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School Food Environment the Frontline for Childhood Obesity Prevention - A Mixed-Methods
Study of Nutritional Competencies and Skills of School Nutrition Professionals in Nebraska

By

Zainab Rida

A DISSERTATION

Presented to the Faculty of

The Graduate College at the University of Nebraska

In Partial Fulfillment of Requirements

For the Degree of Doctor of Philosophy

Major: Human Sciences

Under the Supervision of Professor Wanda Koszewski

Lincoln, Nebraska

December, 2012

School Food Environment the Frontline for Childhood Obesity Prevention - A Mixed-Methods
Study of Nutritional Competencies and Skills of School Nutrition Professionals in Nebraska

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University of Nebraska, 2012

Advisor: Wanda Koszewski

The purpose of this statewide study was to address the nutrition knowledge, attitudes, and perceptions of school foodservice personnel in Nebraska regarding offering/serving healthy school meals. Moreover, this study identified some potential barriers and avenues of action for decreasing likelihood of preventable diseases such as childhood obesity, cardiovascular diseases, hypertension, high blood cholesterol and type II diabetes in general and offering/serving healthy school meals specifically.

A convergent parallel mixed methods design was used in which qualitative and quantitative data were collected in parallel, analyzed separately, and then merged. Data collected from the first phase (quantitative) and third phase (qualitative) support the finding in the second phase (quantitative). SFP shared many promising action plans toward making healthy school meals.

Data obtained from this study indicates that there is a strong correlation ($r = .103, p < .05$) between foodservice personnel attitudes and offering healthy school meals. Although SFP had a positive attitude toward offering/serving healthy school meals, they still voiced their concerns regarding teachers, students and their parents' attitudes toward offering/serving healthy school meals through the third phase of the study.

Data from this study suggested that there is a strong correlation ($r .237, p < .01$) between the foodservice staff's self-efficacy and their practices of offering/serving healthy school meals. Fortunately, the relationship between foodservice staff practices of offering/serving healthy school meals and their self-efficacy was positive and significantly predicted practices scores, $\beta = .237, P < 0.01$.

The finding of the present study also identifies many barriers including lack of time and support that face the foodservice personnel in offering/serving healthy school meals. The findings suggested that there is an urgent need of a full school approach to promote and encourage healthy eating habits among students. Future research is needed to evaluate school wellness policies regarding healthy eating practices in schools. Moreover, establish partnerships with communities and universities for intervention that target students and their parents.

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Table of Contents

List of Tables	viii
List of figures	ix
List of Appendices	x
Abbreviations	xi
 Chapter I: Introduction	
The Statement of Need.....	1
Purpose of this study	4
Research Questions	4
 Chapter II: Literature Review	
Socio-ecological Model and Childhood Obesity	6
Childhood Obesity and Family’s Impacts.....	7
Childhood Obesity and School’s Impacts	9
Childhood Obesity and Community’s Impacts	11
Childhood Obesity and Policy’s Impacts	13
Nutrient Intake Behavior of Nebraska Youth	15
National School Lunch Program	17
School Breakfast Program	18
After School Snack Program	19

Fresh Fruits and Vegetables Program	19
Summer Food Service Program	20
Commodity Food Program	20
2012 New Meal Pattern	21
Health Believe Model	24
Definition of key Terms	25

Chapter III: Methodology

Study Design.....	26
Research Questions	27
Philosophical Foundations of Convergent Parallel Mixed Methods	28
Significance of the Study.....	29
Ethical Considerations	30
Phase I: Online Survey	31
Participants and Data Collection Procedure	31
Validity Procedure	31
Instrument	31
Phase II: Paper Survey	32
Participants	32
Validity Procedure	33
Data Collection Procedure	33
Instrument	33
Phase III: Interviews	34
Participants	34
Data Collection Procedure	34
Instrument	35

Data Analysis	36
Quantitative Analysis	36
Qualitative Analysis	37
Qualitative Validity Procedure	37
Chapter IV: Result	
Phase I: Online Survey	38
Phase II: Paper Survey	56
Phase III: Interviews	69
Mixed Method Result	80
Chapter V: Discussion, Limitations and Conclusion	
Discussion	82
Limitations	90
Implications for Further Research	91
Conclusion	93
References.....	96
Appendices.....	103

List of Tables

1. Nutrition standards in the NSLP and its implementation and timeline for final rule	22
2. Nutrition standards in the SBP and its implementation and timeline for final rule	23
3. Reliability of the phase II instrument	36
4. Distribution of the participants based on their educational level	39
5. Frequencies regarding participants ‘attitude toward adding healthy food choices toward school menus and a la carte items.....	41
6. Distribution of the participants that selected barriers which prevent them from purchasing and preparing foods that are lower in fat and sodium	44
7. Frequencies of the respondents based on the selected strategies	47
8. Participants’ responses regarding their practices in school menus and a la carte items.	49
9. School foodservice director’s comments regarding serving/offering healthy school meals	50
10. Distribution of time spend on a daily basis.....	59
11. Frequencies of the respondents on each statement	61
12. Participants practices toward serving/offering healthy meals	63
13. Participants self-efficacy level regarding serving/offering healthy meals	64
14. Distribution of the correct knowledge respondents based on the participants occupation	66
15. Coefficients of the occupations based on self-efficacy, attitudes and knowledge	67
16. Correlations between knowledge, practices, self-efficacy and attitude	68
17. Result from merging data from phase I and II with phase III	81

List of Figures

Figure 1 Distributions of the study participants based on their level of work experience in school foodservice area.	39
Figure 2 Personnel that are in charge of school vending machines.....	50
Figure 3 Participants based on their interest level on each listed nutritional topics.....	54
Figure 4 Frequency of preferred nutrition education delivery methods	55
Figure 5 Distribution of the participants based on their occupation.	57

List of Appendices

Appendix A. IRB Letter of Approval (Survey)	103
Appendix B. School Food Service Manager Training Survey	106
Appendix C. Part II Survey	112
Appendix D. Focus Group Questions	116
Appendix E. NDE Letter of Approval	117
Appendix F. Recruitment Email to Participate in a Survey	119
Appendix G. Reminder Email to Participate in a Survey	121
Appendix H. Consent Survey Form	123
Appendix I. Consent Focus Group Form	126
Appendix J. Recruitment Phone Script for Focus Group	129
Appendix K. IRB Letter of Approval (Focus Group)	131

Abbreviations

ASSP: After School Snack Program

BMI: Body Mass Index

CACFP: Child and Adult Care Food Program

CATCH: Child and Adolescent Trail for Cardiovascular Health

CDC: Center for Disease Control and Prevention

CIM: Children's Independent Mobility

FFVP: Fresh Fruits and Vegetables Program

FNS: Food and Nutrition Services

FRAC: The Food Research and Action Center

HBM: Health Believe Model

HACCP: Hazard Analysis Critical Control Point

HHFK: Healthy Hunger-Free Kids Act

IOM: Institute of Medicine

IRB: Institutional Review Board

Kcal: Kilocalories

NDE: Nebraska Department of Education

NE SNA: Nebraska School Nutrition Association

NSLP: National School Lunch Program

Oz eq.: Ounce equivalence

PE: Physical Education

RDA: Recommended Daily Allowances

SBP: School Breakfast Program

SFP: School Foodservice Personnel

SFSP: Summer Food Service Program

SPSS: Statistical Package for Social Sciences

USDA: United States Department of Agriculture

WIC: Women, Infant and Children Program

CHAPTER I

INTRODUCTION

The Statement of Needs:

The prevalence of U.S children who are overweight or obese has increased two to three times over the last twenty years. A report from the Center for Disease Control indicates that the percentage of children aged six to eleven years who were obese increased from seven percent in 1980 to twenty percent in 2008 (Centers for Disease Control and Prevention, 2011) . According to the 2010-2011 Youth BMI Surveillance Project Report, approximately one in five Nebraska students in grades first, fourth, seventh and tenth were obese during the 2010-2011 academic school year. Additionally, more than one in six students in the grades mentioned prior was considered overweight (Nebraska Department of Health and Human Services, 2010). A study suggests that overweight and obese children are more likely to become overweight and obese adults (Daniels, Arnett, Eckel, Gidding, Haynan, jumanyika, Robison, Scott, Joer, & Williams, 2005). Being overweight and obese increases the risk of cardiovascular disease, type II diabetes, certain types of cancer, and other chronic disease for children and adults (Fox, Dodd, Wilson, & Gleason, 2009). The onset of these chronic diseases is much earlier in those who are overweight or obese at younger ages (Fox et al., 2009). Therefore, childhood obesity will have significant health, well-being, and fiscal costs associated with it, thus making its prevention important (Freedman, Zuguo, Srinivasan, Berenson, & Dietz, 2007; Huh, Rifas-Shiman, Taveras, Oken,& Gillman, 2011).

Many studies targeted schools in addressing their role in obesity prevention. Each study assessed schools from a different angle. However, one angle that has been ignored by the

researchers is assessing the impact and influence of school foodservice staff on childhood obesity prevention. A gap in the literature exists in addressing the nutrition related knowledge of school food service personnel, as well as their beliefs and current practices in relation to providing healthy foods in schools. This study will address those issues.

Multiple studies have targeted the school nutrition and dietary practices. Their findings indicate that vending machines, a la carte items, and fund-raisers that focused on food or beverage sales were negatively associated with the daily fruit and vegetable consumption and positively associated with daily total fat, saturated fat, and sugar consumption (Gordon & Fox 2007; Hartstein, Cullen, Reynolds, Harrell, Resnicow & Kennel, 2008; and Kubik, Lytle, Hannan, Perry & Story, 2003).

The development of obesity is related to energy imbalance between calorie intake and expenditure. Food and beverages consumed and physical inactivity significantly impacts this energy balance equation (Huh et al., 2011). According to the United States Department of Agriculture- Food and Nutrition Service (USDA/FNS), ninety-five percent of children attend public or private schools and sixty-six percent of these students participate in the National School Lunch Program (NSLP) (United States Department of Agriculture- Food and Nutrition Service, 2012). The Food Research and Action Center (FRAC) reported that the National School Lunch Program (NSLP) in 2010-2011 reached approximately 33.8 million children in more than 99,695 schools and residential child care institutions participated on a typical day. Twenty-two millions of these children received free and reduced-price lunch. This is the largest increase in lunch participation FRAC has ever recorded. Moreover, 11.7 million children in 87,814 schools participated in National School Breakfast Program (SBP) for the 2010-2011. Eighty-three percent of them received free and reduced price breakfast on the same school year

(The Food Research and Action Center, 2012). Roughly thirty-five percent and forty-seven percent of calorie intake is attributed to NSLP or both NSLP & SBP. This is significant and an area where policy and stakeholders can have influence (Fox et al., 2009).

Limitations of previous studies include the impact and influence of foodservice personnel working in the schools. The foods that foodservice managers chose to serve to children are known to have an influence. Fox et al., (2009) found that schools who served french fries and desserts more than one time per week had a higher likelihood of overweight and obesity in children. Gordon & Fox (2007) reported that student participation is one of the number one concerns of school foodservice managers. Serving a menu and foods that can compete with competitive foods available could be a major obstacle for NSLP and SBP (Gorden & Fox, 2007). Currently, no educational standards related to nutrition exist for foodservice managers. Roth-Yousey, Barno, Caskey, Asche & Reicks (2009) reported that providing continuing education for school foodservice personnel on whole-grains was found to improve menu placement and awareness, therefore suggested that nutrition knowledge influences foodservice menus. Moreover, Gross & Cinellie (2004) reported that limited preparation and serving space, in addition to insufficient meal periods, have also been noted to impact foodservice options and choices (Gross & Ginellie, 2004). It is vital to know the nutrition knowledge and attitudes of school foodservice personnel. It is also important to determine how to engage school foodservice personnel in identifying barriers and avenues of action in what changes can be made in the school nutrition program.

The Purpose of the Study:

This mixed method study was designed to address the nutrition knowledge, attitudes and perceptions of school foodservice personnel in Nebraska. Moreover, this study identified some potential barriers and avenues of action for decreasing likelihood of preventable diseases such as childhood obesity, cardiovascular diseases, hypertension, high blood cholesterol and type II diabetes. A convergent parallel mixed methods design was used, and it is a type of design in which qualitative and quantitative data were collected in parallel, analyzed separately, and then merged.

Quantitative Research Questions:**Central Question**

What are food service personnel attitudes toward serving healthy school meals?

Sub-Questions

1. What is the relationship between school food service personnel attitude and offering healthy school meals?
2. What is the relationship between school food service personnel self-efficacy and offering healthy school meals?
3. What are the barriers that face school food service personnel in order to offer and serve healthy school meals?
4. What is the relationship between nutrition related knowledge of school food service personnel and their current practices in relation to providing healthy foods in schools?

Qualitative Research Question:**Central Question**

How do food service personnel describe their attitudes toward childhood obesity in schools in Nebraska?

Sub-Questions

1. How do food service personnel describe their practices toward offering/serving healthy school meals?
2. How do food service personnel address barriers that prevent them from offering/serving healthy school meals?
3. How do food service personnel describe the importance of receiving nutrition education trainings in order to provide healthy school meals?

Mixed Method Approach Research Question:

How does nutrition related knowledge of school food service personnel affect their beliefs and current practices in relation to providing healthy foods in schools?

CHAPTER II

REVIEW OF LITERATURE

Socio-ecological Model and Childhood Obesity

The causes of childhood obesity are not individualistic or static, but complex and interrelated. Speakman (2004) cautioned that the obesity phenomenon is not just due to the environment or behaviors, while also indicating that there is not a direct link between our genes and our body weight (Speakman, 2004). The model put forth by Speakman depicts genes and the environment as “causal agents” impacting a multitude of other factors. Furthermore, Lytle (2009) describes a transdisciplinary conceptual model for the etiology of childhood obesity which is guided by the socio-ecological model (Lytle, 2009).

