interpersonal influences include formal and informal social networks and support systems, such as family, friends, peers, and other primary groups, that affect the attitudes, behaviors, and social identity of an individual (McLeroy et al, 1988; Gregson, 2001). Parents, faculty, and peers all influence health behaviors throughout childhood to varying degrees. Throughout early childhood, children rely on their parents or caregivers to provide necessary food. During this time, parents shape the eating environment, eating behaviors, food preferences, and serve as models regarding dietary habits for their children (Anzman, et al., 2010).

As children grow older and more independent, peers and other groups begin to have a stronger influence on eating behaviors (Alcaez and Cullen, 2014). A study conducted by Fulkerson et al. (2002) surveyed 235 cafeterias staff members from 16 different schools in the Minneapolis area and determined the primary reason students did not make healthy food choices was due to influence from their peers. Cafeteria staff perceived students did not select healthier options due to peers and other students not

selecting the healthier options themselves (Alcaez & Cullen, 2014). Although peer influence can deter students from selecting healthy options, students who felt support in healthy eating by their best friend had an increase in vegetable consumption (Pearson et al., 2011).

Institutional and Organizational Factors

Institutions and organizations include businesses, schools, associations, public agencies, churches, and other organizations in private, public, and nonprofit sectors (Gregson, 2001). Each institution or organization generally reaches a large population and has formal or informal regulations to govern people within the institution or organization (Gregson, 2001). These systems, organizations, and industries play a role in the access individuals have to healthy foods and influence cultural and social norms (USDHHS and USDA, 2015).

Schools are unique in that they are the institution that has the most contact with children during their first twenty years of life (Peterson & Fox, 2007). A school's food environment can play a major role in student's dietary intake, since some students eat up to two meals and a snack at school each day (Story et al., 2006).

Community Factors

Community includes both formal and informal networks of individuals, groups, and organizations (Gregson et al., 2001). This level of influence also includes social and cultural norms and values such as any ideas, traditions, and belief systems an individual is a part of. These norms reflect the overall value of a group or society, such as parents' perception of school meals or the role of the school in childhood obesity prevention.

Increasing community support for nutrition education promotes behavior change by creating a more positive environment with a shared goal of improving nutritional status of the community (Gregson et al., 2001).

Social norms within a community can affect a child's health behaviors in a variety of ways. For example, a study conducted by Thompson et al. (2007) surveyed middle school students to determine social norms by asking what students thought their peers consumed for lunch. Using this information, the authors assessed the influence of social norms on students' fruit and vegetable consumption and found a positive correlation between positive social norms towards eating fruits and vegetables (i.e., the perception that other students eat their fruits and vegetables) and higher overall consumption (Thompson et al., 2007).

Social Structure, Policy, and Systems

The outermost layer of influence includes social structure, policy, and systems (McLeroy et al., 1988). This level involves interpreting and enforcing any policies from the local, state, or federal level. In addition to laws, policy includes guidelines and programs, such as the Dietary Guidelines for Americans and the National School Lunch Program. Since this is the outermost layer of the SEM, it influences all other layers (Gregson et al., 2001).

Policies and laws play a major role in the school environment and can provide a structure to support healthy behaviors. Approaching obesity prevention interventions through policy, systems, and the environmental level provides a greater potential for impact than an individual approach (CDC, 2017b).

School wellness policies (SWPs) are an example of a policy that is designed to promote a healthy school environment and address the issue of childhood obesity. Any school that participates in the National School Lunch Program is required to have a SWP. Although this is a national policy, it is under the jurisdiction of a local educational agency so that it can be adapted to meet the needs of each school (USDA, 2017b).

Policy, system, and environmental changes are a necessary part of successful and sustainable health promotion and disease prevention interventions (Walkinshaw et al., 2018). Walkinshaw et al. (2018) conducted an evaluation to assess the ways in which changes in policy, system, and environment (PSE) influenced the amount of fruits and vegetables purchased and consumed from farmers' markets by participants of the Supplemental Nutrition Assistance Program- Education (SNAP-Ed) program in Washington state. The study concluded that increasing nutrition education, creating multi-sector partnerships (such as with local extension programs), and encouraging changes in policy were successful in increasing fruits and vegetables purchased and consumed from farmers' markets. Ultimately, creating changes at the policy and organizational levels, lead to behavior change at an individual level (Walkinshaw et al., 2018).

As seen above, all five layers of SEM play a role in child health behaviors. It is important to recognize that, although all spheres of influence can have negative impacts on health behaviors, "resources during adolescence, including psychosocial characteristics, social support from peers, parents, and schools, and family of origin characteristics are protective of adolescents' healthy behaviors, and these protective

effects persist through young adulthood” (Frech, 2012, pg. 66). The following sections discuss in more detail factors influencing childhood obesity at various levels of SEM.

Key Stakeholders’ Role in Child Health Behaviors

As previously discussed, peers, parents, and teachers and other school faculty all have influence on children’s health behaviors. A study conducted by Pearson et al. (2010) analyzed the relationship between 1,850 adolescents’ consumption of fruits, vegetables, and energy dense foods and individual, social, and physical factors over a two-year period and found an increase in fruit and vegetable consumption for adolescents who experienced modelling of healthy eating (Pearson et al., 2010). A systematic review conducted by Sisson et al. (2016) noted that future obesity prevention interventions should involve a multi-level approach, such as the SEM, and should focus on incorporating parents and school teachers and staff.

Parent Influence on Child Health Behaviors

A parent or caretaker influences a child’s dietary habits early in life. When children are old enough to determine their own food choices, parents still influence their children’s behaviors through modeling (Anzman et al., 2010) which can have positive changes in fruit consumption in adolescence (Pearson et al., 2010). This mirrors the results from De Bourdeaudhuij and Van Oost (2000) who found that family modeling was a significant determinant for adolescent fat, fruit, vegetable, soft drink, and snack consumption.

Modeling healthy behaviors may be related to parents’ ability to recognize obesity in their children and the extent to which they think obesity is a risk for future health

concerns. In a study conducted by Baughcum et al. (2000) only 21% of mothers were able to correctly identify their child as overweight and only two thirds of those mothers felt that it was a concern. This lack of ability for parents to recognize overweight and obesity was also seen at a larger level. In a recent statewide poll, a large majority of the parents (74%) were concerned about the prevalence of childhood obesity, but only 25% believed that obesity was a local problem (Hildebrand et al., 2018). Parents who perceived their child to have a problem with weight were more likely to be motivated to make and maintain changes (Rhee et al., 2005).

Parents must be able to both accurately identify their child as overweight and be concerned with the associated health risks to take action and play a role in childhood obesity prevention (Towns & D'Auria, 2009). When families were involved and become key stakeholders in obesity treatment for their child, the program was much more successful and sustainable (Epstein et al., 1981; Epstein et al., 1998; Golan & Crow, 2004), therefore it is essential for parents to realize their ability to positively affect their child's health (Neumark-Sztainer, 2005).

A systematic review conducted by Schlechter et al. (2016) suggested that interventions that directly involve parents, such as educational courses or counseling sessions, may be more effective than interventions that indirectly involve parents. The difference in effectiveness may be due to direct interventions requiring parents to be present and aware of the activity, whereas indirect interventions do not typically account for whether the intervention was received and enacted on the child (Schlechter, 2016). These findings are supported by a systematic review and meta-analysis conducted by Delgado-Noguera et al. (2011), that found significant increases in fruit and vegetable

consumption in children when the intervention included a parental component, although only two of the 19 studies included a parental component.

School Faculty Influence on Child Health Behaviors

Teachers and other school faculty spend up to a third of the day with students, and therefore have a unique position of influence. In addition to having direct contact with the student, faculty also have contact with the student's parents, which can allow additional influence (Patino-Fernandez et al., 2013).

The Children's Healthy Living Program conducted an intervention in 23 Head Start pre-school classes to assist teachers in nutrition and physical activity promotion in the classroom and to implement the SWP. The intervention targeted teachers at multiple levels by offering education on healthy habits and the benefits of adequate physical activity and nutrition for both teachers and students. The program also strongly encouraged teachers to eat meals with their students and discuss the benefits of the different foods to model healthy eating. The researchers concluded that teachers who incorporated more personal health behaviors (physical activity, knowledge about nutrition, positive dietary habits, etc.) and stronger beliefs about the importance of child nutrition had higher levels of success in their classroom (Esquivel et al., 2016). These findings emphasize the potential role teachers can play in children's health behaviors, but also show a need for teacher buy in and knowledge over the impact of child nutrition for a successful intervention (Esquivel et al., 2016). Teachers and cafeteria staff can also influence student consumption of fruits and vegetables by simply encouraging and prompting them to try foods (Schwartz, 2007; Jamelske & Veron, 2018).

School's Role in Health Promotion and Obesity Prevention

The school system is a unique environment for health promotion and obesity prevention because 95% of children are enrolled (USD Education [USDE] National Center for Education Statistics [NCES], 2018) and some children consume up to two-thirds of their daily intake from school meal programs (Story et al., 2006). Schools can help students establish positive lifelong behavior patterns early in life (CDC, 2018). This is important because it is easier to establish positive health behaviors during childhood than to change a negative health behavior later in life (CDC, 2018). As such, the CDC (2018) suggests it is the role and responsibility of the school to address health.

This role of the school is supported by a position statement that was published from the Academy of Nutrition and Dietetics, Society for Nutrition Education and Behavior, and School Nutrition Association, which concluded that schools can play a major role in reversing obesity trends and promoting health through child nutrition programs, SWPs, and nutrition education (Hayes et al., 2018) and that “schools and communities have a shared responsibility to provide students with access to high-quality, affordable, nutritious foods and beverages” (Bergman, 2010). Meeting these roles and responsibilities is best achieved through school policies and programs (Wechsler et al., 2004).

These statements show the need for collaboration between schools, parents, and the community to provide students with an optimal health environment. This shared responsibility highlights the interaction of multiple layers of the SEM, which has shown to be more successful in improving health behaviors than targeting one area (Esquivel et

al., 2016). One such change that has been implemented in schools, is the requirement of a school wellness policy (SWP) that clearly outlines standards for nutrition services, nutrition and physical education, and communication with parents and the community (USDA, 2017b).

Parent's Perception of Schools Role in Childhood Obesity

Parents agree that schools should have responsibility in preventing childhood obesity, although the level of agreement varies in rural and urban areas. Stalter et al. (2011) found that 93.8% of surveyed parents in an urban school area felt the school should address issues of overweight and obesity, compared to 75% of surveyed parents in a suburban school area (Murphy & Polivka, 2016). A recent study conducted by Hildebrand et al. (2018) found similar results reporting that parents in urban locations had significant higher mean ratings that the school was responsible for providing specific foods to promote health and reduce obesity when compared to parents in rural locations. Parents in urban locations had significantly higher mean ratings that it is feasible for the school to change the food served to meet nutrition guidelines for health promotion and obesity prevention and that the school should provide healthy food when compared to parents of rural locations. Regardless of location, parents that felt obesity was a problem in their child's school had significantly higher mean ratings that the school was responsible for providing foods to promote health and reduce obesity and requiring teachers to model healthy eating patterns than parents who did not feel obesity was a problem in their child's school (Hildebrand et al., 2018).

National School Lunch Program

The National School Lunch Program (NSLP) is a federally funded program, established through legislation and regulated through policy from the Food and Nutrition Service (FNS) within the United States Department of Agriculture (USDA). It was established in 1946 by President Harry Truman to provide subsidized meals to children attending public or nonprofit private schools (USDA FNS, 2018). In 2016, over 100,000 schools participated in the NSLP, serving an average of 30.4 million children daily totaling about 5 billion lunches annually (USDA FNS, 2018). Of the 30.4 million meals, about 20.1 million lunches were served free, 2 million were served at a reduced rate, and 8.2 million were served at full price (School Nutrition Association, n.d.).

In 2010, the Healthy Hunger-Free Kids Act (HHFKA) was passed, authorizing USDA to revise the school meal patterns and nutrition standards (USDA FNS, 2017a). An aim of the act was to address the increasing burdens of childhood obesity and hunger. The resulting regulations, effective January 2012, required schools to increase the amount of fruits, vegetables, low-fat milk, and whole grains while limiting saturated fat, trans fat, sodium, and total calories served at each meal. The changes were designed to reflect the 2010 Dietary Guidelines for Americans. In addition to improving the nutritional quality of meals, the HHFKA also set guidelines for all other foods sold in the school during school hours, including al la carte items and vending machine items. The HHFKA increased the reimbursement rate granted to schools for the first time in over 30 years. Schools were also required to provide easy access to nutrition information for parents to view. The Community Eligibility Provision (CEP) was a part of the HHFKA which

allows schools that fall within a low-income area to offer free meals to all children, without applying for meal eligibility (USDA FNS, 2017a).

Benefits of the School Lunch Program

While a multitude of research has been conducted on the School Breakfast Program, fewer studies have focused solely on the NSLP, although studies have shown that students who participate in the school lunch program are also more likely to participate in the school breakfast program (Bartfield & Kim, 2010).

Increase Academic Performance

While no studies were found that directly linked participation in the NSLP with increased academic performance, children who are hungry are more likely to have lower math scores and poorer grades, be tardy or absent from school, experience academic problems, and repeat grades than students who do not experience hunger (Food Research and Action Center [FRAC], 2016b). In addition, students who consume breakfast at school show higher school attendance, higher cognitive performance, and better classroom performance (Bailey-Davis et al., 2013).

Increase Overall Health and Nutrition

Children who participate in the NSLP show a better overall dietary intake compared to children who do not participate, including a higher consumption of fruit, vegetables, and milk (Cullen et al., 2015). Unlike food served through the school, which is regulated for nutritional quality, lunches that are brought from home are not required to meet any nutrition standards. Because of this, they often fall short in providing the

essential nutrients delivered in the NSLP meals. Lunches from home are more likely to be higher in total calories and contain more snack foods, desserts, and sugar sweetened drinks than lunches purchased from the school (Minaya & Rainville, 2016).

Bergman et al. (2014b) conducted a study on lunches of second to fifth grade students who attended Washington state schools. Three hundred forty-four school lunches were analyzed and compared to 276 lunches brought from home. The school lunches were significantly higher in protein, cholesterol, vitamin C, and some minerals such as calcium, iron, and sodium than packed lunches. In contrast, packed lunches were significantly higher in total fat and saturated fat and significantly lower in total calories (Bergman et al., 2014b).

Additional studies found similar results supporting the idea that packed lunches contain significantly more sugar, snack foods, and desserts and significantly fewer fruits, vegetables, and servings of dairy (Hur et al., 2011; Johnston et al., 2012; Caruso & Cullen, 2015). Similar results were found in pre-school and kindergarten lunches with packed lunches being significantly higher in total calories and fat, saturated fat, sugar and lower in protein, fiber, fruits and vegetables, and calcium (Farris et al., 2016).

The lower value of some essential nutrients in packed lunches can be attributed to the lack of variety of food groups generally included in school lunches. Only 27% of third and fourth graders who brought their lunch from home met at least three of the standards for protein, grains, fruit, vegetables, and dairy, which are required in all reimbursable school meals (Hubbard et al., 2014). Romo-Palafox et al. (2015) found that about half of analyzed lunches brought from home did not contain a vegetable while 60

to 70% contained refined grains (versus whole grains), sodium, and saturated fats. In conclusion, students who consume the school lunches are much more likely to meet the recommended USDA school lunch standards, which are based on the national Dietary Guidelines for Americans (USDA FNS, 2017a).

In addition to improvements in daily nutrition intake, overall poor health is reduced by about 29% for children who receive subsidized meals (FRAC, 2016a).

Reduce Food Insecurity

The NSLP acts as a food-insecurity safety net, especially for low-income children. In 2014 and 2015, 84% of food insecure households with children qualified and received free or reduced lunches from the NSLP (USDA Economic Research Service [ERS], 2017). This source of nutrition has been shown to prevent or reduce the negative impact from cognitive delays, social impacts, and malnutrition associated with childhood food insecurity (Bergman, 2014 & USDA ERS, 2017). Consumption of school lunch has been estimated to reduce national food insecurity by more than 3.8% through free and reduced meals (FRAC, 2016a).

Lower Cost

A systematic review done by Mansfield and Savaiano (2017) concluded that, in addition to being more nutritious, lunches from the NSLP were lower in average cost when compared to lunches brought from home. On average, lunches bought from school cost \$1.76 versus \$1.93 for packed lunches. This study was conducted before the HHFKA and did not take the community eligibility from HHFKA into account, which

allows free lunch to all students in schools in which at least 40 percent of students qualify for free and reduced meals (Mansfield & Savaiano, 2017).

Factors Influencing NSLP Participation

Although there are benefits to participating in the NSLP, studies have found a multitude of factors that influence whether a student chooses to participate, including student satisfaction of the NSLP, qualification for free or reduced meals, opportunity to socialize, and perceived meal quality (Bailey-Davis et al., 2013). Additional reasons include personal and social reasons, food preferences, and social stigmas about receiving free or reduced meals (Bailey-Davis et al., 2013). In addition, participation tends to follow a decreasing trend as students' progress from elementary school, having the highest rate of participation, to high school, having the lowest rate of participation (Fox & Codon, 2012).

Student's Satisfaction of NSLP

Ultimately, it is the student that decides whether they will consume the food they are served in a school lunch. Students' satisfaction with the NSLP drives the overall participation rates (Meyer & Conklin, 1998). There are many factors that influence student satisfaction, primarily a student's individual food preference and the attentiveness of the food service staff (Castillo & Lofton, 2012). Furthermore, research has shown that students who consumed the school lunch on a regular basis had higher rates of satisfaction in the program (Meyer, 2005), girls had higher satisfaction than boys (Meyer, 2000b), and satisfaction depended on grade, with a decrease as grade level progressed (Meyer, 2000b; Kjosien et al., 2015). Additional factors that influenced students' overall

satisfaction and participation in NSLP included student's level of hunger, perceived taste of the food, cost, variety within the menu, visual appearance of food being served, and the number of choices offered (Gordon et al., 2007; Meyer, 2000a, 2000b, 2005; Meyer & Conklin, 1998).

Another study done by Wojcicki and Heyman (2006) concluded that, when middle school students were asked about their food preferences and were involved in making changes to their lunch menu, there was a higher participation in NSLP than at schools where students were not involved in the process. School nutrition programs may be able to retain a higher level of participation by allowing students, especially those in higher grades, options and the ability to customize their meal.

Qualification for Free or Reduced Meals

Students who received free or reduced meals had significantly higher odds (OR 5.59, 95% CI 3.03-10.30) of eating school lunch than students who were not receiving free or reduced school lunches (Ohri-Vachaspati, 2014). Similarly, a study by Kjosén et al. (2015) found that students who received free and reduced meals reported higher levels of satisfaction. This increased satisfaction may be attributed to an increase in staff attentiveness from developed relationships through consistent contact, which has shown to be associated with increase satisfaction in the program (Kjosén et al., 2015).

Socialization

Students who participated in the school lunch program said two of the top five reasons they eat the school lunch were "I get to socialize with my friends" and "I get to sit with my friends" (Smith et al., 2015). Making the cafeteria a pleasant place for

students to eat could help schools retain a higher NSLP participation rate (Moore et al., 2010).

Parent Perception of NSLP

Parent perception of the school lunch has been shown to be a significant indicator of whether their child participated in the school lunch program, even after adjusting for demographic variables (Ohri-Vachaspati, 2014). Parents' perception of the NSLP was primarily driven by whether they perceived the meals to be of high nutritional quality (Ohri-Vachaspati, 2014). When parents perceived the school lunch to be somewhat healthy or very healthy, students were more likely to consume the school lunch than students whose parents did not perceive the school lunch to be as healthy. Although these results were significant, the majority of the sample that was used were parents of low-income, minority children, so the results may not be reflective of populations with low percentages of free and reduced students (Ohri-Vachaspati, 2014).

In addition, parents reported that nutritional quality, variety of food, and taste preference were motivational factors for packing their child's lunch versus having the child eat school lunch regardless of whether the school had high or low free and reduced lunch rates. Parents that chose to buy school lunch reported motivational factors of saving time and convenience (Farris et al., 2016).

Although few studies have been conducted on parents' perception of school lunch, there are multiple studies that have been conducted on parents' perception of the school breakfast program. A study of 488 surveys collected from parents in 29 different school districts found that few parents (5.6%) felt that the breakfast that was served at

school was healthier than the breakfast their child was receiving at home, but agreed that there were some benefits such as convenience, reducing stress during the morning, and allowing their child to not be hungry in the morning. In addition, this study found that children were 10 times more likely to consume school breakfast if their parent saw that there was some benefit compared to parents that saw no benefits (Spruance et al., 2018).

These studies show that parental perception of school meals can play a role in participation rates for students and that parents' main concern is the nutritional quality of the school meals. Considering that school meals are generally of higher nutritional quality than lunches brought from home (Minaya & Rainville, 2016), educating parents on nutritional quality of school meals may increase parent satisfaction.

Previous Interventions to Increase NSLP Participation

Few studies have focused solely on increasing NSLP participation. One intervention conducted by Goldberg et al. (2009) in elementary schools in Massachusetts was able to increase the amount of NSLP participation, decrease food waste, and increase the demand for fruits and vegetables by increasing collaboration with key community members, teachers, administrators, and local media. The intervention focused on changing school meals, providing professional development for food service staff, and increasing communication strategies. In addition to increased community engagement, schools conducted food tastings, marketed nutrition information through classroom education and posters, and offered fruits and vegetables more often during breakfast and lunch (Goldberg et al., 2009). Another intervention showed that emphasizing healthy

eating was linked to creating a nutrition environment at school that positively influenced students' eating behaviors and diet (Gosliner et al., 2011).

These studies suggested that increasing collaboration between teachers, administrators, and the local community and conducting food tastings, utilizing posters to market nutrition education, and offering more fruits and vegetables can have a positive outcome on students eating habits and the NSLP participation.

School Parent Communication

While a parent's perception of school meals is a predictor of their child's participation, many parents don't personally participate in the NSLP (Nguyen, 2018). As such, schools must find other methods to communicate the benefits of school meals to parents. For example, schools may utilize multiple different indirect methods of communication with parents. Few studies have been conducted on the effectiveness of different communication avenues, especially when focusing on health behaviors and nutrition education in a school setting. One study, conducted by Kipping et al. (2012), assessed the effectiveness and response rate of different forms of communication between schools and parents of nine to ten year-old students. The goal of the study was to engage and educate parents in a school-based obesity prevention program by utilizing different routes of communication, such as a newsletter, school events, and homework assignments that were to be done collectively by parent and child. Overall, the parents preferred the homework assignments, which had an 84% completion rate, with higher completion rates for the assignments with activities that involved both the child and parent. This was preferred over the organized events and workshops due to convenience

and lack of interference with other time commitments such as work. Ultimately, Kipping et al. (2012) reported the homework assignments were useful in involving parents in the program.

In focus groups of 64 parents of elementary school children from low-income schools, interactive activities were the preferred method of communication followed by pamphlets or brochures, a CD or DVD with information (Slusser et al., 2011). Parents have also reported a school newsletter, email, parent teacher meetings, and a cookbook were all good methods of communication (Kipping et al., 2012) and that food vouchers and prizes, including food and kitchen items, were good incentives for participation (Slusser et al., 2011). Goldberg et al. (2009) suggested that increasing family participation in an intervention is best accomplished by multiple methods of communication. This information is insightful considering that 90% of the parents were interested in nutrition education with basic nutrition information as the highest topic of interest (Slusser et al., 2011).

Based on these studies, there are multiple different avenues of communication between school and parents that are generally well received and that may be effective for health-related messages. These methods include interactive take home activities, handouts, and newsletters, but utilizing multiple methods increases family participation.

Cooking for Kids

Cooking for Kids (CFK) is a program that provides culinary training for Child Nutrition Professionals (CNPs) in the state of Oklahoma. It is funded by the Oklahoma Department of Education Child Nutrition Services using USDA flow-through funds. The

program was created to assist schools in addressing challenges and implementing strategies to better meet the meal pattern updates that resulted from the HHFKA. The program aims to increase participation in the NSLP, increase the amount of fresh foods served in the cafeteria, and increase the amount of public support for child nutrition programs within the schools (Cooking for Kids, n.d.).

During the months of June and July, skill development trainings are held for Oklahoma CNPs to gain basic culinary skills needed to prepare more fresh foods. Trainings focus on knife skills, flavoring techniques, cooking techniques, professionalism, and lunch room efficiency to improve food quality and customer service, which are the top two factors that attribute to low participation in middle school, junior high, and high school student (Castillo & Lofton, 2012). In addition to skill development training, CFK offers a culinary management training to improve menu planning and procurement for Child Nutrition Directors (CNDs). Both training opportunities provide attendees with federally required continuing education hours.

School districts that attend both the skill development training and culinary management training are eligible for a yearlong chef consultation in which a chef works directly with the school district to address specific issues and further incorporate the topics covered during summer trainings.

The Cooking for Kids trainings and chef intervention alone were not enough to significantly increase lunchroom satisfaction for any of the stakeholder groups (Nyugen, 2018) because they do not address the lack of support previously reported by food service staff. Support from other key stakeholders including school faculty and parents, are

necessary to make new policies more successful (Slawson et al., 2013). During the 2017-2018 school year, an additional community engagement component of CFK was offered to schools participating in the chef consultation portion of the program. This component aimed to increase parent and faculty satisfaction with the NSLP. Since these key stakeholders influence students' decisions, an increase in satisfaction may ultimately lead to an increase in student satisfaction, and therefore, student participation in the NSLP.

Summary

Childhood obesity is a rapidly growing problem in the United States and has many negative outcomes during childhood as well as during adulthood (Halfon et al., 2013; Sahoo et al., 2015; WHO, 2018). Schools are a unique platform to affect this growing concern since 95% of children attend school (USDE, 2018). One way that schools can address childhood obesity is through increasing participation in the NSLP, which can improve the nutritional status of students and reduce the rate of obesity (FRAC, 2016a). To successfully increase participation, an intervention must address the many factors that affect participation including student satisfaction of the NSLP (Meyer & Conklin, 1998), taste and food quality, cafeteria staff attentiveness (Castillo & Lofton, 2012), and parent perception of school meals (Ohri-Vachaspati, 2014).

CFK addresses food quality and staff attentiveness through culinary trainings for CNPs, but there is still a need to address addition layers of the SEM by increasing community engagement. Previous studies have demonstrated that increasing communication between schools and families positively impacted students' health behaviors (Goldberg et al., 2009; Slusser et al., 2011; Kipping et al., 2012). This was

achieved through multiple and different communication methods, including but not limited to interactive activities, handouts, and newsletters. In addition to parents, school faculty have also shown to influence students' health behaviors. In conclusion, a combination of intervention techniques targeted at students as well as parents, faculty, and school nutrition professionals can lead to support for healthy eating behaviors (Byker et al., 2013) and increased participation in the NSLP.

CHAPTER III

METHODS

Purpose

The primary purpose of this study was to increase key stakeholders' (i.e., parents and faculty) awareness and knowledge of the benefits and role of NSLP in providing healthy foods and assess change in satisfaction about the NSLP. A secondary purpose of this study was to determine if the extent of satisfaction differed based on parents' and faculties' perception of childhood obesity and the role of the school to offer food that promotes good health. This project was approved by the Institutional Review Board at Oklahoma State University (Appendix A).

Study Sites

Fifteen schools in the state of Oklahoma that participated in the chef consultation phase of the Cooking for Kids (CFKs) program during the 2017-2018 school year were

eligible to participate in the study. A school was eligible for the chef consult program if school nutrition staff completed both the CFK skill development training and culinary management training during summer 2017. The sample included a combination of elementary, middle, and high schools. Table 3.1 shows the grade levels, number of students enrolled for the 2017-2018 school year, geographical location, and agreement to participate in the CFK community engagement intervention. Geographical location was determined based on school location in relation to interstate 35 (east or west) and interstate 40 (north or south).

Table 3.1: Qualifying school descriptive characteristics and participation

School	Grade level	Number of students enrolled	Geographical location	Participation in intervention
School 1	PreK– 8th	232	NW	Yes
School 2	5 th - 8 th	350	NE	No
School 3	6 th - 8 th	606	NE	Yes
School 4	6 th - 12 th	378	SE	Yes
School 5	K- 5 th	416	SE	Yes
School 6	5 th - 12 th	400	SW	Yes
School 7	K- 8 th	167	NW	Yes
School 8	7 th - 8 th	398	SE	Yes
School 9	K- 8 th	221	SE	Yes
School 10	4 th - 5 th	450	SE	Yes
School 11	K- 12 th	-- ^a	NE	No
School 12	PreK- 8 th	235	SE	Yes
School 13	K- 12 th	358	NW	No
School 14	PreK- 12 th	450	NW	Yes
School 15	PreK- 12 th	280	NE	Yes

^aNo information reported

NE= northeast; NW= northwest; SE= southeast; SW= southwest

Description of Intervention

Prior to the beginning of the 2017-2018 school year, CFK staff contacted the 15 eligible Child Nutrition Directors (CNDs) regarding their interest in participating in the year-long communication and community engagement interventions. Of the 15, 12 schools agreed to participate. Consenting CNDs were then asked to create a partnership with an administrator at their school to assist with intervention implementation and survey distribution.

CFK provided the 12 consenting schools with resources to implement a communication and community engagement intervention. The intervention was conducted simultaneously with the year-long chef consultation. The kit was organized by month and included different activities that incorporated multiple communication methods shown to be effective in existing literature (Goldberg et al., 2009; Kipping et al., 2012 & Slusser et al., 2011). The research team contacted each CND throughout the year with monthly updates and reminders related to each new activity. Although CFK provided the intervention activity instructions and materials, each school was responsible for implementation. The following materials were provided to schools.