Animal and human studies favor the homeostatic and non-homeostatic process opposing weight loss, thus pointing us toward the best treatment for obesity being prevention (Levin, 2007). A possible avenue for prevention could be the closure of the energy gap over several years. In a Dutch study findings indicate that an energy gap of 289-320 kJ (70-76 kilocalorie) per day existed in children age 5-7 that had either moved from normal weight to overweight or maintained overweight status (van den Berg, Boer, Scholtens, Jongste, Brunekreef, Smith & Wijga, 2011)

Intervention efforts are difficult to implement and evaluate in a multifaceted causal relationship, such as obesity, that also develops over time. Studies demonstrate a possible family clustering of increased BMI trajectories. Studies by (Patel, Martin, Kramer, Oken, Bogdanovich, Matush, Smith & Lawlor, 2011; and Li, Law, LoConte & power, 2008) found excess BMI in parents were associated with higher BMI in offspring, suggesting that genetic and/or shared

familial environments might explain the cause. In a study review of Han, Lawlor, & Kimm (2010) also identify the need to focus on this energy gap. Previous family based intervention studies have been limited and not focused on energy balance for the current sedentary lifestyle. However, the family unit is a focused target that reaches many of the other behaviors feeding into the energy balance equation.

Childhood obesity and family's impacts:

The family environmental factor may have one of the biggest impacts on the weight status of children. The family environment extends not only from the child's immediate environment but also to the larger societal level as well (Ritchie, Welk, Styne, Gerstein & Crawford, 2005). Dietary intake as well as physical activity levels will be influenced by the family environment. Parental modeling of healthy eating and physical activity practices are recommended by Ritchie et al., (2005) to reinforce children to eat healthfully and be physically active.

The family environment has been the target of a significant amount of research over the years and interventions targeting families with obese children has seen positive results. There is a general consensus that interventions should involve the family unit; however, the parent's role is unclear (Golan, Kaufman & Shahar, 2006). Epstein, Paluch, Roemmich, and Beecher (2007) analyzed twenty-five years of family-based research studies to identify participant characteristics related to treatment success. Their research found that targeting parents was superior to a non-targeted control group. Their research recommends more changes in environment and advances in the interrelationships among psychosocial, behavioral, and biological processes (Epstein et al., 2007).

When parents were able to change their behaviors and lose weight there were positive effects on children's outcomes as well. Research that utilized parental weight changes to predict changes in child weight found consistent results to Epstein et al. (2007) study. Child weight change was the highest when parents lost more weight during a family-based behavior treatment program (Wrotniak, Epstein, Paluch & Roemmich, 2004).

The family environment and parental influence on physical activity is also important. Parental activity has also been shown to have a strong influence on children's physical activity levels (Moore, Lombardi, White, Campbell, Oliveria, & Ellison, 1991; and Freedson & Evenson, 1991). With more than sixty percent of adults not achieving the recommended amount of regular physical activity it could be easy to see why their influence may have a negative impact on children.

A review of correlates of physical activity of children and adolescents by Sallis et al. (2000) stated that of the twelve modifiable correlates identified by the Surgeon General's Report from 1996, nine were shown to consistently be associated with physical activity. Those nine included: perceived physical competence, intention, barriers, parent support, direct help from parents, support from significant others, program/facility access, opportunity to be active, and time outdoors. However, it was stated that many other significant variables associated with the correlates exist and that youth physical activity is a complex behavior determined by many factors. Sallis et al. (2000) also states there are some situations in which parents modeling is an important influence. However, those situations have yet to be identified. There was also little evidence from the current review by Sallis et al. (2000) to show whether mother's or father's physical activity was more related to the child's behaviors (Sallis et al., 2000).

Research from Kalakanis, Goldfield, Paluch, & Epstein, (2001) stated that parents' activity levels significantly independently predicted and improved the prediction of physical activity levels and amount of moderate to vigorous activity beyond other determinants of obese children's activity, such as age, gender, socioeconomic status, and percentage of overweight children and parents (Kalakanis et al., 2001).

Future research and public health initiative should focus on the family environment and helping to promote the parents as role models. Programs targeting parental behaviors and family environment that are focused on healthy eating and increased physical activity may have a promising future for preventing and reducing childhood obesity.

Childhood obesity and schools' impacts:

According to American School Health Association, schools play a critical role in addressing the physical, emotional, social, and environmental factors related to health and well-being that can affect learning (Basch, 2010). In addressing childhood obesity, schools alone cannot solve this epidemic but at the same time it is unlikely that childhood obesity rates can be declined without strong school based policies and programs to support healthy eating and physical activity. Many public schools in NE do not have policies or environments that encourage healthy eating and physical activity. To create sustainable behavior change among youth, schools should offer healthy foods and beverages in a variety of different settings including cafeterias, vending machines, concessions, meetings, fundraising, and other school functions (Finkelstein, Hill, & Whitaker, 2008).

Many studies targeted schools in addressing their role in obesity prevention. Each study assessed schools in a different angle. Gordon and Fox, (2007); Hartstein, Cullen, Reynold,

Harrell, Resnicow & Kennel, (2008); and Kubik, Lytle, Hannan, Perry & Story, (2003) have studied the school nutrition and dietary practices. Their findings indicate that vending machines, a la carte items, fund-raisers that focused on food or beverages sales were negatively associated with the daily fruits and vegetables consumption and positively associated with daily total fat, saturated fat, and sugar consumption (Gordon & Fox, 2007; Hartstein et al., 2008; Kubik et al., 2003).

According to 2010 state indicator report on physical activity, Rule 10 (Regulations and procedures for the accreditation of schools) requires that PE be taught on the elementary and middle school levels; however, it does specify how much time should be awarded to PE classes. Therefore, it has been noted a reduction in PE classes and many have been reduced from one semester to one quarter per grade level (CDC, 2010). Lee, Burgeson, Fulton & Spain (2007); Mahar, murphy, Rowe, Golden, shields, & Raedeke (2006) found recess on the elementary level has also been reduced and in some schools even eliminated in order to create additional time for reading and math. Also, less than ten percent of schools have a policy stating that physical activity cannot be used as a punishment.

With the passage of The Child Nutrition and WIC Reauthorization Act of 2004 authorizing the establishment of local school wellness policies, it was confirmed that schools play a critical role in promoting student health, preventing childhood obesity, and combating problems associated with poor nutrition and physical inactivity (School Wellness Policy Report, 2008). According to the federal law, school wellness policies have to address the following features (Smith, 2006):

- Nutrition and physical education
- Nutrition guidelines for all foods available during school day
- Assurance that guidelines for reimbursable school meals will not be less restrictive than federal regulations
- Involvement of parents, students and representatives of the school food authority in developing the school wellness policy
- Designate a person to be responsible of measuring the implementation of the local wellness policy

Childhood obesity and community's impacts:

As identified earlier, the premise of childhood obesity is a result of energy intake vs. energy expenditure. Community plays an important role in both of these factors. Energy expenditure is influenced by physical activity. Children's Independent Mobility (CIM) is a significant factor as research indicates that in the 1970s anywhere from 66%-80% of children traveled to school on their own. This number however has fallen to <10% in the 1990s (Waters, Swinburn, Seidell & uauy, 2010). Safe communities, well-built sidewalks, and school routes promote bicycling and walking both to and from school and encourage increased physical activity. Physical education classes during school hours and various opportunities for activity before and after school programs offer other methods for increasing energy expenditure. The availability of non-school related activities within the community, such as recreation centers, sporting clubs, dancing studios, parks, and others offer further opportunities for children to be active. School-based obesity prevention has shown mixed results; nevertheless, when implemented in combination with community programs it is much more effective (Hoelscher,

Springer, Ranjit, Perry, Evans, Stigler, & Kelder, 2010). Lastly, close-knit family centered communities can also promote active interaction between children in different families.