September

Pre-surveys were sent to the CND of each school for all elementary and secondary students (Appendix B and D respectively), parents/guardians (Appendix F), and faculty (Appendix H) to be distributed and collected before the intervention period. A primary local newspaper was determined by the CND to which the research team sent a press release (Appendix J) regarding the school's participation in the CFK program and

chef consultation. If the CND did not provide a local newspaper, the research team looked up and contacted a local paper.

October

A parent fact sheet (Appendix K) and a faculty fact sheet (Appendix L) that included general information about CFK, the importance of school meals, and how to support a healthy school environment was printed and shipped to each school to be distributed. The parent fact sheet was distributed to parents through their student.

November

Schools were instructed to conduct a taste testing for a honey lemon carrot recipe utilized during the summer culinary trainings. Along with the tasting, schools sent a handout (Appendix M) of the recipe home to parents and posted a video of how to make the recipe on their social media accounts.

December

Since students were not in school for a portion of December, a take home activity created by the USDA (Appendix N) related to school lunches and Myplate was sent home with the students to be done together with their parent or guardian.

In addition, a social media family recipe contest (Appendix O) was conducted in which a student and their family prepared a favorite healthy holiday recipe, posted a picture of it on social media, and added the hashtag #cookingforkidsok and tagged their

school. The social media contest was incentivized with a chance to win an Instapot and a Best Bites cookbook.

January

Schools invited local community “celebrities”, such as policemen, mascots from sports teams, or any familiar local face, to eat the school lunch in the cafeteria (Appendix P).

February

A social media contest (Appendix Q) was held for teachers and administrators to eat school lunch, take a photo, and post it on social media tagging CFK and their school. Teachers and staff were incentivized with a chance to win a YETI water bottle and a Best Bites cookbook.

In addition, schools were encouraged to conduct a taste testing for a roasted red potato recipe from the summer culinary skills trainings. Schools sent a handout (Appendix R) of the recipe and posted a video of how to make the recipe on their social media accounts.

March

Schools conducted their final taste test with an apple vinaigrette and kale salad recipe from the summer culinary skills training. Schools sent a handout (Appendix S) of the recipe and posted a video of how to make the recipe on their social media accounts.

April

A junior chef recipe contest held with the help of the local consulting chef (Appendix T). For the event, schools had students submit their favorite healthy recipe that could be made in under an hour. The consulting chef and CND selected up to eight students to participate in the competition in which each student made their recipe. A panel of local judges selected the winner of the competition.

May

Post-surveys were sent to the schools to be distributed and collected from all students (Appendix C & E), parents/guardians (Appendix G), and faculty (Appendix I). An additional survey was sent to each CND of participating schools (Appendix U). Surveys were provided in both an online and paper format.

Data Collection and Satisfaction Survey

Change in satisfaction was measured using surveys designed for each of the stakeholder groups: elementary students, middle school/high school students, parents, and faculty. All surveys were adapted from the Institute of Child Nutrition Survey Middle/Junior High School Student Participation Survey Section I which was originally designed as a benchmark of student's satisfaction in the NSLP and is generalizable regardless of school district size (Castillo & Lofton, 2012). Seven of the 24 questions

related to satisfaction were used. Four of the 24 questions were simplified to create a survey for elementary students. In addition, parent and faculty surveys included two additional questions regarding childhood obesity and the role of the school in health promotion. These questions were previously used by Hildebrand, Gates, and Betts (2018) in a statewide telephone survey of Oklahoma parents.

The CND and administrative partner were responsible for administering and collecting surveys. Each school was sent pre-surveys (Appendices B-E) at the beginning of the school year, followed by post-surveys (Appendices P-S) at the end of the year in a PDF and an online Qualtrics format (Qualtrics, 2015). Each CND was contacted with an e-mail reminder and two additional telephone calls in the two-week time period between when the surveys were sent to the school and when they were expected to be returned. Schools that utilized paper surveys were provided with prepaid shipping labels.

Surveys were anonymous but identified by school. Online survey responses were exported from Qualtrics into SPSS data analysis software program (IBM SPSS Statistics, Version 20; Copyright ©). Paper copies of the survey were manually entered in SPSS data analysis software program (IBM SPSS Statistics, Version 20; Copyright ©).

Elementary Survey

Elementary students responded to the four statements adapted from the Middle/Junior High School Student Participation Survey “the food tastes good”, “the cafeteria has food I like”, “the food looks good”, and “the cafeteria is a fun place to be” (Castillo & Lofton, 2012). Response options used a three-point Likert scale of faces with a frown corresponding to no, an indifferent face corresponding to a maybe, and a smiley

face corresponding to yes. Students also reported what grade they were in. The pre- and post-surveys were identical.

Middle School/ High School Survey

Middle and high school students responded to seven statements of food preference factors from the participation survey designed by the Institute of Child Nutrition (Castillo & Lofton, 2012) to gauge satisfaction. These statements included “the food is fresh”, “the food tastes good”, “there is a variety of food choices”, “the menus offer healthy choices”, “the food looks appealing”, “the menu has food I like”, and “I get to socialize with my friends”. Response options included a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5). Additional demographic questions were added to determine grade and how frequent the student consumed school lunch. The survey ended with a blank text box for any additional comments. The post-survey was identical to the pre-survey.

Parent Survey

Parents responded to the same seven satisfaction questions on the middle and high school survey as well as two questions from Hildebrand, Gates, and Betts (2018) to assess perception of childhood obesity “childhood obesity is a problem in my child’s school” and the role of the school in health promotion “it is the role of the school to offer food that promotes good health”. Response options used a six-point Likert scale ranging from strongly disagree (1) to strongly agree (5) and an option for I don’t know (6). Four questions were added to assess how often their child ate the school lunch, what grade their child was in, how often they ate school lunch with their child, and their education

level. At the end of the survey, a text box was left blank for additional comments. The post-survey included all questions in the pre-survey as well as questions related to the chef consultation “were you aware that a chef was working with your school lunch program over the past school year”, and “if yes, how did you hear about it”. In addition, parents were asked to identify which communication interventions “did you see or hear about any of the following related to national school lunch program” with answer choices that correlate with each of the intervention activities: “handouts”, “celebrity day”, “recipe contest”, “social media contest”, “school lunch hero day”, “other”, and “neither” to determine which if any of the interventions was carried out successfully.

Faculty Survey

Faculty, defined for this project as teachers and administrators, responded to the same seven satisfaction questions and statements on childhood obesity and the role of the school in health promotion as parents, but used a five-point Likert scale, rather than a six-point scale. The excluded option was “I don’t know”. One additional question was added to determine how often the faculty member consumed the school lunch. The post-survey reflected all the changes that were made to the parent post-surveys and included a blank text box for any additional comments.

CND Survey

Child nutrition directors were sent a survey after the post-surveys were collected from other stakeholders. The survey asked which school district they were employed by, which of the community engagement activities they utilized during the school year, what goals they felt they achieved as a result of the chef consultation, their perception of

childhood obesity at their school, their perception of the role of the school in health promotion, and if there is anything else they wanted to share about their experience. The question related to which community engagement activities they participated in had more specific answer choices than the parent and faculty surveys, answers included “parent handout”, “teacher and staff handout”, “celebrity day”, “social media recipe videos”, “teacher and staff social media contest”, “student recipe contest”, “social media contests”, “taste testing”, “MyPlate handout”, “family social media contest”, and “other”.

For analysis related to the communication interventions and satisfaction, the following exclusion criteria were also used.

Data Cleaning, Coding, and Variable Calculations

Data from the surveys were entered into Statistical Package for Social Sciences (SPSS) (IBM SPSS Statistics, Version 20; Copyright ©). Surveys with more than one missing satisfaction score (question 1-7) or parent and faculty surveys that did not include a response for “childhood obesity is a problem at my school” or “it is the role of the school to provide food that promotes health” were excluded from all analysis. At the school level, surveys were eliminated if the school did not submit both pre- or post-responses. For schools with unequal pre- and post-response rates, defined as a post-survey response less than 50% of their pre-survey response, an independent sample t-test was conducted to test for equality of variance. Schools that failed the Levene’s Test for equality of variance were excluded from analysis (Washburn, personal interview, 2018).

The parent/guardian surveys were recoded to collapse the “I don’t know” (6) responses with “neutral” (3) responses for all satisfaction variables. For parents, faculty

and middle school/high school groups, total satisfaction was calculated by adding the seven satisfaction questions together and dividing by seven

$((Q1+Q2+Q3+Q4+Q5+Q6+Q7)/7)$ for middle/high school, parent, and faculty surveys.

Total satisfaction for elementary surveys was calculated by adding together the four satisfaction questions and dividing by four $((Q1+Q2+Q3+Q4)/4)$.

Survey items assessing parent/guardian perceptions of childhood obesity as a problem and the role of the school in providing healthy food were recoded to collapse the “I don’t know” (6) responses with “neither” (3) responses. Then, for both parent/guardian and faculty surveys, responses to the two items (childhood obesity and role of school) were recoded into 3 categories. Strongly disagree (1) and disagree (2) were coded as disagree (1); neither (3) was recoded as neither (2); and agree (4) and strongly agree (5) were coded as agree (3).

To account for differences between schools and unpaired cases, the mean for pre-implementation satisfaction scores for each school was calculated and used as the pre-satisfaction score for each post-intervention case within the school. Actual post-intervention satisfaction scores were kept as individual scores for each case.

Post-surveys for the parent and faculty groups assessed the respondents’ awareness of each communication activity. If the respondent marked an activity, it was coded “1” for awareness and if the activity was not marked it was coded “0” for not aware. The number of known interventions was calculated for parents and faculty by summing the interventions activities.

To determine the number of interventions a CND reported for parents and for faculty, Q8 of the CND survey (Appendix U) was used. Response to “social media recipe video” and “taste tests” were recoded as “other” for CND surveys to mirror intervention activity responses from parents and faculty surveys in which no direct information was collected for those activities. Additionally, “social media contest” was not used to calculate total CND intervention activities since the survey included options for each individual social media contest (i.e., “teacher and staff social media contest (February)” and “family social media contest (December)”). Lastly, since the parent surveys listed “handout” as one option and did not specify whether it was the hand out in October or December, “parent handout (October)” and “MyPlate Handout (December)” were coded as “parent handout”. If the CND marked an activity, it was coded “1” for utilization and if the activity was not marked it was coded “0” for no utilization.

To calculate the total number of CND parent related interventions the sum of “parent handout”, “celebrity day”, “student recipe contest”, “family social media contest (December)”, and “other” was calculated. To calculate the total number of CND faculty related interventions the sum of “teacher and staff handout (October)”, “celebrity day”, “teacher and staff social media contest (February)”, “student recipe contest”, and “other” was calculated. Both parent and faculty CND reported interventions were calculated from 0-5. No other information from the CND survey was utilized for analysis.

Statistical Analyses

Frequency statistics were used to determine the number and percentage of stakeholders who reported awareness of each of the various activities implemented by the

respective school. Chi-square analyses were used to determine if there were differences in stakeholder demographic characteristics between the pre- and post-respondents. Frequency statistics were also used to determine the number and percentage of CNDs who reported implementing each activity.

Due to limited variability of the three-point Likert scale used to assess satisfaction for elementary students, a non-parametric Wilcoxon Ranks Test was conducted to determine if the one-year intervention influenced change in satisfaction for each satisfaction variable and total satisfaction. For the other stakeholder groups, independent sample t-tests were used to determine if the one-year intervention influenced change in satisfaction. Total satisfaction was used as the dependent variable and time of survey (pre = 1 or post = 2) as the independent variable. To further investigate satisfaction, independent sample t-tests were conducted to assess differences in mean scores for each of the items comprising the total satisfaction scores.

One-way ANOVA tests were conducted to compare satisfaction among parents and faculty who agreed, disagreed or were neutral related to 1) childhood obesity being a problem in their {child's} school; and 2) the role of the school to provide healthy food. Total satisfaction from the pre-intervention surveys was the dependent variable and childhood obesity and role of school recoded were the independent variables. If the difference in satisfaction was statistically significant, a Tukey post hoc was conducted to determine which groups were significantly different. Eta squared was calculated by dividing the sum of squares between-groups by the total sum of squares to determine the effect size for each individual satisfaction variable. Effect size of .01 was considered small, .06 was considered medium, and .14 was considered large (Pallant, 2007).

CHAPTER IV

FINDINGS

The data for this chapter were collected from four stakeholder groups: elementary students, middle/high school students, parents/guardians and school faculty who completed pre- and post-intervention surveys. Information about the implementation of the intervention was collected from surveys conducted with participating schools' CNDs.

Survey Response Rates and Stakeholder Demographics

Elementary School

Figure 4.1 shows results the exclusion process of elementary surveys. A total of 869 pre- and 469 post-surveys were submitted for elementary students. Eleven pre- and two post-surveys were eliminated due to missing variables. Three-hundred and three pre-surveys were eliminated due to four schools missing post-response surveys. All remaining schools passed Levene's Test for equality of variance leaving a sample of 555 pre-

and 467 post-surveys for analysis.

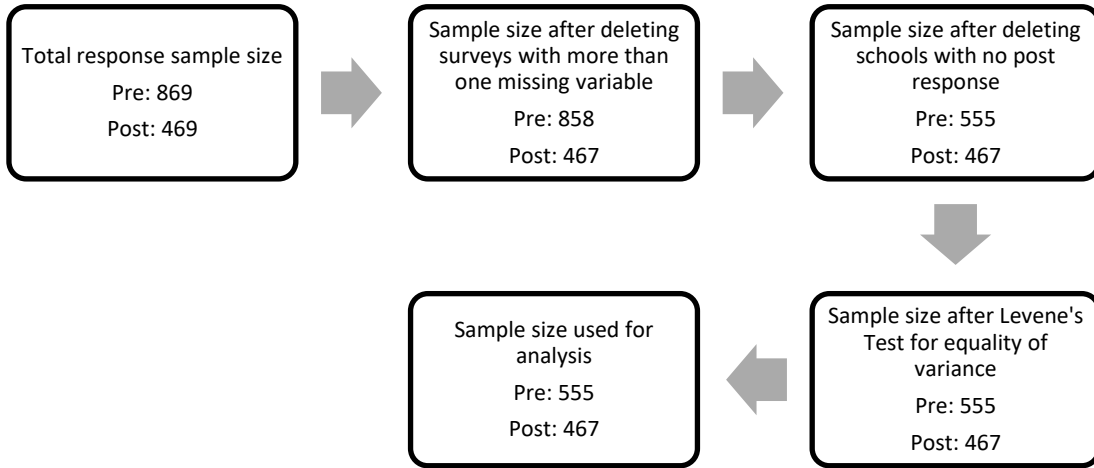


Figure 4.1: Elementary exclusion process

Table 4.1 shows the reported grade level for elementary student surveys. Of the elementary student pre-surveys 26.8% were in 3rd grade, 34.2% were in 4th grade, 36.6% were in 5th grade, and 2.3% did not report their grade. Of the elementary student post-surveys 16.5% were in 3rd grade, 45.8% were in 4th grade, 30.6% were in 5th grade, and 7.1% did not report their grade. A chi-squared analysis revealed a significant difference in grade levels between pre- and post-intervention surveys ($P < .001$).

Table 4.1: Elementary student grade distribution for pre- and post- respondents

Grade Level	Pre-intervention survey (n= 555)	Post-intervention survey (n= 467)	P-value
3 rd Grade	26.8% (n= 149)	16.5% (n= 77)	.001*
4 th Grade	34.2% (n= 190)	45.8% (n= 214)	
5 th Grade	36.6% (n= 203)	30.6% (n= 143)	
No grade reported	2.3% (n= 13)	7.1% (n= 33)	

* Statistical significance = $P < .05$

Middle/ High School

Figure 4.2 shows the exclusion process for middle and high school surveys. A total of 990 pre-surveys and 522 post-surveys were submitted by middle and high school students. Eighteen pre- and 17 post-surveys were eliminated due to missing variables. An additional 47 post-surveys were excluded because they were submitted by 3rd and 4th grade students, which is considered elementary and not middle or high school. Three-hundred fifty-two pre -surveys were eliminated due to three schools lacking a post-intervention response. One school failed Levene’s Test for equality of variance eliminating 73 pre-surveys and 23 post-surveys leaving 547 pre- and 435 post-surveys used for analysis.

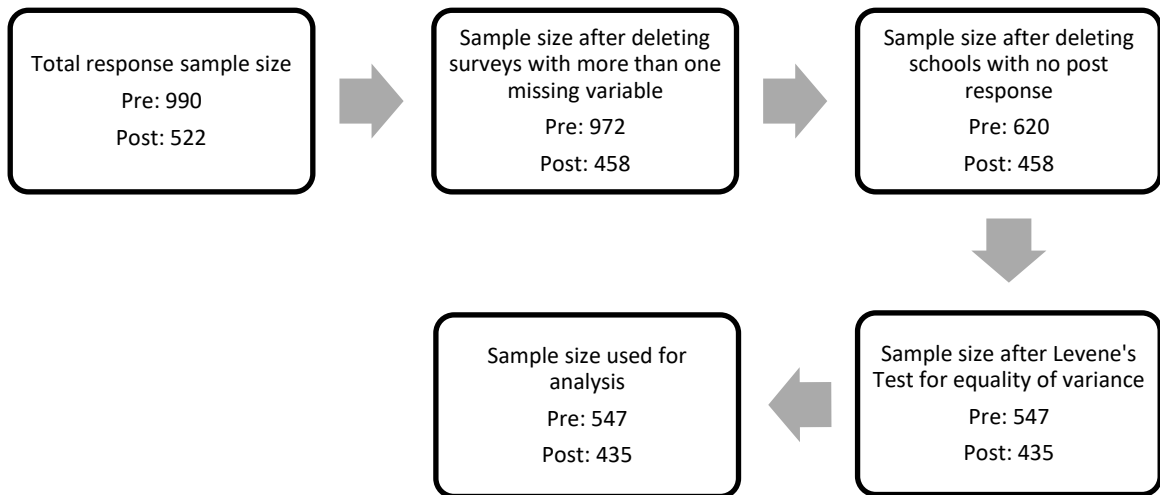


Figure 4.2: Middle and high school exclusion process

Table 4.2 shows descriptive statistics for middle and high school students. A chi-squared analysis revealed a significant difference for both grade level ($P < .001$) and participation frequency ($P = .014$) between pre- and post-intervention survey responses.

Table 4.2: Comparison of middle and high school student descriptive characteristics for pre- and post- respondents

Grade level	Pre-intervention survey (n= 547)	Post-intervention survey (n= 435)	P-value
5 th grade	27.8% (n= 152)	18.6% (n= 81)	<.001*
6 th grade	14.1% (n= 77)	21.4% (n= 93)	
7 th grade	10.4% (n= 57)	22.5% (n= 98)	
8 th grade	8.8% (n= 48)	12.4% (n= 54)	
9 th grade	8.4% (n= 46)	5.3% (n= 23)	
10 th grade	4.4% (n= 24)	9.9% (n= 43)	
11 th grade	13.9% (n= 76)	9.0% (n= 39)	
12 th grade	10.8% (n= 59)	0.7% (n= 3)	
No data reported	1.3% (n= 7)	0.2% (n=1)	
Weekly NSLP participation frequency			
Never	19.2% (n= 105)	13.8% (n= 60)	.014*
1-2 days	17.0% (n= 93)	17.9% (n= 78)	
3-4 days	19.2% (n= 105)	15.4% (n= 67)	
Everyday	43.0% (n= 235)	52.2% (n= 227)	
No data reported	1.5% (n= 8)	0.7% (n= 3)	

* Statistical significance = $P < .05$

Parent and Guardian

Figure 4.3 shows the exclusion process of parent surveys. A total of 747 pre-surveys and 123 post-surveys were submitted by parents and guardians. Due to missing satisfaction variables 64 pre- and 30 post-surveys were eliminated. The remaining 683 pre-surveys were utilized to analyze the relationship between perception of childhood obesity and total satisfaction and the relationship between perception of the role of the school and total satisfaction. Six schools lacked post-surveys which eliminated 284 pre- and 0 post-surveys. One school failed Levene's Test for equality of variance excluding 61 pre-surveys and 4-post surveys. Survey responses, received from 355 pre- and 88 post-

respondents, were utilized to analyze the effect of increased communication on change in satisfaction.

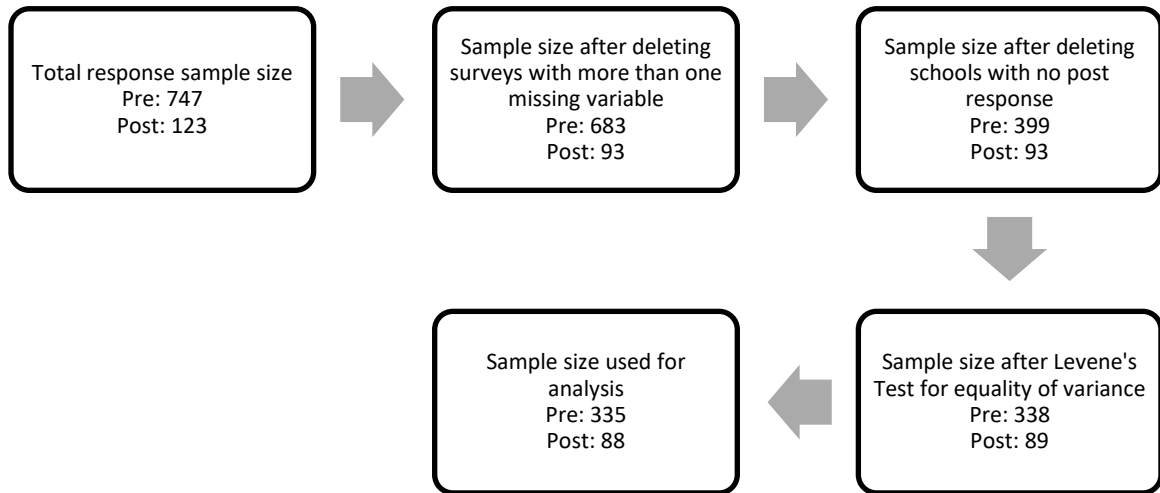


Figure 4.3: Parent and guardian exclusion process

Table 4.3 shows parent descriptive statistics. A chi-squared analysis revealed no significant differences between pre- and post-intervention survey response for child's grade level ($P = .483$), weekly child NSLP participation ($P = .097$), parent lunch participation frequency ($P = .163$), and highest level of parent education ($P = .538$).

Table 4.3: Comparison of parent and guardian descriptive characteristics for pre- and post- respondents

	Pre-intervention survey (n= 335)	Post-intervention survey (n= 88)	P-value
Child's grade level			
Elementary school	69.9% (n= 234)	64.8% (n= 57)	.483
Middle and high school	28.7% (n= 96)	33.0% (n= 29)	
No data reported	1.5% (n= 5)	2.3% (n= 2)	
Weekly child NSLP participation			
Never	9.0% (n= 30)	8.0% (n= 7)	.097
1-2 days	25.1% (n= 84)	15.9% (n= 14)	
3-4 days	21.2% (n= 71)	17.0% (n= 15)	
Everyday	44.5% (n= 149)	59.1% (n= 52)	
No data reported	0.3% (n= 1)	---	
Parent NSLP participation frequency			
I have not eaten in the school cafeteria	43.6% (n= 146)	50.0% (n= 44)	.163
Sometimes (2-3 times a semester)	8.7% (n= 29)	17.0% (n= 15)	
Often (1-2 times a month)	9.3% (n= 31)	6.8% (n= 6)	
Infrequently (once a year)	29.3% (n= 98)	26.1% (n= 23)	
No data reported	9.3% (n= 31)	---	
Parent education level			
Less than high school	2.1% (n= 7)	1.1% (n= 1)	.538
High school graduate or GED	9.3% (n= 31)	12.5% (n= 11)	
Associates degree or vocational/technical school	11.9% (n= 40)	19.3% (n= 17)	
Some college	13.1% (n= 44)	20.5% (n= 18)	
Bachelor's degree	19.7% (n= 66)	36.4% (n= 32)	
Master's degree or higher	10.4% (n= 35)	9.1% (n= 8)	
No data reported	33.4% (n= 112)	1.1% (n= 1)	

* Statistical significance = $P < .05$

Faculty

Figure 4.4 shows the exclusion process of faculty surveys. A total of 163 pre-surveys and 92 post-surveys were submitted by faculty. Three pre- and eight post-surveys were eliminated due to missing variables. Surveys from 160 pre-respondents were used to analyze the relationship between perception of childhood obesity and total satisfaction

and perception of the role of the school and total satisfaction. Surveys from 142 pre-respondents and no post-respondents were eliminated due to three schools lacking post-surveys. Two schools failed Levene’s Test for equality of variance eliminating 18 pre-surveys and two post-surveys. A total of 100 pre- and 82 post-surveys were utilized to analyze the effect of increased communication on change in satisfaction.

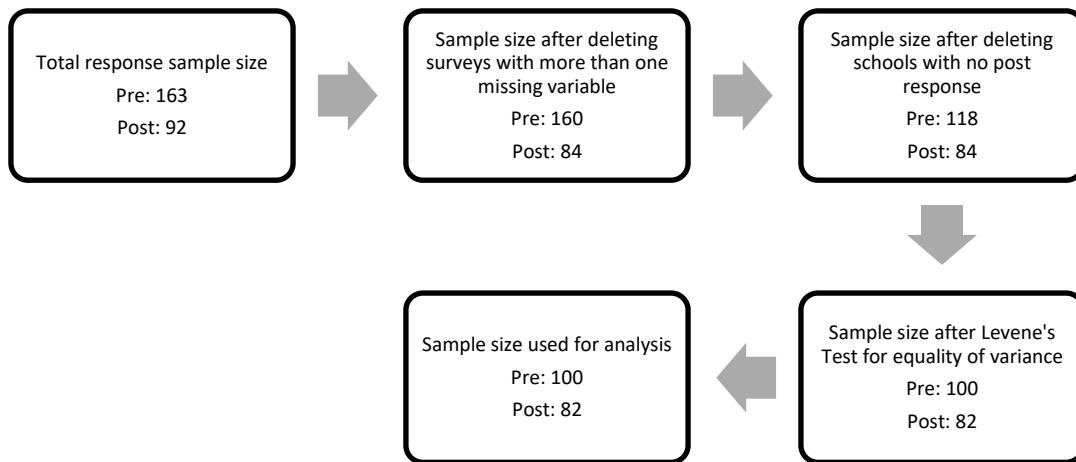


Figure 4.4: Faculty exclusion process

Table 4.4 shows faculty descriptive statistics. A chi-squared analysis revealed no significant difference ($P = .673$) for school lunch participation frequency between pre- and post-survey responses.

Table 4.4: Comparison of faculty descriptive characteristics for pre- and post-respondents

NSLP participation frequency	Pre-intervention survey (n= 100)	Post-intervention survey (n= 82)	P-value
Never	22.0% (n= 22)	23.2% (n= 19)	.673
1-2 days	32.0% (n= 32)	34.1% (n= 28)	
3-4 days	19.0% (n= 19)	12.2% (n= 10)	
Everyday	24.0% (n=24)	26.8% (n= 22)	
No data reported	3.0% (n= 3)	3.7% (n= 3)	

* Statistical significance = $P < .05$

Intervention Implementation and Participation

Surveys were submitted by CNDs from nine of the 12 schools that participated. Table 4.5 shows the breakdown of the number of interventions that parents and faculty were aware of, as well as the number that CNDs reported implementing. The highest number of interventions reported by a school’s CND was eight of the nine, the lowest number of interventions reported was three of the nine with an average of 5.9 reported intervention per CND. Interventions were categorized into two groups based on whether they targeted parents or faculty, with a total of five interventions targeting each.

Throughout the one-year intervention, parents were aware of a maximum of three interventions with a mean report of 0.6 interventions. No known intervention was reported by 56.8% of parents, 27.3% reported one, 11.4% reported two, and 4.5% reported three known interventions.

The number of reported interventions for faculty ranged from 0-4 known interventions with 28.4% reporting no known interventions, 25.9% reporting one, 23.5%

reporting two, 19.8% reporting three, and 2.5% reporting four known interventions. The mean number of observed interventions was 1.4.

Handouts

The intervention utilized two handouts targeting parents and one handout targeting faculty. All nine CNDs reported using both the parent and faculty handouts during the month of October and three CNDs reported using the MyPlate handout in December. Awareness of at least one handout was reported by 27.3% (n= 24) of parents and 45.1% (n= 37) of faculty.

Social Media Contests

Only two CNDs reported conducting the family social media contest in which 4.5% (n= 3) of parents were aware of the contest and participated by posting to Facebook (2) or Twitter (1). Six CNDs reported conducting the faculty social media contest. Of the faculty, 20.7% (n= 17) were aware of the contest, however only two faculty members participated by posting to Facebook.

Student Recipe Contest

Five CNDs reported conducting a student recipe contest in which 41.5% (n= 34) of faculty and 25.0% (n= 22) of parents were aware.

Celebrity Day

Two CNDs reported conducting the celebrity day activity. Only 2.3% (n= 2) of parents and 25.6% (n= 21) of faculty reported awareness of celebrity day.

Other

In addition to specific interventions mentioned above, 4.5% (n= 4) of parents and 8.5% (n= 7) of faculty reported other interventions. For CND surveys, taste test and taste test videos were counted as “other”. All nine CNDs reported utilizing taste tests throughout the year. No specific information was collected regarding which or how many taste test recipes were used. Four CNDs reported using the social media recipe videos along with the taste tests.

None

Awareness of no interventions was reported by 54.5% (n= 48) of parents and 28.0% (n= 23) of faculty. All CNDs that completed the survey reported implementation of at least one intervention.