The community also has an impact on energy intake. Another need of the community is access to shopping centers that offer wide varieties of whole and unprocessed foods. These shopping centers encourage intakes of nutrient dense foods, while minimizing energy density. Children typically consume roughly thirty percent or more of calorie intake at schools through school lunch, vending machines, nearby fast food restaurants, and convenience stores. Community or school-based wellness programs within the community can assist in providing education regarding nutrition to families and help to increase healthy eating behaviors (Hoelscher et al., 2010).

In 2008, the Institute of Medicine established a committee on childhood obesity prevention actions for local governments. The ideas, strategies, and action steps presented by this committee provide an excellent framework for what would constitute an “ideal” small community environment for childhood obesity prevention. An ideal small community would have the following (Robert Wood Johnson Foundation, 2009):

- Provide planned, well-built, and safe sidewalks and bicycle routes, especially designed for use to and from school.
- Adequate recreational facilities and other non-school activities such as dance classes, city-sponsored sports, and supervised play.
- Fund a Community Center addressing issues of wellness. Services would include:
 - Education on physical activity, nutrition, and proper nutritional habits

- Promotion and marketing of resources within the community and collaborating with schools
- Collaboration with local farmers to encourage farmers' markets offered to local residents
- Implementation of a local garden

Childhood obesity and Policies

The No Child Left Behind Act was designed to place an emphasis on core subjects like reading and math by tying federal funding to the results of standardized tests on those subjects. The increased class time that was needed to prepare for those tests has led to sharp cut backs on physical education and even physical activity of some schools. Severe budget cuts and sacrificing physical education for classroom time have led to shifting resources away from health in general. The National Association for Sport and Physical Education recommendation for elementary students is 150 minutes/week of physical education. In Lincoln Public Schools, the maximum minutes of physical education that elementary students receive, is 90 minutes/week. Middle school students receive physical education four days/week. On the other hand, the students are offered physical education only one quarter of the year. Physical education requirements are low in high schools and often completed within the freshman year.

The other concern that affects the physical education in school system is removing physical education teachers due to the budgetary consideration and having classroom teachers teaching the class. The majority of these teachers are not certified in physical education. According to the Robert Wood Johnson Foundation (2009), there are several possible mechanisms by which physical education and regular physical activity could improve academic achievement, including enhanced concentration skills and classroom behavior. It would be very

beneficial for schools to have physical education teachers integrate physical education into the core curriculum (Robert Wood Johnson Foundation, 2009).

In Nebraska only one in five high school students (26%) engage in sufficient levels of both moderate and vigorous physical activity (Department of Health and Human Services, 2010). While physical education classes teach youth the skills necessary to engage in lifelong physical activity, less than one in every three Nebraska high school students attend physical education daily and engage in physical activity for more than twenty minutes during class. The National Association for Sport and Physical Education (2011) recommendation for elementary students is 150 minutes/week of physical education.

USDA's Food and Nutrition Services is working on the implementation of this policy which will begin during the school year of 2011-2012. It is authorizing the establishment of local school wellness policies for each school or school district. It is stated that the wellness policy must include the following: goals for nutrition education, physical activity, and other school-based activities that promote student health. Also, the policy provides nutrition guidelines for all foods to promote student health and reduce childhood obesity. Stakeholder involvement is a requirement in developing the school wellness policy which would include but not be limited to: a) Physical education teachers, b) school health professionals, c) representatives of the school food authority, d) school board, e) school administrators, f) parents, g) students and h) public. The guideline for implementation of this policy has not been released yet (United States Department of Agriculture, Food and Nutrition Services, 2011). The Nebraska Department of Education/Nutrition Services is hoping each local school wellness policy establishes a guideline that promotes healthy eating for the following areas:

1. Limitation of low-nutrient, energy-dense foods in vending machines

2. a la carte item sales
3. School stores
4. School celebrations
5. Fundraisers
6. Classroom rewards

Nutrient Intake Behavior of Nebraska Youth

Greater access to low-nutrient, energy dense competitive foods at school is associated with 1) increased intake of total calories, soft drinks, total fat, and saturated fat (Cullen K et al., 2000), 2) decreased intake of fruits, vegetables, milk and key nutrients (Cullen et al., 2003) and 3) an increase in BMI levels among middle school students (Kubik et al., 2003). According to 2011-2012 Youth BMI Surveillance Project Report, only one in four Nebraska 9th-12th grade students reported eating fruit at least twice per day and only one in nine students reported eating vegetables at least three times per day. Combined, only eight percent of 9th-12th grade students reported eating at least two fruits and at least three vegetables per day. According to the State Indicator Report, only one in five middle and high schools offer fruit and non-fried vegetables in vending machines, school stores, or snack bars. In Nebraska, only 10.9% of middle and high schools offer fruit and non-fried vegetables. Seventy-seven percent of high schools continue to sell regular soda and fruit drinks that are not 100% juice in their vending machines or school stores. Nearly one in three males and one in four females reported drinking a can, bottle or glass of soda/pop at least once a day. Additionally, one in four males consumes a sports drink at least once a day. Whereas, only one in five males and one in ten females consume milk at least three times a day. Finally, only thirty-three percent of schools in Nebraska prohibited all forms of

advertising and promotion of candy, fast food restaurants, or soft drinks in all locations
(Department of Health and Human Services, 2012).

Federal School Meal Programs

National School Lunch Program (NSLP)

The National School Lunch Program (NSLP) is one of the federal meal assistance programs that target public and nonprofit private schools and residential child care institutions nationwide. It provides nutritionally balanced, low-cost or free lunches to more than twenty-six million children each school day. Federally, the NSLP is administered by the U.S. Department of Agriculture through Food and Nutrition Service. In Nebraska, it is administered by the Nebraska Department of Education/Nutrition Services. Schools that participate in NSLP must meet the following criteria in order to receive cash reimbursement and donated commodity assistance from the USDA for each meal they serve (USDA/FNS, 2012):

1. Lunches must meet the federal nutrition requirements.
2. Free and reduced-price lunches must be offered to eligible children.
3. Meals must meet the Dietary Guidelines for Americans including no more than thirty percent of an individual's calories come from fat, and no more than ten percent from saturated fat.
4. School must provide one-third of the Recommended Daily Allowances of protein, Vitamin A, Vitamin C, iron, calcium, and calories.
5. The compliance of schools with both the Dietary Guidelines and the RDA's is measured over a week's menu cycle.
6. School must implement a Hazard Analysis Critical Control Point (HACCP) plan and receive at least two health inspections each year.
7. School districts must adopt a Local Wellness Policy. The policy must address the following:

- I. Policies targeting
 - Nutrition education
 - Physical activity
 - Other school-based activities to promote wellness
- II. Guidelines for reimbursable meals
- III. Nutrition guidelines for all foods at school
- IV. Plan for measuring implementation
- V. Community involvement

According to the Nebraska Department of Education, 333,001 Nebraska students have access to meals through the NSLP. This program continually updates the nutrition standards to ensure all schools meet the recommendations of the Dietary Guidelines for Americans. In order to enhance student food choices, USDA designed a nutrition program to teach students how to make healthy food choices and at the same time support the school food service staffs with skills they need to deliver healthy school meals. This program is known as Team Nutrition.