Table 4.5: Parents and, faculty awareness of intervention activities, and CNDs implementation of intervention activities

	Parent	CND parent related interventions	Faculty	CND faculty related interventions
Aware of chef working with school	52.3% (n= 46)	--	87.8% (n= 72)	--
Handout	27.3% (n= 24)	100% (n=9)	45.1% (n= 37)	100% (n=9)
Recipe contest	25.0% (n= 22)	55.6% (n= 5)	41.5% (n= 34)	55.6% (n= 5)
Social media contest	4.5% (n= 4)	22.2% (n= 2)	20.7% (n= 17)	66.7% (n=6)
Celebrity day	2.3% (n= 2)	22.2% (n= 2)	25.6% (n= 21)	22.2% (n= 2)
Other	4.5 % (n=4)	100% (n= 9)	8.5% (n= 7)	100% (n= 9)
None	54.5% (n= 48)	--	28.0% (n= 23)	--
Total known interventions				
0	56.8% (n= 50)	--	28.0% (n= 23)	--
1	27.3% (n=24)	--	25.6% (n= 21)	--
2	11.4% (n= 10)	33.3% (n= 4)	23.2% (n= 19)	25.0% (n= 3)
3	4.5% (n= 4)	8.3% (n= 1)	19.5% (n= 16)	8.3% (n= 1)
4	--	33.3% (n= 4)	2.4% (n= 2)	25.0% (n= 3)
5	--	--	--	16.7% (n= 2)
No data reported	--	25.0% (n= 3)	1.2% (n= 1)	25.0% (n= 3)

Change in NSLP Satisfaction

Elementary Students

Table 4.6 reports the comparison of means for individual satisfaction elements and total satisfaction for elementary student pre- and post-surveys. After the one-year intervention, the mean total satisfaction of elementary students significantly decreased from 2.4 to 2.2 ($P < .001$). The factors driving the decrease were “the food looks good” ($P < .001$) and “the cafeteria is a fun place to be” ($P < .001$).

Table 4.6: Comparison of elementary students' mean individual satisfaction elements and total satisfaction scores before and after the one-year intervention

	Pre-intervention Survey Mean Score ± S.D. (n= 469)	Post-intervention Survey Mean Score ± S.D. (n= 469)	P-value
The food tastes good	2.4 ± 0.1	2.2 ± 0.7	.370
The cafeteria has food I like	2.5 ± 0.1	2.4 ± 0.7	.129
The food looks good	2.4 ± 0.1	2.1 ± 0.8	<.001 *
The cafeteria is a fun place to be	2.4 ± 0.2	2.2 ± 0.8	<.001 *
Total satisfaction	2.4 ± 0.1	2.2 ± 0.5	<.001 *

* Statistical significance = $P < .05$

Satisfaction scores were based on a 3-point Likert scale from strongly disagree (1) to strongly agree (3).

Middle/High School Students

Table 4.7 reports the comparison of means for each individual satisfaction item and total satisfaction before and after the one-year intervention. There was no significant difference in total satisfaction between pre- and post-survey responses, although there were significant decreases in “the food in the cafeteria is fresh” ($P < .001$) and “the food looks appealing” ($P = .011$). To further understand variables that influence student satisfaction, we looked at satisfaction in relation to participation frequency. All satisfaction scores were significantly higher for students that participated always when compared to those who participated never. Those who participated always had significantly higher total satisfaction compared to students who participated sometimes (1-2 days a week or 3-4 days a week) (Appendix V).

Table 4.7: Comparison of middle and high school students' mean individual satisfaction elements and total satisfaction scores before and after the one-year intervention

	Pre-intervention Mean ± S.D. (n= 435)	Post-intervention Mean ± S.D. (n= 435)	Mean Difference ± S.E.	P-value
The food in the cafeteria is fresh.	3.3 ± 0.3	3.1 ± 1.1	-0.3 ± 0.1	< .001*
The food in the cafeteria tastes good.	3.3 ± 0.4	3.2 ± 1.1	-0.1 ± 0.1	.572
There is a variety of food choices.	3.3 ± 0.4	3.2 ± 1.2	-0.2 ± 0.1	.428
The menus offer healthy choices.	3.6 ± 0.2	3.7 ± 1.0	0.0 ± 0.1	.481
The food looks appealing.	3.0 ± 0.5	2.8 ± 1.2	-0.2 ± 0.1	.011*
The menu has food I like.	3.2 ± 0.4	3.2 ± 1.2	-0.2 ± 0.1	.195
I get to socialize with my friends	4.2 ± 0.3	4.3 ± 1.1	0.1 ± 0.1	.054
Total satisfaction	3.4 ± 0.3	3.4 ± .8	-0.1 ± 0.1	.229

* Statistical significance = $P < .05$

Satisfaction scores were rated on a 5-point Likert scale from strongly disagree (1) to strongly agree (5).

Based on the combined results from Table 4.6 and Table 4.7, the null hypothesis for question 1 stating there will be no change in students' satisfaction after the one-year intervention to increase communication about the NSLP is accepted for middle and high school students. For elementary students, both the null and alternate hypotheses are rejected; in that satisfaction decreased rather than increased.

Parents and Guardians

Table 4.8 shows the average score for each satisfaction factor and total satisfaction before and after the intervention. There was a significant increase in total

satisfaction ($P = .009$) and the individual factor of “the menu has food my child likes” ($P = .012$). Based on these findings the null hypothesis for question 2 is rejected.

Table 4.8: Comparison of parent and guardians’ mean individual satisfaction elements and total satisfaction scores before and after the one-year intervention

	Pre-intervention mean \pm S.D. (n= 88)	Post-intervention mean \pm S.D. (n= 88)	Mean difference \pm S.E.	P- value
The food in the cafeteria is fresh.	3.8 \pm 0.4	3.8 \pm 1.1	0.0 \pm 0.1	.738
The food in the cafeteria tastes good.	3.7 \pm 0.3	3.9 \pm 1.0	0.2 \pm 0.1	.088
There is a variety of food choices.	3.7 \pm 0.2	3.9 \pm 1.1	0.2 \pm 0.1	.101
The menus offer healthy choices.	4.0 \pm 0.2	4.2 \pm 0.8	0.1 \pm 0.1	.148
The food looks appealing.	3.6 \pm 0.4	3.8 \pm 1.1	0.2 \pm 0.1	.110
The menu has food my child likes.	3.7 \pm 0.3	3.9 \pm 1.0	0.3 \pm 0.1	.012*
I feel good about my child eating in the cafeteria.	4.0 \pm 0.5	4.1 \pm 1.0	0.1 \pm 0.1	.230
Total satisfaction	3.8 \pm 0.3	3.9 \pm 0.6	0.2 \pm 0.1	.009*

* Statistical significance = $P < .05$

Satisfaction scores were based on a 5-point Likert scale from strongly disagree (1) to strongly agree (5).

Faculty

Table 4.9 shows the mean scores for each of the satisfaction factors and total satisfaction before and after the one-year intervention for the faculty. Change in faculty satisfaction trended toward a significant increase ($P = .07$). Two satisfaction factors significantly increased, those being “the food in the cafeteria tastes good” ($P = .18$), and “the quality of my lunch experience is good” ($P = .04$). Based on these findings, the null hypothesis for question 3 is accepted.

Table 4.9: Comparison of faculties' mean individual satisfaction elements and total satisfaction scores before and after the one-year intervention

	Pre-intervention mean \pm S.D. (n= 82)	Post-intervention mean \pm S.D. (n= 82)	Standard error mean \pm S.E.	P- value
The food in the cafeteria is fresh.	4.1 \pm 0.4	4.1 \pm 0.8	0.1 \pm 0.1	.607
The food in the cafeteria tastes good.	3.8 \pm 0.4	4.0 \pm 0.8	0.3 \pm 0.1	.018*
There is a variety of food choices.	3.8 \pm 0.6	3.9 \pm 1.0	0.4 \pm 0.2	.190
The menus offer healthy choices.	4.1 \pm 0.3	4.1 \pm 0.8	0.2 \pm 0.1	.385
The food looks appealing.	3.8 \pm 0.3	3.9 \pm 1.0	0.2 \pm 0.1	.215
The menu has food I like.	3.7 \pm 0.5	3.8 \pm 1.0	0.3 \pm 0.2	.116
The quality of my lunch experience is good	3.8 \pm 0.5	4.1 \pm 1.0	0.3 \pm 0.2	.042*
Total satisfaction	3.9 \pm 0.4	4.0 \pm 0.8	0.3 \pm 0.1	.073

* Statistical significance = $P < .05$

Satisfaction scores were rated on a 5-point Likert scale from strongly disagree (1) to strongly agree (5).

Childhood Obesity and Total Satisfaction

Parent and Guardian

To control for influence the interventions may have played in satisfaction, only pre-survey responses (n= 683) of parents were used for analysis. When asked to respond to “childhood obesity is a problem at my child’s school” 41.2% of parents disagreed, 46.9% neither agreed nor disagreed or selected I don’t know, and 11.9% agreed that childhood obesity was a problem at their child’s school.

Table 4.10 shows results from a one-way ANOVA and Tukey Post Hoc analysis which was used to compare satisfaction of parents who disagreed, were indifferent about, or agreed that childhood obesity was a problem in their child's school. The parents who neither agreed or disagreed (4.1) that childhood obesity was a local problem had significantly higher satisfaction ($P < .001$) compared to parents who disagreed (3.9) or agreed (3.7) with the childhood obesity statement. This pattern was similar, with some exceptions, for the individual satisfaction items.

This overall difference was driven by significant differences between the groups for responses to "the food in the cafeteria tastes good" ($P < .001$), "there is a variety of food choices" ($P = .002$) "the menus offer healthy choices" ($P < .001$), "the food looks appealing" ($P < .001$) "the menus has food my child likes" ($P = .008$) and "I feel good about my child eating in the cafeteria" ($P = .003$). The practical difference for each satisfaction variable as well as total satisfaction was small (eta squared range .014 to .028). Based on these findings we reject the null hypothesis.

Table 4.10 Comparison of parent/guardians' mean pre-intervention survey scores for each satisfaction question and total satisfaction based on response to "childhood obesity is a problem at my child's school"

Childhood Obesity is a Problem in my Child's School ^A					
Parents (n= 683)					
Satisfaction Questions ^B	Disagree ± S.E. (n= 234)	Neither ± S.E. (n= 297)	Agree ± S.E. (n= 134)	P-value ^C	Eta squared ^D
The food in the cafeteria is fresh.	4.1 ± 0.1	4.3 ± 0.1	4.0 ± 0.1	.069	.008
The food in the cafeteria tastes good.	3.8 ± 0.1 ^a	4.2 ± 0.1 ^b	3.4 ± 0.2 ^a	<.001*	.024
There is a variety of food choices.	3.8 ± 0.1 ^{a,b}	4.0 ± 0.1 ^a	3.6 ± 0.1 ^b	.002*	.018
The menus offer healthy choices.	4.2 ± 0.1 ^a	4.3 ± 0.1 ^a	3.8 ± 0.1 ^b	<.001*	.026
The food looks appealing.	3.7 ± 0.1 ^a	4.1 ± 0.1 ^b	3.6 ± 0.1 ^a	<.001*	.026
The menu has food my child likes.	3.6 ± 0.1 ^{a,b}	3.8 ± 0.1 ^a	3.4 ± 0.1 ^b	.008*	.014
I feel good about my child eating in the cafeteria.	4.0 ± 0.1 ^a	4.1 ± 0.1 ^a	3.7 ± 0.1 ^b	.003*	.017
Total satisfaction	3.9 ± 0.1 ^a	4.1 ± 0.1 ^b	3.7 ± 0.1 ^a	<.001*	.028

^A Childhood obesity scores were based on a 3-point Likert scale of disagree (1), neither agree nor disagree (2), and agree (3)

^B Satisfaction scores were based on a 5-point Likert scale from strongly disagree (1) to strongly agree (5).

^C Statistical significance = $P < .05$

Means with different lowercase superscripts are significantly different from each other.

^D Eta squared effect size: .01= small, .06= moderate, .14= large

Faculty

As with the parent group, only the pre-intervention survey responses of faculty were used for this analysis. When asked whether childhood obesity was a problem in their school 39.1% of faculty disagreed, 23.0% neither agreed nor disagreed, and 37.9% agreed.

Table 4.11 shows the results of a one-way ANOVA which found no significant differences in total satisfaction with the school lunch based on faculties' perception of childhood obesity ($P = .922$). There were no significant differences for any of the satisfaction variables. Based on the findings, the null hypothesis for question 5 that there will be no difference in satisfaction with school lunch based on faculties' perception of childhood obesity as a problem is accepted.

Table 4.11 Comparison of faculties' mean pre-intervention survey scores for each satisfaction question and total satisfaction based on response to "childhood obesity is a problem at my school"

Childhood Obesity is a Problem in my School ^A					
	Faculty (n=161)				
Satisfaction Questions ^B	Disagree ±S.E. (n= 63)	Neither ± S.E. (n=37)	Agree ±S.E. (n=61)	P-value ^C	Eta squared ^D
The food in the cafeteria is fresh.	4.0 ± 0.1	4.0 ± 0.1	3.9 ± 0.1	.437	.011
The food in the cafeteria tastes good.	3.7 ± 0.1	3.7 ± 0.1	3.6 ± 0.1	.930	.001
There is a variety of food choices.	3.4 ± 0.2	3.8 ± 0.2	3.6 ± 0.2	.380	.012
The menus offer healthy choices.	4.1 ± 0.1	3.8 ± 0.2	3.8 ± 0.1	.162	.023
The food looks appealing.	3.5 ± 0.1	3.7 ± 0.2	3.6 ± 0.1	.715	.004
The menu has food I likes.	3.4 ± 0.1	3.6 ± 0.2	3.7 ± 0.1	.555	.008
The quality of my lunch experience is good	3.6 ± 0.1	3.7 ± 0.2	3.8 ± 0.1	.529	.008
Total satisfaction	3.7 ± 0.1	3.7 ± 0.1	3.7 ± 0.1	.922	.001

^A Responses were rated on a 5-point Likert scale from strongly disagree (1) to strongly agree (5). Parent and faculty who responded neither were omitted from this analysis.

All responses were calculated using pre-survey scores.

^B Satisfaction scores were rated on a 5-point Likert scale from strongly disagree (1) to strongly agree (5).

^C Statistical significance = $P < .05$

^D Eta squared effect size: .01= small, .06= moderate, .14= large

Role of the School and Total Satisfaction

Parent and Guardian

When parents were asked to respond to “it is the role of the school to offer food that promotes good health”, 5.1% disagreed, 14.0% neither agreed nor disagreed, and 80.9% agreed.

Table 4.12 shows the results of a one-way ANOVA and Tukey Post Hoc. Overall, parents who agreed or were neutral (neither agreed or disagreed) that the school has a role in offering foods that promote good health had higher satisfaction with the school lunch program compared to parents who disagreed ($P < .001$). This observation was consistent across all seven satisfaction items, with one exception: “the menus offer healthy choices”. For this item, the satisfaction of parents who agreed and disagreed about the school’s role to provide health food was similar. However, the practical significance of these differences was small (eta squared range .009 to .056), apart from “the menu has food my child likes” (eta squared = .066).

Table 4.12: Comparison of parent/guardians' mean pre-intervention survey scores for each satisfaction variable and total satisfaction based on response to the statement "it is the role of the school to provide food that promotes health"

It is the Role of the School ^A					
	Parents (n= 683) ^B				
Satisfaction Scores ^C	Disagree ± S.E. (n= 47)	Neither ± S.E. (n= 105)	Agree ± S.E. (n= 527)	P-value ^D	Eta squared ^E
The food in the cafeteria is fresh.	3.5 ± 0.3 ^a	4.3 ± 0.1 ^b	4.3 ± 0.1 ^b	<.001*	.026
The food in the cafeteria tastes good.	3.1 ± 0.2 ^a	4.0 ± 0.1 ^b	4.1 ± 0.1 ^b	<.001*	.031
There is a variety of food choices.	3.0 ± 0.2 ^a	3.9 ± 0.2 ^b	3.9 ± 0.1 ^b	<.001*	.026
The menus offer healthy choices.	3.8 ± 0.2 ^a	4.3 ± 0.1 ^b	4.2 ± 0.1 ^{a,b}	.045*	.009
The food looks appealing.	3.0 ± 0.2 ^a	3.8 ± 0.2 ^b	3.6 ± 0.1 ^b	<.001*	.030
The menu has food my child likes.	2.5 ± 0.2 ^a	3.7 ± 0.1 ^b	3.8 ± 0.1 ^b	<.001*	.066
I feel good about my child eating in the cafeteria.	3.0 ± 0.2 ^a	3.9 ± 0.1 ^b	4.0 ± 0.1 ^b	<.001*	.049
Total satisfaction	3.1 ± 0.2 ^a	4.0 ± 0.1 ^b	4.0 ± 0.0 ^b	<.001*	.056

^A Role of the school scores were based on a 3-point Likert scale of disagree (1), neither agree nor disagree (2), and agree (3)

^B Four surveys were missing information on perception of the role of the school

^C Satisfaction scores were based on a 5-point Likert scale from strongly disagree (1) to strongly agree (5).

^D Statistical significance = $P < .05$

Means with different superscripts are significantly different from each other

^E Eta squared effect size: small = .01; moderate = .06; large = .14

Faculty

When faculty were asked to respond to "it is the role of the school to offer food that promotes good health," 9.0% disagreed, 12.0% neither agreed nor disagreed, and 79.0% agreed.

Table 4.13 shows the results from a one-way ANOVA which determined the change in satisfaction was not significantly related to faculties' perception of the role of the school ($P = .076$). Based on these findings, we accept the null hypothesis.

Table 4.13: Comparison of faculties' mean pre-intervention survey scores for each satisfaction variable and total satisfaction based on response to the statement "it is the role of the school to provide food that promotes health"

It is the Role of the School ^A					
	Faculty ^B (n= 160)				
Satisfaction Scores ^C	Disagree ± S.E. (n= 13)	Neither ± S.E. (n= 20)	Agree ± S.E. (n= 127)	P-value ^D	Eta squared ^E
The food in the cafeteria is fresh.	3.5 ± 0.3	4.1 ± 0.2	4.0 ± 0.1	.136	.025
The food in the cafeteria tastes good.	3.4 ± 0.2	3.5 ± 0.2	3.7 ± 0.1	.211	.020
There is a variety of food choices.	3.1 ± 0.4	3.4 ± 0.3	3.6 ± 0.1	.231	.018
The menus offer healthy choices.	3.5 ± 0.4	3.9 ± 0.1	4.0 ± 0.1	.198	.021
The food looks appealing.	3.3 ± 0.2	3.3 ± 0.2	3.7 ± 0.1	.140	.025
The menu has food my child likes.	3.1 ± 0.3	3.4 ± 0.2	3.6 ± 0.1	.209	.020
I feel good about my child eating in the cafeteria.	3.4 ± 0.2	3.4 ± 0.2	3.7 ± 0.1	.226	.019
Total satisfaction	3.2 ± 0.2	3.6 ± 0.2	3.7 ± 0.1	.076	.033

^A Role of the school scores were based on a 3-point Likert scale of disagree (1), neither agree nor disagree (2), and agree (3)

^B Two surveys were missing information on perception of the role of the school to provide food that promotes health

^C Satisfaction scores were based on a 5-point Likert scale from strongly disagree (1) to strongly agree (5).

^D Statistical significance = $P < .05$

^E Eta squared effect size: .01= small, .06= medium, .14= large

Summary of Hypotheses Decisions

Table 4.14 summarizes each research question, hypothesis, and statistical analysis used to determine whether each null hypothesis was rejected or accepted.

Table 4.14: Summary of questions, hypothesis, and statistical analysis

Question	Statistical analysis	Hypothesis	Accept or reject null hypothesis
Is there a change in students' total satisfaction with school lunch after a one-year intervention of increased communication to parents and faculty about the school lunch program?	Independent sample t-test	H ₀ : There will be no change in students' satisfaction after the one-year intervention to increase communication about the NSLP.	Elementary students: reject null hypothesis Middle and high school students: Accept null hypothesis
Is there a change in parents' total satisfaction with school lunch after a one-year intervention of increased communication about the school lunch program?	Independent sample t-test	H ₀ : There will be no change in parents' satisfaction after the one-year to increase communication about the NSLP.	Reject null hypothesis
Is there a change in faculties' total satisfaction with school lunch after a one-year intervention of increased communication about the school lunch program?	Independent sample t-test	H ₀ : There will be no change in faculties' satisfaction after the one-year intervention to increase communication about the NSLP.	Accept null hypothesis
Does parents' perception of childhood obesity being a problem at	ANOVA	H ₀ : There will be no difference in satisfaction between parents' who have	Reject null hypothesis

their child's school affect their satisfaction with school lunch?		different perceptions of childhood obesity as a problem at their child's school.	
Does faculties' perception of childhood obesity being a problem at their school affect their satisfaction with school lunch?	ANOVA	H ₀ : There will be no difference in satisfaction between faculty who have different perceptions of childhood obesity as a problem at their school.	Accept null hypothesis
Does parents' perception of the role of the school to offer food that promotes good health affect their satisfaction with school lunch?	ANOVA	H ₀ : There will be no difference in satisfaction between parents who have different perceptions of the school's role to offer food that promotes good health.	Reject null hypothesis
Does faculties' perception of the role of the school to offer food that promotes good health affect their satisfaction with school lunch?	ANOVA	H ₀ : There will be no difference between faculty who have different perceptions of the school's role to offer food that promotes good health.	Accept null hypothesis

CHAPTER V

DISCUSSION AND CONCLUSION

A previous study assessed the impact of the chef consultation provided by CFK and found no significant change in satisfaction for students but an increase in satisfaction for parents and faculty, although the differences were small (Nguyen, 2018). In addition to improving taste and appeal of school lunch, increasing social media, collecting information regarding food preferences, and increasing community engagement about the benefits of school lunch may increase satisfaction and improve the perception of the NSLP in key stakeholder groups (Nguyen, 2018 & MacLellan et al., 2010). Based on these findings, the current study was designed and conducted as a follow-up. The primary purpose of this study was to determine if a year-long intervention aimed at increasing communication about the NSLP to parents and faculty increased their satisfaction with the school lunch program. Secondary purposes of this study were to determine if parent and faculty total satisfaction in the NSLP differed based on their perception of childhood obesity or their perception of the role of the school to offer food that promotes good

health and to determine if targeting an intervention aimed at increasing parent and faculty satisfaction would also increase student satisfaction.

Overall, CNDs at participating schools reported using the communication activities provided by the researchers. The activities used most often were handouts, taste tests, faculty social media contest, and student recipe contests. CNDs reported a higher average use of activities that engaged faculty than activities that engaged parents. This could explain why faculty reported an average awareness of over twice as many activities as parents. The difference could also be due to a more direct method of communication from schools to faculty versus from schools to parents, where children were the main method of communication. Of the interventions used by the CNDs, parents and faculty were most aware of handouts and the student recipe contest. More research needs to be done to determine barriers that deterred CNDs from utilizing more parent related activities.

In this study, despite parents reporting awareness of less than one intervention activity, there was a significant increase in parent satisfaction with the school meal. It is plausible the increase was driven by an increase in parents' perception the cafeteria provided food their child liked. This is supported by a similar study in which parents reported their perception of the school cafeteria was influenced by their children (Nguyen, 2018). In addition, parents tended to agree that the school meal provided healthy choices and that they felt good about their child eating in the cafeteria. Likewise, parents who agreed that it is a role of the school to provide healthy foods reported higher satisfaction with the school meal. These findings reflect those of Ohri-Vachaspati (2014)

and Farris et al., (2016) who reported that parental satisfaction was driven by nutritional quality of the meals, variety of foods offered, and the child's taste preferences.

While previous studies have shown parent satisfaction to be a significant predictor of students' satisfaction and participation in the NSLP, other factors also drive student satisfaction (Ohri-Vachaspati, 2014). Meyer and Conklin (1998) suggested that students' satisfaction in the NSLP was the number one predictor of participation. In this study, both elementary and secondary student groups reported neutral satisfaction with school lunches. This neutral perception was most influenced by their perception that food did not look appealing. This is consistent with previous studies reporting that appeal and taste, as well as food cafeteria staff attentiveness, are significant predictors of student satisfaction and participation in the NSLP (Nguyen, 2018; Castillo & Lofton, 2012).

Another explanation for the small decline in student satisfaction over the one-year intervention was the difference in the proportion of students across grade levels for both elementary and secondary student groups and participation frequency for middle/high school students between the pre-survey and post-survey sample. Both grade level and participation frequency were correlated with total satisfaction in previous research (Meyer, 2000b; Meyer, 2005; Kjosen et al., 2015), with higher satisfaction reported from students of lower grade levels and those who participated regularly in the program. Although this could account for some of the difference, it is important to note that the post-survey sample had a higher percentage of students who participated more frequently and who were in lower grades than the pre-survey sample. Another plausible factor may be that the intervention was designed to target parents and faculty, not specifically students.

Previously successful interventions designed to increase students' satisfaction and participation in the NSLP included activities geared directly at students, such as classroom education and posters, offering fruits and vegetables more often, and involving students while making changes to the menu (Goldberg et al., 2009; Wojcicki & Heyman, 2006). This may suggest that targeting parents and faculty alone is not enough to influence students and that future interventions aimed at increasing student participation and satisfaction should include direct student involvement. These types of interventions often require the support of school faculty (Esquivel et al., 2016, Kubik et al., 2005, USDA, 2016). An encouraging finding from this study was that 3 of 4 faculty agreed that the school has a role in providing food that promotes health suggesting that they may be supportive of changes in school policy to promote health.

Faculty reported the food tasted better after the one-year intervention, which may have led to the increase in the perception of a good lunch experience and the trend toward overall increase in satisfaction. Although a large percent of faculty agreed that it was the school's role to promote health and that childhood obesity was a local problem, compared to parents, these perceptions did not significantly relate to their satisfaction with school meals. These findings may suggest that faculty members base their overall satisfaction more heavily on personal experience than parents.

There is little disagreement that improving nutrition quality of school meals can have a positive health benefit on students, including reduced risk for obesity (Cullen et al., 2015; FRAC, 2016b). Further, it is well established that childhood obesity is a national health concern (Millimet et al., 2010). However, to effectively address the issue, it is important for people who have influence in a child's life to acknowledge childhood

obesity as a problem (Towns & D'Auria, 2009; Rhee et al., 2005). In this study, three-fourths of parents and two-thirds of faculty did not agree that childhood obesity was a problem at their child's school. This finding is consistent with previous studies reporting that a low percentage of mothers are able to correctly identify their child as overweight (Baughcum et al., 2000; Hildebrand et al., in press).

A unique finding of this study was that parents who agreed that childhood obesity was a local problem had a slightly lower satisfaction with the program compared to those who did not perceive childhood obesity to be a local problem. This supports previous findings that nutritional quality is a major predictor of parent satisfaction in the NSLP. Hildebrand et al. (2018) found that parents who agreed that childhood obesity was a problem in their child's school were more likely to agree that it is the school's role to provide foods that promote health and reduce obesity. It should be noted that in this study only a small difference in satisfaction can be explained by childhood obesity perceptions. The rate of childhood obesity in Oklahoma is above the national average which may make the issue harder to recognize since a higher percentage of children struggle with obesity. These findings suggest additional need to research the relationships between parents' satisfaction with school meal programs, their perception of the school's role to promote health food, and the perception of childhood obesity as a local problem.

Strengths and Limitations

A strength of this study was collection of data using validated surveys from previous studies. While the pre- and post- samples were not matched, the demographic characteristics of parents/guardians and faculty were similar for the pre- and post- groups.

Further, the data were clustered by school using a standardized pre-satisfaction scores for each school. Use of this method reduced burden to the schools who administered the surveys.

While the eligible schools were limited to those participating in the CFK chef consult program, the participating schools did represent all grade levels, sizes and geographical diversity across the state. The instructions and materials provided to each of the different school sites were the same; however, the actual implementation of each monthly activity was left up to the school site. This opened opportunity for possible inconsistencies in implementation between locations and may have limited parents' awareness of the activities (Schletcher et al., 2016). To help address the limitation, the CND survey provided information related to the number of activities implemented and the parent and faculty survey assessed the number of activities each group remembered seeing or engaging in. An advantage of schools being directly responsible for activity implementation was the ability to determine which interventions were used most often, and those that may be acceptable to schools in future efforts. All materials, including handouts, were only provided to the school in an English version and did not take individual target audiences into consideration.

Last, an unexpected teacher strike occurred during April of the intervention year. This resulted in many schools closing for one day up to one week during that time. This event may have affected the implementation of activities and may also have affected the perception of the school or satisfaction in government sponsored activities within the school, like the NSLP.

Conclusion

Overall, the increase in communication and engagement activities increased parent satisfaction but had no significant change for faculty and secondary students' satisfaction, and had a small decrease in elementary student satisfaction. The difference in success among stakeholder groups may be due to difference in factors that influence overall satisfaction.

Similar to previous studies, parents and faculty alike largely agreed that it is the school's role to provide foods that promote health. In contrast, a small percentage of faculty, and an even smaller percentage of parents, felt that childhood obesity was a problem in the local school. This contrast in perceptions is important to note, especially for parents, because perception of childhood obesity had a significant influence on total satisfaction and parent satisfaction was a predictor of student participation in the NSLP (Ohri-Vachaspati, 2014). Further, these findings suggest additional efforts are needed to help parents and faculty recognize the problem of childhood obesity and the potential role of the school in addressing and preventing childhood obesity, which could enhance the stakeholders support of related efforts.

Implications for Future Research

Overall, a better understanding of the factors that influence satisfaction of school lunch is needed in order to design interventions that independently targets each stakeholder group. Based on the findings from this study and from previous literature, faculties' and parents' satisfaction with the NSLP are affected by different factors. Parents were more concerned with the nutritional quality of the school lunch and whether

their child liked the school meals; whereas faculty and students were more concerned with the taste and appeal of the school meals and their overall lunch experience. As such, future research is needed to determine successful methods and topics of communication between the school and different stakeholder groups regarding child nutrition and the NSLP.