School Breakfast Program

School Breakfast Program is a federally funded program which also targets public and nonprofit private schools and residential child care institutions. This program operates in the same manner as the School Lunch Program. It is administered by the Nebraska Department of Education/Nutrition Services. Schools that participate in School Breakfast Program must meet the applicable recommendations of the Dietary Guidelines for Americans including no more than thirty percent of individual's calories come from fat and less than ten percent from saturated fat.

Schools must also provide one-fourth of Recommended Dietary Allowance for protein, calcium, iron, Vitamin A, Vitamin C, and calories (USDA/FNS, 2012).

After School Snack Program

The After School Snack Program (ASSP) is also one of the federal funded programs that are designed to provide healthy snacks for low-income students who participate in the after school program. Schools that participate in NSLP are eligible to qualify for reimbursement; however, the program must operate by only school districts or residential childcare facilities that participate in the NSLP. Moreover, schools must organize regular scheduled activities for students that included educational activities in order to be qualified for ASSP (USDA/FNS, 2012).

Fresh Fruit and Vegetable Program

The Fresh Fruit and Vegetable Program (FFVP) is federally administered by the Department of Agriculture's Food and Nutrition Service. In Nebraska it is administered by the Department of Education Nutrition Services. The goal of this program is to enhance the consumption of fruits and vegetables in elementary school children. Schools are awarded a specified amount for the grant to implement FFVP. This program is designed for low income schools that have fifty percent or more of students who receive free or reduced-price meals. In Nebraska, schools receive an educational kit that contains many nutritional lessons that help in increasing the consumption of fruits and vegetables. This educational kit is developed by both the Nebraska Department of Education and Department of Health and Human Service (USDA/FNS, 2012).

Summer Food Service Program

Summer Food Service Program (SFSP) is designed to provide a healthy, as well as balanced and nutritious, meal for low-income youth ages eighteen and under during summer when school is not in session. All the snacks and meals under SFSP must meet USDA nutrition standards; nonetheless, this program operates differently than NSLP and SBP. Locations that hold the summer feeding sites calls on sponsored sites. These sites can be schools, camps, park and recreation centers, YMCA, Head Start Centers, local health department and other sites. Each site can provide up to two meals, either a breakfast and lunch or lunch and supper or one meal and a snack. The SFSP not only provides a healthy meal to low income youth but also involves activities in the program such as sports and nutrition education. The program provides a healthy environment for low-income youth to continue obtaining nutritious food, education and activities when school is not in session which enhances their ability to begin a positive school year (USDA/FNS, 2012).

Commodity Food Program:

Commodity Food Program is known as USDA commodity foods in school lunch. This program is administered by the USDA's Food and Nutrition Service that support American agricultural producers by providing cash reimbursements for nutritious meals served in schools. NSLP, Child and Adult Care Food Program (CACFP) and Summer Food Service Programs are eligible to receive the USDA purchased foods. The national commodity meal average rate for the period July 1, 2012-June 30, 2013 is *22.75 cents* for NSLP and CACFP (USDA/FNS, 2012).

2012 New Meal Pattern-School Lunch and Breakfast Programs

Federal Register/Vol. 77, No.17/Thursday, January 26, 2012/Rules and Regulations

The Healthy, Hunger-Free Kids (HHFK) Act of 2010 is one of the bills that were signed by President Obama in 2010 which made significant improvements to the NSLP and SBP. This legislation establishes new nutrition standards for schools that align with the 2010 New Dietary Guidelines for Americans. The final rule requires most of the schools to increase the availability of fruits, vegetables, whole grains and fat free and low-fat fluid milk in school meals. Moreover, the final rules require reducing the levels of sodium, saturated fat, and trans fat in school meals, as well as meeting the nutrition needs of school children within their calorie requirements. The main purpose of these changes in school meals is to enhance the diet and health of school children and prevent childhood obesity. All the new nutrition standards for school meals are based on recommendations made by the Institute of Medicine of the National Academics.

In order to implement the new nutrition standards for children in grades Kindergarten and above, schools must meet the following new meal pattern requirements:

- School menus are based on five food components
- Fruits and vegetables are two separate food components
- Daily fruits requirements
- Daily serving of vegetables plus a weekly requirement for dark green, red/orange, beans/pea (legumes), starchy, and “other” vegetables
- Weekly meat/meat alternate ranges plus a daily requirement
- Weekly maximum grains ranges plus daily minimum requirement
- Half of the grain offered must be whole grain-rich beginning July 2012. All the gains must be whole grain-rich by SY 2014-2015

- Fat-free (unflavored or flavored) and unflavored low-fat milk only
- Calorie minimum and maximum levels
- Trans fat limit
- Limit on saturated fat
- Intermediate and final sodium reductions

Table 1 shows the nutrition standards in the NSLP and its implementation and timeline for final rule.

Meal Pattern	Grades K-5	Grades 6-8	Grades 9-12
	Amount of Food Per Week (Minimum Per Day)		
Fruits (cups)	2 ½ (1/2)	2 ½ (1/2)	5 (1)
Vegetables (cups)	3 ¾ (3/4)	3 ¾ (3/4)	5 (1)
Dark green	½	½	½
Red/Orange	¾	¾	1 ¼
Beans/Peas (Legumes)	½	½	½
Starchy	½	½	½
Other	½	½	¾
Additional Vegetables to Reach Total	1	1	1 ½
Grains (oz eq)	8-9 (1)	8-10 (1)	10-12 (2)
Meats/Meat Alternates (oz eq)	8-10 (1)	9-10 (1)	10-12 (2)
Fluid Milk (cups)	5 (1)	5 (1)	5 (1)
Other Specifications: Daily Amount Based on the Average for a 5-Day Week			
Min-max calories (kcal)	550-650	600-700	750-850
Saturated fat (% of total calories)	<10	<10	<10
Sodium (mg)	≤640	≤710	≤740
Trans fat	Nutrition label or manufacturer specifications must indicate zero grams of <u>trans</u> fat per serving.		

Table 2 shows the nutrition standards in the SBP and its implementation and timeline for final rule.

Meal Pattern	Grades K-5	Grades 6-8	Grades 9-12
	Amount of Food Per Week (Minimum Per Day)		
Fruits (cups)	5 (1)	5 (1)	5 (1)
Vegetables (cups)	0	0	0
Dark green	0	0	0
Red/Orange	0	0	0
Beans/Peas (Legumes)	0	0	0
Starchy	0	0	0
Other	0	0	0
Additional Vegetables to Reach Total	0	0	0
Grains (oz eq)	7-10 (1)	8-10 (1)	9-10 (1)
Meats/Meat Alternates (oz eq)	0	0	0
Fluid milk (cups)	5 (1)	5 (1)	5 (1)
Other Specifications: Daily Amount Based on the Average for a 5-Day Week			
Min-max calories (kcal)	350-500	400-550	450-600
Saturated fat (% of total calories)	<10	<10	<10
Sodium (mg)	≤430	≤470	≤500
Trans fat	Nutrition label or manufacturer specifications must indicate zero grams of <u>trans</u> fat per serving.		

Health Belief Model

The Health Belief Model (HBM) is one of the social cognition models which is very widely used to explain health-related behavior. This model was developed in the late 1950s by three social psychologists: Godfrey Hochbaum, Irwin Rosenstock, and Stephen Kegels. This model suggests that individual belief in a personal threat together with belief in the effectiveness of the proposed behavior will predict the likelihood of that behavior. Originally, HBM was developed for studying and promoting the uptake of health services suggesting four key concepts: perceived susceptibility, perceived severity, perceived benefits, and perceived barriers. Recently, two extra components were added to the HBM structure including cues for action and self-efficacy (Fisher, Walker, Bostrom, Fischhoff, Haire-Joshn, & Johnson, 2002).

- I. Perceived susceptibility: individual's beliefs about the likelihood of getting a certain disease or health condition
- II. Perceived severity: individual's beliefs about the seriousness of the disease or health condition
- III. Perceived benefits: individual's beliefs that a certain action will reduce risk of that disease or health condition
- IV. Perceived barriers: individual's beliefs about negative aspects of the action
- V. Cues for action: instigator to readiness
- VI. Self-efficacy: individual's beliefs in his/her ability to take action to produce desired outcomes

Definition of Key Terms

BMI: Body Mass Index is a reliable indicator of body fatness which can be calculated from a child's weight and height.

Healthy School Meals: Meals that meet the 2010 new school meal pattern which reflect the 2010 Dietary Guidelines for Americans.

Obese: BMI (age 2-18 years) is equal to or greater than the 95th percentile.

Overweight: BMI (age 2-18 years) is at 85th to less than 95th percentile.

Saturated fat: Saturated fatty acids are most commonly found in animals. They tend to be solid at room temperature. Saturated fat is one of the fatty acids that contain the maximum number of hydrogen atoms.

Trans fat: Naturally occurring in beef, lamb and dairy product. Trans fat is a byproduct of partial hydrogenation, a process that adding hydrogen back into liquid oils to form solid fats like shortening and hard margarine.

Whole grain: Foods made from the entire grain kernel, which consists of the bran, germ and endosperm. Whole grain products must contain at least 16 grams of whole grain per serving.

Whole grain-rich: It is a blend of whole grain and/or flour and enriched flour. WGR must contain at least 50% of WG and the remaining must be enriched. WGR products must contain at least 8 grams of whole grain per serving.

CHAPTER III

METHODOLOGY

Study Design

The purpose of this project was to assess the nutrition knowledge, perceptions, and attitudes of foodservice personnel in Nebraska and to identify potential barriers and avenues of action for decreasing likelihood of preventable diseases such as childhood obesity, cardiovascular diseases, hypertension, high blood cholesterol and type II diabetes. A mixed methods approach was utilized in this study. Mixed methods research can be defined in many different ways; nonetheless, most definitions capture the important concept that elements of both qualitative and quantitative research designs are combined (Creswell & Clark, 2011). Qualitative and quantitative approaches to research both have their respective strengths. Qualitative approaches provide rich detail and insight while quantitative yield statistical verification and generalization. When using mixed methods, the researcher seeks to maximize the knowledge gained from each type and it provides more than either approach could by itself. This mixed method study addressed the nutrition knowledge, attitudes, and perceptions of school foodservice personnel in Nebraska. Moreover, this study identified some potential barriers and avenues of action for decreasing likelihood of preventable diseases such as childhood obesity, cardiovascular diseases, hypertension, high blood cholesterol and type II diabetes. A convergent parallel mixed methods design was used, and it is a type of design in which qualitative and quantitative data are collected in parallel, analyzed separately, and then merged. In this study, quantitative data was collected first during the first and second phases. Data surveys were collected from the school food service directors/managers who are involved in service delivery for school meals in Nebraska. The third phase which was a focus group was conducted to

explore the beliefs and current practices of school food service personnel. The reason for utilizing both quantitative and qualitative methods, instead of using either type of data separately, is to merge the two forms of data in hopes of gaining greater insight regarding the problem.

Quantitative Research Questions:

Central Question

What are foodservice personnel attitudes toward serving healthy school meals?

Sub-Questions

1. What is the relationship between school foodservice personnel attitude and offering healthy school meals?
2. What is the relationship between school foodservice personnel self-efficacy and offering healthy school meals?
3. What are the barriers that face school foodservice personnel in order to offer and serve healthy school meals?
4. What is the relationship between the nutrition related knowledge of school foodservice personnel and their current practices in relation to providing healthy foods in schools?

Qualitative Research Question:

Central Question

How do food service personnel describe their attitudes toward childhood obesity in schools in Nebraska?

Sub-Questions

1. How do food service personnel describe their practices toward offering/serving healthy school meals?
2. How do food service personnel address barriers that prevent them from offering/serving healthy school meals?
3. How do food service personnel describe the importance of receiving nutrition education trainings in order to provide healthy school meals?

Mixed Method Approach Research Question:

How does nutrition related knowledge of school food service personnel affect their beliefs and current practices in relation to providing healthy foods in schools?

Philosophical Foundations of Convergent Parallel Mixed Methods:

This study is more associated with the pragmatism category. Pragmatism worldview's focus, according to Teddlie & Tashakkori (2009), is on the consequences of the research, i.e., on the research question rather than the methods. It encourages multiple methods (both quantitative and qualitative) for data collection to explore the problem under the study. There is a value of both quantitative and qualitative approaches. Within the pragmatic paradigm, answering the research question using the best method or combination of methods is paramount. It's an analysis of the question, not the process or the researcher. Data from the focus group (qualitative method) will give broad understanding of the research problem whereas data from the surveys (quantitative study) will help with generalization. Pragmatic world view by mixing both qualitative and quantitative method overcomes the drawbacks of both the methods and thus

provides with a rich understanding of the problem. This line falls into a grayer area when it comes to program evaluation. In the Human Services, there is clearly a need for mixed methods in combining the quantitative data and the personal touch and opinion of clients receiving services (qualitative research). Both qualitative data and quantitative methods will be collected to identify the relationship between the nutrition knowledge of school food service personnel and school food environment, attitudes of school food service personnel toward offering healthy school meals, and barriers that face school food service personnel in order to offer and serve healthy school meals.

Significance of the Study

The literature contains very limited research on the knowledge, practices, attitude and self-efficacy of school foodservice personnel. Many individuals could potentially value the data of this study. School administrators could benefit from the findings of this study to 1) address the barriers that were identified by school foodservice personnel, 2) evaluate school wellness policies, 3) establish partnerships with communities and universities for intervention, and 4) provide professional development opportunities for school foodservice personnel. Additionally, data of this study might benefit the Child Nutrition State agencies to 1) establish educational standards related to nutrition for the school foodservice managers/staff, 2) develop and formulate proper trainings and workshops for the new school foodservice employees, 3) offer continual education opportunities for the existing school foodservice personnel and 4) provide evidence of the importance of receiving the Team Nutrition Grant funds and other grant opportunities that target school foodservice personnel.