Future interventions to increase student satisfaction in the NSLP should incorporate direct involvement of students. Targeting parents and faculty alone was not enough to significantly increase student satisfaction. More research should be conducted to determine the extent of influence parent and faculty satisfaction has on student satisfaction, especially when considering other descriptive variables, such as grade level. Future research to increase parent satisfaction in the NSLP should aim to increase the percentage of parents who agreed that it is the role of the school to promote health and prevent obesity. More research still needs to be conducted to better understand the influences that affect faculties' perception of the school lunch and perception of their role in influencing the health of students.

In addition to school nutrition, research should focus on methods of educating the community on the prevalence and consequences of childhood obesity and the role of the school in health promotion and obesity prevention. When the issue of childhood obesity is acknowledged, schools receive more support when making changes that promote health (Murphy & Polivka, 2016).

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APPENDICES

Appendix A

Oklahoma State University Institutional Review Board

Date Monday, October 2, 2017 Protocol Expires: 10/1/2018

IRB Application No:HE1576

Proposal Title: Cooking for Kids Consulting Chef Evaluation

Reviewed and Expedited
Processed as: **Continuation**

Status Recommended by Reviewer(s) **Approved**

Principal
Investigator(s)

:

Deana Hildebrand
315 HES
Stillwater, OK 74078

Barbara J. Brown
301 HES
Stillwater, OK 74078

Cassidy Ring
319 Scott Hall
Stillwater, OK
74078

Approvals are valid until the expiration date, after which time a request for continuation must be submitted. Any modifications to the research project approved by the IRB must be submitted for approval with the advisor's signature. The IRB office **MUST** be notified in writing when a project is complete. Approved projects are subject to monitoring by the

IRB. Expedited and exempt projects may be reviewed by the full Institutional Review Board.

■ The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

The reviewer(s) had these comments:

New subject enrollment still in progress. No new changes. No changes in risks/benefits. No reportable events, withdrawals, or complaints. Continued funding from Oklahoma State Department of Education

Signature:



Hugh Crethar, Chair, Institutional Review Board

Monday, October 2, 2017
Date

Appendix B



Elementary School Pre-School Food Satisfaction Survey

Name of School District: _____ Date: _____

Circle the smiley face that shows how you feel when you eat school lunch.

The food tastes good?



Yes



Maybe



No

The cafeteria has food I like?



Yes



Maybe



No

The food looks good



Yes



Maybe



No

The cafeteria is fun place to be?



Yes



Maybe



No

Check the boxes below that describe you:

I am in 3rd grade; 4th grade; 5th grade

Appendix C



Elementary School Post-School Food Satisfaction Survey

Name of School District: _____ Date: _____

Circle the smiley face that shows how you feel when you eat school lunch.

The food tastes good?



Yes



Maybe



No

The cafeteria has food I like?



Yes



Maybe



No

The food looks good



Yes



Maybe



No

The cafeteria is fun place to be?



Yes



Maybe



No

Check the boxes below that describe you:

I am in 3rd grade; 4th grade; 5th grade

Appendix D



Middle School and High School

Pre-School Food Satisfaction Survey

School: _____ Date: _____

Please take a few minutes to offer feedback on the quality of your lunch experience at the school cafeteria.

Instructions:

Listed below are several characteristics of school lunch programs. As you answer, use the phrase, "When I eat school lunch..." before each statement, and then rate your level of agreement by using the scale 1 (Strongly Disagree) to 5 (Strongly Agree).

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
The food is fresh.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The food tastes good.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is a variety of food choices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The menus offers healthy choices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The food looks appealing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The menu has food I like.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I get to socialize with my friends.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

On average, how many times per week do you eat school lunch?

- Never
 1-2 Days
 3-4 Days
 Everyday

What is your grade in school?

- 5th Grade
 6th Grade
 7th Grade
 8th Grade
 9th Grade
 10th Grade
 11th Grade
 12th Grade

Additional Comments:

Appendix E



Middle School and High School Post-School Food Satisfaction Survey

School: _____ Date: _____

Please take a few minutes to offer feedback on the quality of your lunch experience at the school cafeteria.

Instructions:

Listed below are several characteristics of school lunch programs. As you answer, use the phrase, "When I eat school lunch..." before each statement, and then rate your level of agreement by using the scale 1 (Strongly Disagree) to 5 (Strongly Agree).

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
The food is fresh.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The food tastes good.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is a variety of food choices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The menu offers healthy choices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The food looks appealing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The menu has food I like.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I get to socialize with my friends.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

On average, how many times per week do you eat school lunch?

- Never
 1-2 Days
 3-4 Days
 Everyday

What is your grade in school?

- 5th Grade
 6th Grade
 7th Grade
 8th Grade
 9th Grade
 10th Grade
 11th Grade
 12th Grade

Additional Comments:

Appendix F



Parent/Guardian

Pre-School Food Satisfaction Survey

School: _____ Date: _____

Instructions:

Please answer the questions below about your child's school lunch program. Rate your level of agreement by using the scale 1 (Strongly Disagree) to 5 (Strongly Agree). If you have more than one child in the above school please provide answers about the youngest child.

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree	I Don't Know
The food in the cafeteria is fresh.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The food in the cafeteria tastes good.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is a variety of food choices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The menus offer healthy choices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The food looks appealing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The menu has food my child likes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel good about my child eating in the cafeteria.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please rate your level of agreement by using the scale 1 (Strongly Disagree) to 5 (Strongly Agree).

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree	I Don't Know
Childhood obesity is a problem in my child's school.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is the role of the school to offer food that promotes good health.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

On average, how many times per week does your child eat school lunch?

- Never
 1-2 Days
 3-4 Days
 Everyday

What is your child's grade level?

- Elementary School
 Middle School
 Junior High School
 High School

How often do you eat with your child in the school cafeteria?

- I have not eaten in the school cafeteria. Often (1-2 times a month)
 Sometimes (2-3 times a semester) Infrequently (once a year)

What is the highest level of education you've completed?

- Less than high school High school graduate of GED
 Associates degree or vocational/technical school Some college
 Bachelor's degree Master's degree or higher

Comments

Appendix G



Parent/Guardian

Post-School Food Satisfaction Survey

School: _____ Date: _____

Instructions:

Please answer the questions below about your child's school lunch program. Rate your level of agreement by using the scale 1 (Strongly Disagree) to 5 (Strongly Agree). If you have more than one child in the above school please provide answers about the youngest child.

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree	I Don't Know
The food in the cafeteria is fresh.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The food in the cafeteria tastes good.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is a variety of food choices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The menus offer healthy choices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The food looks appealing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The menu has food my child likes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel good about my child eating in the cafeteria.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please rate your level of agreement by using the scale 1 (Strongly Disagree) to 5 (Strongly Agree).

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree	I Don't Know
Childhood obesity is a problem in my child's school.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is the role of the school to offer food that promotes good health.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Were you aware that a chef was working with your school lunch program over the past school year?

Yes No

If yes, how did you hear about the chef?

Did you see or hear about any of the following related to national school lunch program?

- | | | |
|-------------------------------------|---|---|
| <input type="radio"/> Handouts | <input type="radio"/> Recipe Contests | <input type="radio"/> Social Media Contests |
| <input type="radio"/> Celebrity Day | <input type="radio"/> School Lunch Hero Day | <input type="radio"/> Other |
| <input type="radio"/> None | | |

On average, how many times per week does your child eat school lunch?

- Never 1-2 Days 3-4 Days Everyday

What is your child's grade level?

- Elementary School Middle School Junior High School High School

How often do you eat with your child in the school cafeteria?

- I have not eaten in the school cafeteria. Often (1-2 times a month)
 Sometimes (2-3 times a semester) Infrequently (once a year)

What is the highest level of education you've completed?

- | | |
|--|---|
| <input type="radio"/> Less than high school | <input type="radio"/> High school graduate of GED |
| <input type="radio"/> Associates degree or vocational/technical school | <input type="radio"/> Some college |
| <input type="radio"/> Bachelor's degree | <input type="radio"/> Master's degree or higher |

Comments

Appendix H



Administrative and Teaching Staff

Pre-School Food Satisfaction Survey

School: _____ Date: _____

Please take a few minutes to offer feedback on the quality of your lunch experience at the school cafeteria.

Instructions:

Listed below are several characteristics of school lunch programs. As you answer, use the phrase, "When I eat school lunch..." before each statement, and then rate your level of agreement by using the scale 1 (Strongly Disagree) to 5 (Strongly Agree).

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
The food is fresh.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The food tastes good.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is a variety of food choices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The menus offers healthy choices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The food looks appealing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The menu has food I like.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The quality of my lunch experience is good.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please rate your level of agreement by using the scale 1 (Strongly Disagree) to 5 (Strongly Agree).

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
Childhood obesity is a problem in my school.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is the role of the school to offer food that promotes good health.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

On average, how many times per week do you eat school lunch?

- Never
 1-2 Days
 3-4 Days
 Everyday

Additional Comments:

Appendix I



Administrative and Teaching Staff

Post-School Food Satisfaction Survey

School: _____ Date: _____

Please take a few minutes to offer feedback on the quality of your lunch experience at the school cafeteria.

Instructions:

Listed below are several characteristics of school lunch programs. As you answer, use the phrase, "When I eat school lunch..." before each statement, and then rate your level of agreement by using the scale 1 (Strongly Disagree) to 5 (Strongly Agree).

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
The food is fresh.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The food tastes good.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is a variety of food choices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The menu offers healthy choices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The food looks appealing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The menu has food I like.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The quality of my lunch experience is good.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please rate your level of agreement by using the scale 1 (Strongly Disagree) to 5 (Strongly Agree).

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
Childhood obesity is a problem in my school.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is the role of the school to offer food that promotes good health.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Were you aware that a chef was working with your school lunch program over the past school year?

Yes No

If yes, how did you hear about the chef?

Did you see or hear about any of the following related to national school lunch program?

- Handouts Celebrity Day Recipe Contests
 Social Media Contests School Lunch Hero Day Other
 None

On average, how many times per week do you eat school lunch?

- Never 1-2 Days 3-4 Days Everyday

Additional Comments:

Appendix J

Press Release

Local school nutrition professionals earn a chance to work with trained chef

STILLWATER, Okla. – *(Name of school district)* school nutrition professionals will team up with a trained chef this semester to cook up fresher, tastier cafeteria offerings and whip up a sweeter overall dining experience.

Through Cooking for Kids, an innovative culinary training program designed to change the school nutrition landscape across Oklahoma, consulting chefs will partner with the district to identify key needs and develop an action plan tailored to meet those needs.

Consulting chefs will focus specifically on menu development and procurement, equipment and work schedules as well as effective marketing strategies.

"This is a great opportunity for our school district to work with a trained chef to enhance not only the meals we serve, but also the services we provide to our students," said *(First and last name)*, *(Title)*.

The district earned a chance to apply for a chef consultation after nutrition professionals from schools throughout the district participated in regional training sessions offered this summer through the Cooking for Kids program.

During those regional training sessions, school nutrition professionals learned creative, new ways to prepare healthy, balanced, flavorful meals. They also began working with revamped menus featuring more scratch cooking.

"There's no doubt school nutrition professionals are as committed as anyone to our students," said Deana Hildebrand, Oklahoma State University Cooperative Extension nutrition specialist and lead coordinator for Cooking for Kids. "These school districts are proving how serious they are about that commitment by taking advantage of the chance to partner with a chef to enhance their school meal program."

The Cooking for Kids culinary training program is a partnership between the College of Human Sciences at Oklahoma State University and the Oklahoma State Department of Education funded by a grant from the U.S. Department of Agriculture.

The initiative is designed to increase the availability of freshly prepared foods, boost student participation in the school meal program and expand public support for child nutrition programs.

Cooking for Kids was developed to help schools in Oklahoma implement revised nutritional standards established by the 2010 Healthy and Hunger Free Kids Act. Participation in the program is free and open to all schools in the state. For more information, visit www.CookingforKids.ok.gov.

Appendix K



COOKING for KIDS

Your school is partnering with **COOKING for KIDS!**


This school year your school's child nutrition program is working with a chef to revamp menus and create a healthy lunchroom environment.

School Meals Matter^{2,3}

- Students who participate in school meal programs consume more milk, fruits, and vegetables and have better intake of important nutrients.
- Research shows that proper nutrition:
 - ✓ helps kids concentrate better in class.
 - ✓ strengthens academic performance.
 - ✓ reduces behavioral problems.
- School meals offer students the nutrients they need everyday.
 - ✓ A variety of fruits and vegetables
 - ✓ Whole grain-rich foods
 - ✓ Low-fat milk or fat-free milk varieties
 - ✓ Lean protein and "right-sized" portions

²United States Department of Agriculture. Child Nutrition Programs. Economic Research Service Briefing Rooms. 2010
³Center for Disease Control and Prevention. (2017, May 26). School Meals. Retrieved from <https://www.cdc.gov/healthy-schools/npsa/schoolmeals.htm>

You can support a healthy school food environment¹

-  Try new foods at home. Kids need many opportunities to taste a new food to "get used to it."
-  Eat lunch at school with your child. Learn more about what's offered and meet school nutrition staff.
-  Talk with your child about what is on the menu each day.
-  Be sure your child takes a food from each food group.

¹United States Department of Agriculture. (2017, June 21). Healthier School Day. Retrieved from <https://www.fns.usda.gov/school-meals/healthierschoolday>

 twitter.com/cooking4kidsok

 facebook.com/cookingforkidsok

COOKINGforKIDS.ok.gov

Appendix L



COOKING for KIDS




Your school is partnering with **COOKING for KIDS!**

This school year your school's child nutrition program is working with a chef to revamp menus and create a healthy lunchroom environment.

School Meals Matter^{1,2}

Students who participate in school meal programs consume more milk, fruits, and vegetables and have better intake of important nutrients.

Research shows that proper nutrition:

-  helps kids concentrate better in class.
-  strengthens academic performance.
-  reduces behavioral problems.

¹United States Department of Agriculture. Child Nutrition Programs. Economic Research Service. Briefing Room. 2010.
²United States Department of Agriculture. (2013, November). Healthier School Meals: Every Teacher Can Help. Retrieved from <https://nrc-prod.arsusda.gov/sites/default/files/HMS4Teachers.pdf>

You can support a healthy school food environment^{3,4}

- Speak positively about school meals and encourage your students to taste new foods.
- Be a role model. Consume healthy foods and beverages and eat meals in the cafeteria.
- Allow students to drink water during class.
- Use nonfood rewards in the classroom such as stickers, books or walks with the principal or teacher.
- Utilize fundraisers that feature non-food items or foods and beverages that meet Smart Snack standards.
- Give parents a list of healthy foods and beverages that can be served at celebrations.
- Join your school wellness committee.

³Center for Disease Control and Prevention. (2017, September 5). Tips for Teachers. Retrieved from Healthy Schools: <https://www.cdc.gov/healthyschools/npss/teachers.htm>
⁴United States Department of Agriculture. (n.d.). Tips for Educators on Supporting Healthy School Meals. Retrieved from <https://nrc-prod.arsusda.gov/sites/default/files/HMS-educators.pdf>



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Appendix M



November

Your staff has learned about the importance and how to conduct a taste tests at skill development and culinary management training. Now it is time to put that knowledge into practice.