Ethical Considerations:

Permissions from the Institutional Review Board (IRB) and Nebraska Department of Education were obtained to conduct two surveys and two focus group sessions (**Appendix A**). Data obtained from the quantitative and qualitative methods were used for research purpose only and will be kept strictly confidential. All Survey Monkey data were collected from online report. All survey paper data is filed and will be maintained in a locked file cabinet at the University of Nebraska-Lincoln. Subjects were identified by code only. Prior to participating in paper survey, participants received the opportunity to give informed consent. All the participants were informed about the purpose and procedures used during the research study and their right to ask questions or quit at any time. Whereas, participants who responded to the on-line survey were asked to agree to informed consent by checking “agree” on the page prior to the survey form. In regards to the qualitative method, participants were asked first to complete the informed consent. Each individual was informed about his/her right to decline their participation in this study at any time of the study and had to leave the room during the discussion. Moreover, participants were informed that the discussion will be audio recorded and they were on a first name basis. They were also informed that their responses would remain anonymous and the study report would not attach any names to comments. The primary investigator notified participants of the focus groups about the purpose and the procedure of the study.

Phase I: On-line Survey

Participates and Data Collection

A convenience sample was selected for conducting an online survey. Participants for the survey were recruited with the help of Nebraska Department of Education. The survey was entered into Survey Monkey and delivered electronically through NDE/listserv. The survey then was sent to school foodservice directors (n= 411) in Nebraska who participate in National School Lunch Program (NSLP).

Validity Procedure

A link to an electronic survey was provided to all the school foodservice directors. For the purpose of validation and modifications of the survey, the questions of the survey were reviewed by three experts in the field of school foodservice at the Nebraska Department of Education/Nutrition Services and one expert in field of Data, Research, Evaluation and IT at NDE. Reliability of the instrument was accomplished through pilot testing prior to administration. The pilot group consisted of a convenience sample of six (n=6) sites of school foodservice directors in Nebraska that were not included in this study. The subjects of the pilot test were from rural and urban locations that represented a total of (n=4,099) students. The other purpose of pre-testing the survey was to validate the survey questions, estimate the time for completing the survey, and assess the readability of the questions.

Instruments:

Twenty-three questions were developed for this phase that targeted school food service directors. Data was collected through the use of a survey (**Appendix B**) during this phase. The questions were adopted from “Alliance for A Healthier Generations Assessment Tool”, CATCH study and School Food Service Management Institutes. All the questions were modified to meet

the purpose of our study. The first two questions assess schools and the attitudes of their food service staff toward adding and serving healthier food choices to the school menus and a la carte items. Question 3 and 4 assess the major barriers that prevent schools from preparing and purchasing foods that are lower in fat and sodium content. Questions 5, 6, 7, 8 and 9 help to assess the practices of school foodservice staff in promoting food from USDA programs and selling foods from national or regional brand-name or chain restaurants, such as McDonald's, Burger King, Taco Bell, Pizza Hut, Domino's or Subway. In order to assess the school foodservice staff practices in reducing fat and sodium content of their school menus, questions 10, 11 and 13 illustrated these practices. Question 12 consisted of four sub-questions. This question is developed in evaluating the nutrition knowledge of the school food service staff. Questions 14, 15, and 16 will help to identify individuals who have control over vending machines in schools. Five questions were developed to assess the level of education of the school food service staff and their experience in nutrition and school food service which were illustrated in questions 17-21. And finally, questions 22 and 23 assess the interest level of the school food service staff in receiving nutrition trainings and workshops.

Phase II: Paper Survey

Participates

A convenience sample was selected for conducting the paper survey. Participants for the survey were recruited with the help of Nebraska Department of Education. This survey was administered in the form of paper copies to all the school food service personnel who participated in a school nutrition training workshop that were developed by the Department of Education/ Nutrition Services.

Validity Procedure:

For the purpose of validation of the survey, the questions were reviewed by three experts in the field of school foodservice at the Nebraska Department of Education/Nutrition Services and one expert in field of Data, Research, Evaluation and IT at NDE. Additionally, the survey was pre-tested by three (n=3) school foodservice personnel to validate the survey questions, estimate the time for completing the survey, and assess the readability of the questions.

Data Collection Procedure

Thirteen questions were developed for the second phase of the quantitative method. With releasing the new school meal pattern, the Nebraska Department of Education has developed a six-hour training for all of the school food service personnel; these trainings were held in Lincoln, Omaha, Kearney, Norfolk, North Platte, Scottsbluff, and Grand Island. The survey was conducted in the forms of paper copies at the trainings to reach a diverse group of audiences who work in school foodservice settings. The purpose of developing and conducting this survey was 1) to supplement the online survey to assess the participant's knowledge, attitude, and practices in serving healthy school meals, 2) to reach more school foodservice personnel since the online survey was sent to only school foodservice directors and 3) to add more knowledge questions since the online survey knowledge questions covered only whole grains.

Instrument

The second survey consisted of thirteen questions. The developed questions were based on the health belief model to assess the participants' attitude, practices, and the level of self-efficacy toward serving healthy meals in their schools. Additionally, two questions target participant's demographic information and were included in the survey as well (**Appendix C**). All the data was collected and used quantitatively.

Phase III: Interviews

Participants

A purposeful convenience sample was selected for conducting two focus group sessions. Participants for the focus group were recruited with the help of Nebraska School Nutrition Association and Nebraska Department of Education. The Nebraska School Nutrition Association agreed to provide a list of registrars who will attend Nebraska School Nutrition Annual Conference in September. This conference was designed for School foodservice directors, managers, staff and others who work with the School Nutrition Program across the state of Nebraska. This strategy helped to recruit participants with diverse ethnic, racial, geographic locations, and school foodservice work experience. Twenty participants were recruited for this study who met criteria of being employed in the school food service setting and actively participated in NSLP.

Data Collection Procedures

A phone call was made to contact the recruited participants by the primary investigator who works at the Nebraska Department of Education. The recruited participants were informed about the purpose of the study as well as the following information if they are interested in participating: date, time, duration and the location of the focus group. A letter of confirmation was sent to all of the recruited foodservice staff who agrees to participate in the focus group. Another phone call was made two days prior to the conference to remind the participants about the focus group time and location. Five participants declined to participate in the study. The participants were asked first to complete the informed consent. Next, the participants were informed that the discussion was audio recorded to avoid missing any information. Also,

participants were advised to speak one at a time and everyone get a chance to voice their opinion. Participants were informed that they were on a first name basis and the study reports will not attach any names to comments. Participants' responses were kept private. Moreover, participants were informed that there are no right or wrong answers but rather differing points of views and opinions. They were encouraged to share their point of view or opinion even if it differs from what others have said.

Qualitative Instrument:

Thirteen questions were developed to identify the relationship between the nutrition knowledge of school foodservice personnel and the school food environment, attitudes of school food service personnel toward offering and serving low-fat and low-sodium school meals, and barriers that face school foodservice personnel in order to offer and serve healthy school meals **(Appendix D)**. The interviews were audio-tape recorded to capture all of the information shared during the focus group sessions. Data from the interview was transcribed verbatim followed by coding the data by segmentation and labeling the text to develop themes. The aim was to conduct two focus group sessions. Each focus group sessions lasted less than one hour, and the sessions were conducted at the NE SNA annual conference location for the convenience of the participants.