- Page 18 you will find the Honey Lemon Carrot recipe that you and your staff made during training. Use this recipe to conduct your very own taste testing.
- Send the family version of the recipe (page 19) home with the students. If they like it at school, hopefully they will encourage their family to make it at home.
- You can also post this link to a short video demonstrating the recipe being made to your social media accounts and send out in your newsletter.

[Honey Lemon Carrot Video](#)

- Don't forget to get the student's feedback but using the taste preference sheets on pages 20 and 21.

If the link does not work, the video can also be found at <https://cookingforkids.ok.gov/family-resources>



COOKING for KIDS

HONEY LEMON CARROTS

MAKES 4 SERVINGS

Ingredients:

- 1 pound of baby carrots
- 1 ¼ oz. of margarine
- 1 ½ tablespoons of honey
- 1 ½ tablespoons of lemon
- A sprinkle of ginger



Directions:

1. Preheat oven to 350 °F
2. Mix ingredients in a bowl
3. Spread carrots on a parchment lined tray and roast in over for 45 minutes.



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COOKINGforKIDS.ok.gov

COOKING for KIDS

HONEY LEMON CARROTS

MAKES 4 SERVINGS

Ingredients:

- 1 pound of baby carrots
- 1 ¼ oz. of margarine
- 1 ½ tablespoons of honey
- 1 ½ tablespoons of lemon
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Directions:

1. Preheat oven to 350 °F
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Appendix N



United States Department of Agriculture

Welcome to School Lunch!

Eating with friends and trying new foods can be fun.
There are many choices from each of the five food groups.

Draw a line from each lunch food to the correct food group friend.
(Answers on back.)

The matching exercise consists of five food groups, each with a cartoon character and a list of food items:

- Farrah Fruit:** A red, round character with a basket of fruit. Food items: Low-fat Yogurt, Orange, and a slice of orange.
- Reggie Veggie:** A green, carrot-like character with a leafy top. Food items: Banana, Broccoli, and a slice of bread.
- Mary Dairy:** A purple and blue character with a milk can. Food items: Chicken Drumstick, Broccoli, and a carton of Fat-Free Milk.
- Jane Grain:** A yellow, wheat-like character with a straw hat. Food items: Chocolate Chip Cookie, Purple Grapes, and Green Beans.
- Dean Protein:** A brown, dog-like character with a pink hat. Food items: Tomato, Noodles, and a slice of bread.

A dotted line connects a tomato to the 'Farrah Fruit' character.



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<http://teamnutrition.usda.gov>

Parents







School meals now have more fruits, vegetables, and whole grains. They are also healthier with less saturated and *trans* fats and sodium. Join your child for lunch one day and see the changes.

A Color Adventure!

It's fun to find new favorite foods. Choose a new fruit or vegetable of each color to try. Then, hold a family taste test. Write how your family felt about the new food below.

Draw a picture of the new fruit or vegetable in each box.



<p>Red Fruit/Vegetable</p> <p>How We Felt About the Food</p> 	<p>Orange Fruit/Vegetable</p> <p>How We Felt About the Food</p> 
<p>Yellow Fruit/Vegetable</p> <p>How We Felt About the Food</p> 	<p>Green Fruit/Vegetable</p> <p>How We Felt About the Food</p> 
<p>Blue Fruit/Vegetable</p> <p>How We Felt About the Food</p> 	<p>Purple Fruit/Vegetable</p> <p>How We Felt About the Food</p> 

You Did It! Celebrate with a trip to the park or playground.

Parents

Got colors? Try red beans, orange cantaloupe, yellow squash, green kale, blueberries, or purple cabbage. Check the school lunch menu for other ideas.

Answers: FRUITS: orange, banana, grapes, strawberries. VEGETABLES: tomato, broccoli, green beans, yellow squash. GRAINS: bread, pasta. DAIRY: yogurt, milk. PROTEIN FOODS: tuna fish, chicken leg, hamburger. To learn more about the food groups, visit <http://www.choosemyplate.gov>.

Appendix O

COOKING for KIDS

Snap, Post, & Win!

Get creative in the kitchen with your kids this holiday season and win an Instant Pot and Best Bites cookbook!


Step 1: Snap and post a picture of your favorite HEALTHY holiday dish to Facebook or Twitter.

Step 2: Add the hashtag #cookingforkidsok, describe the dish in the caption, and tag your school.

To be eligible you must be a parent, student, staff or faculty member of a school that is participating in a **COOKING for KIDS** chef consultation.

Contest runs now through 1/1/18. Two winners will be chosen at random and announced on 1/8/18.



 twitter.com/cooking4kidsok

 facebook.com/cookingforkidsok

For recipe ideas visit:
COOKINGforKIDS.ok.gov

Appendix P

CELEBRITY Day

This month hold a celebrity day in your cafeteria. Select a day to invite local celebrities to join your students for breakfast or lunch. A few examples of local celebrities include:

- mascots from sports teams
- members from a university sports team
- news reporters
- a familiar local face
- the mayor
- city councilperson
- fireman
- policeman

Seek out people who are familiar to the children and bring about a positive image. Students listen not only to their peers, but to adults that they emulate.

Post your photos on social media with the hashtag **#cookingforkidsok** so we can celebrate your successful day!

twitter.com/cooking4kidsok

facebook.com/cookingforkidsok

COOKINGforKIDS.ok.gov

Appendix Q



Share the LOVE

COOKING for KIDS

Show us your love for school lunch. Share a picture of your favorite school meal and enter a chance to win a YETI water bottle!

Step 1: Like the Cooking for Kids Facebook page.

Step 2: Dine in your school cafeteria and snap a picture of your favorite school breakfast or lunch.

Step 3: Post your photo to the Cooking for Kids Facebook page, describe the dish in the caption, and tag your school. You may enter multiple times.

To be eligible you must be a staff or faculty member of a school that is participating in a **COOKING for KIDS** chef consultation.

Contest runs now through 2/28/18. For every school meal you share with us, receive one entry to the prize drawing. One prize will be rewarded per school.

For recipe ideas visit:
COOKINGforKIDS.ok.gov

 facebook.com/cookingforkidsok

Appendix R



February

It's time to hold another taste testing. This is a good way to ease your students into new recipes instead of immediately putting in on the menu which could be costly and wasteful if they don't instantly accept it.

- Page 29 you will find the Roasted Red Potatoes recipe that you and your staff made during training. Use this recipe to conduct your very own taste testing.
- Send the family version of the recipe (page 30) home with the students. If they like it at school, hopefully they will encourage their family to make it at home.
- You can also post this link to a short video demonstrating the recipe being made to your social media accounts and send out in your newsletter.

Roasted Red Potatoes

- Don't forget to get the student's feedback but using the taste preference sheets on pages 31 and 32.

If the link does not work, the video can also be found at <https://cookingforkids.ok.gov/family-resources>

Share the Love

This is also a great time for another social media contest. This contest will be for teachers and staff only. It is important that our teachers and staff are supportive of the cafeteria as well. Again, participation is easy. All they need to do is post their favorite school meal on Facebook or Twitter and they are entered to win. This will encourage them to eat school meals and model healthy behaviors for the students. You will also be receiving free marketing for your program. When they share a photo, all of their friends will see the fantastic food you are serving. Share the flier on page 33 to encourage participation.

If you are participating in a chef consultation, the COOKING for KIDS office will provide the prizes. If you are doing this activity independently, we know that your school might not be able to afford prizes. Suggestions for no cost prizes could include a special parking place, public recognition, or admin cover class for a period.

COOKING for KIDS

ROASTED RED POTATOES MAKES 4 SERVINGS

Ingredients:

- 4 cups of raw red potatoes
- 1 teaspoon of canola or olive oil
- $\frac{1}{4}$ teaspoon of fresh or $\frac{1}{8}$ teaspoon dried rosemary
- $\frac{1}{2}$ teaspoon of kosher salt
- $\frac{1}{4}$ teaspoon black pepper

Directions:

1. Preheat oven to 425°F
2. Wash and cut the red potatoes*
3. Toss the cut pieces with the oil and seasonings
4. Place seasoned potatoes on a baking pan**
5. Bake for about 40 minutes, flip half way through

*Be sure the potatoes are cut to about the same size so that they cook evenly in the oven

**Place potatoes face down on the pan for crispier edges and make sure no 2 pieces are touching



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COOKING for KIDS

ROASTED RED POTATOES MAKES 4 SERVINGS

Ingredients:

- 4 cups of raw red potatoes
- 1 teaspoon of canola or olive oil
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Directions:

1. Preheat oven to 425°F
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4. Place seasoned potatoes on a baking pan**
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*Be sure the potatoes are cut to about the same size so that they cook evenly in the oven

**Place potatoes face down on the pan for crispier edges and make sure no 2 pieces are touching



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Appendix S

COOKING for KIDS

KALE SALAD MAKES 4 SERVINGS

Ingredients:

- 1/2 lb kale, chopped
- 1 c. dried cranberries
- 1/4 c. orange juice
- 2 t. vegetable oil
- 1/4 t. kosher salt

Directions:

1. Place kale in a large mixing bowl and add juice and salt.
2. Using clean hands, massage kale until it loses some volume and turns bright green.
3. Stir in oil and dried fruit. Mix well.
4. Cover salad with plastic wrap and refrigerate 30 minutes to several hours before serving to allow flavors to develop.



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COOKING for KIDS

APPLE VINAIGRETTE MAKES 4 SERVINGS

Ingredients:

- 1/2 medium red apple, cored
- 2 T. apple cider vinegar
- 2 T. orange juice
- 1 T. honey
- 1-1/2 t. Dijon mustard
- 1/4 c. vegetable oil
- 1 dash salt

Directions:

1. Core apple and cut into smaller pieces.
2. Place all ingredients into blender and pulse until smooth.



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COOKINGforKIDS.ok.gov

Appendix T



April

This month's activity is a junior recipe contest. It does take a little more planning, but really is a lot of fun and a great way to get the kids and community involved. If you chose to participate, your consulting chef will be there to help. Think of this as the grand finale. Here are all of the documents you need to conduct the contest.

- Planning Guide (pg. 41-42)- This guide will describe step by step actions needed to prepare for the event.
- Save the Date Flier (pg. 43)
- Judge Invite (pg. 44)
- Entry Form (pg. 45-46)
- Congratulations Letter (pg. 47)
- Recipe Signage for Presentation (pg. 48)
- Participant Certificate (pg. 49)



Kids COOKING for KIDS Recipe Contest

Entering is Easy!

1. Find your favorite healthy recipe.
 - a. This recipe can be your original creation or can come from any source including a family member, online, or a cookbook.
 - b. It should be easy to prepare within 1 hour.
2. Complete the entry form on the back of this flyer.
3. Return this entry form to the cafeteria by _____. A selection of 8 finalist will be announced soon afterwards.



Judging

Date:

Location:

Students will prepare their recipe and they will be presented to a distinguished panel of judges. Food ingredients, aprons, hats, and kitchen equipment will be provided. Parents are welcome to this event!

Winners

The winning recipe will be featured on the school lunch menu. The winner will also receive a gift basket. All participants will receive a certificate.

Appendix U

CND Community Engagement Survey

Start of Block: Default Question Block

Q7



Q6 Thank you for participating in the Cooking for Kids Chef Consulting program this school year. To help us assess the effectiveness of the community engagement activities, please complete the following questions. It should take about 5 minutes of your time. Your input is greatly appreciated and useful for ongoing program improvement. Your responses will remain confidential.

Q5 Name of school district:

▼ Banner (1) ... Webbers Falls (12)

Q8 Which of the following community engagement activities did you utilize during the 2017-2018 school year?

- Parent Handout (October) (1)
 - Teacher and Staff Handout (October) (3)
 - Celebrity Day (4)
 - Social Media Recipe Videos (5)
-

- Teacher and Staff Social Media Contest (February) (6)
- Student Recipe Contest (7)
- Social Media Contests (8)
- Taste Testing (9)
- MyPlate Handout (December) (10)
- Family Social Media Contest (December) (11)
- Other (12) _____

Q9 What goals do you feel you achieved as a result of the chef consultation?

Q10 Please rate your level of agreement with the following statements.

	Strongly Disagree (1)	Disagree (2)	Neither (3)	Agree (4)	Strongly Agree (5)	I Don't Know (6)
Childhood obesity is a problem in my school. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is the role of the school to offer food that promotes good health. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q9 Is there anything else you would like to share regarding your experience in the Cooking for Kids Chef Consultation?

Q11 Thank you for your time in responding!

End of Block: Default Question Block

Appendix V

Appendix V: Middle and high school students' mean pre-intervention survey scores for each satisfaction question and total satisfaction based on school lunch participation

	Never (n= 105)	1-2 Days per Week (n= 93)	3-4 Days per Week (n= 105)	Every day (n= 235)	P-value	Eta- squared
The food is fresh	3.0 ± .97 ^a	3.3 ± 1.1 ^a	3.3 ± 1.0	3.6 ± 1.0 ^b	< .001*	.059
The food tastes good	2.8 ± 1.1 ^{a,c}	3.1 ± 1.2 ^c	3.3 ± 1.1 ^{b,c}	3.7 ± 1.0 ^b	< .001*	.102
There is a variety of food choices	3.1 ± 1.1 ^a	3.4 ± 1.2	3.4 ± 1.2	3.6 ± 1.1 ^b	.009*	.022
The menus offer healthy choices	3.3 ± 1.0 ^a	3.6 ± 1.0 ^b	3.8 ± 1.1 ^b	3.9 ± .92 ^b	< .001*	.053
The food looks appealing	2.7 ± 1.1 ^a	2.6 ± 1.3 ^a	3.1 ± 1.1	3.3 ± 1.2 ^b	< .001*	.064
The menu has food I like	2.9 ± 1.1 ^{a,c}	3.1 ± 1.3 ^c	3.4 ± 1.1 ^{b,c}	3.6 ± 1.2 ^b	< .001*	.056
I get to socialize with my friends	4.0 ± 1.0 ^a	4.3 ± 1.2	4.3 ± .94	4.3 ± 1.0 ^b	.027*	.017
Total satisfaction	3.1 ± .75 ^{a,c}	3.3 ± .88 ^c	3.5 ± .75 ^{b,c}	3.7 ± .72 ^b	< .001*	.096

* Statistical significance = $P < .05$

^BFour surveys were missing information on perception of the role of the school

^CSatisfaction scores were based on a 5-point Likert scale from strongly disagree (1) to strongly agree (5).

^DEta squared effect size: small = .01; moderate = .06; large = .14

^{a,b}P-values with different superscripts are significantly different from each other

VITA

Haley Billings

Candidate for the Degree of

Master of Science

Thesis: EFFECTS OF INCREASED COMMUNICATION ABOUT CHILD NUTRITION ON STUDENTS', PARENTS' AND FACULTYS' SATISFACTION WITH SCHOOL LUNCH

Major Field: Nutritional Sciences

Biographical:

Education:

Completed the requirements for the Master of Science in Nutritional Sciences at Oklahoma State University, Stillwater, Oklahoma in May 2019.

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Experience:

Research assistant for Cooking for Kids

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Professional Memberships:

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