Data Analysis Procedure:

Quantitative Analysis

Data collected from the surveys was converted into an Excel spreadsheet and transferred into Statistical Package for Social Sciences version 20.0 (SPSS) at the NEAR center at the University of Nebraska-Lincoln. The quantitative data were correlational and descriptive in nature. Descriptive statistics including frequencies, means, and standard deviations were computed. Internal consistency was measured to determine the intercorrelations between the items measuring practices, knowledge and self-efficacy. Additionally, a t test was used to calculate correlations between variables. Frequencies and percentages were utilized to assess the variables. Regression analysis was used to predict serving/offering healthy school meals based on current nutrition knowledge and practices of school foodservice personnel. Several types of statistical analysis were also utilized and a confidence level was set at ($p < .05$). Cronbach's Alpha was measured for the survey in phase II to determine the level of reliability for questions related to practices, knowledge, attitude and self-efficacy. The alphas were likely below the accepted cut-off of .7 because some of the scales had few items. Table 3. Shows the reliability measurement for each category.

Table. 3 Reliability measurement of the second survey

Category	Cronbach's Alpha
Practices	.468
Knowledge	.518
Attitude	.729
Self-efficacy	.675

Qualitative Analysis

The data collected from the focus groups was audio recorded and transcribed by hand. Transcripts were analyzed using a qualitative software package named MaxQDA. Transcripts were coded and emerged into themes. Quotes were also collected and utilized.

Validity Procedure:

In order to determine the accuracy of the qualitative study finding, Creswell (2007) and Merriam (2009) suggest many strategies including the subsequent: triangulation, member check, adequate engagement in data collection, rich, thick description, reflexivity, peer debriefing, and external auditor. Three strategies were approached for validation of the qualitative finding of this study.

1. Peer review or debriefing sessions, which were provided by a) Dr. Wanda Kouszeswski who was affiliated with this study as the second investigator and the doctoral advisor of the primary investigator and b) Dr. Bev Benes who was not affiliated with this study. Both individuals reviewed the qualitative data and asked questions about the findings.
2. Member-checking was used as a validation technique. The final report of the described themes sent to two participants of the focus group to determine the accuracy of the researcher interpretation.
3. Researcher reflexivity was used as the third validation strategy. The researcher has been working with the Child Nutrition/ National School Lunch Program for over two years and understood how the school foodservice personnel interacted and worked together through much of the process.

CHAPTER IV

RESULTS

Phase I:

Participants Profile:

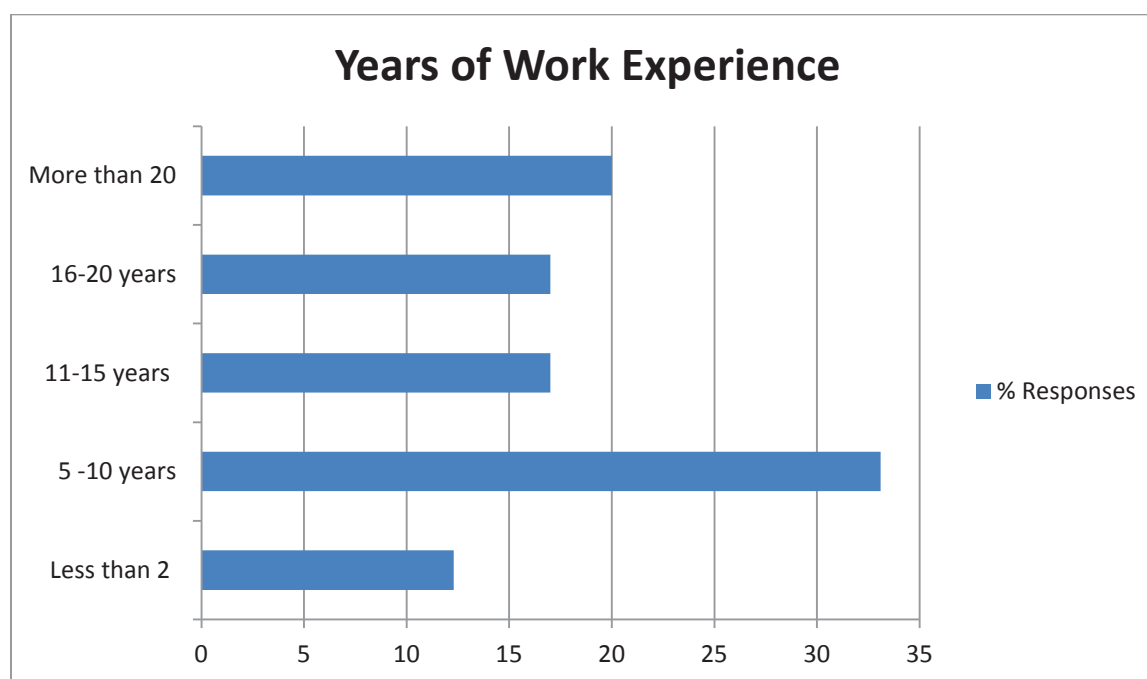
This section reports the findings of the online survey that consisted of twenty-three (n=23) questions. The survey was sent in spring 2012, to four hundred and twelve (n=412) school foodservice directors in Nebraska. Two hundred and twenty (n=220) directors opened the survey, however only one hundred and ninety-eight (n=198) participants agreed to complete the survey. The questions of the survey assessed the attitude, barriers, practices, and knowledge level of the participants. Additionally, the survey assessed the participants' level of education and their credentials. The survey classified the level of education into two main categories: nutrition and consumer science and related area degree and unrelated to nutrition and consumer sciences areas. The majority of the participants (57%) had attended some college within the areas that is unrelated to nutrition and consumer sciences. Whereas, nineteen (22%) of the participants held an Associate's Degree, seventeen (20%) held a Bachelor's Degree and only two participants (2%) held a Master's Degree in unrelated to nutrition and consumer sciences. In regards to the nutrition and consumer science and related area, twenty-four (47%) of the participants had some college degree. Sixteen participants (31%) with an Associate's Degree, fifteen participants (8%) with a Bachelor's Degree, six participants (3%) with a Master's Degree and only five participants (5%) were registered dietitians. The survey also assessed the participants' work experience level in school foodservice area. Thirty-three participants (20 %) had more than twenty years of work experience in school foodservice area, twenty-eight

participants (17%) had between eleven to fifteen years of experience, twenty-eight participants (17%) had between sixteen to twenty years of experience, fifty-four participants (31%) had between five to ten years of experience and only twenty participants (12%) had less than two years of work experience in school foodservice area.

Table 4. Shows the distribution of the participants based on their educational level.

Areas of Education	Master Degree (%)	Bachelor Degree (%)	Associate Degree (%)	Some College (%)	Response Count
Nutrition & Consumer Science and related area	5	15	31	47	51
Unrelated to Nutrition & Consumer Science area	2	20	22	57	84

Figure 1. Shows the distributions of the study participants based on their level of work experience in school foodservice area.



Attitudes:

Two questions were developed to assess the participants' attitudes toward serving/offering healthy school meals. The first question stated as follows: "Why do you think schools in general are hesitant to add healthier food choices to their menus?" The majority of the participants (77%) believe that healthier foods cost more and one hundred and eleven participants (62%) believe that students are less likely to buy healthier items. Fifty-four respondents (30%) indicate that healthier foods take more time in preparation and service whereas forty-four participants (24.6%) believe that lack of knowledge on how to prepare healthier foods is another factor that leads schools to be hesitant to add healthier food choices to their menus. Interestingly, forty-two participants believe that things are fine as they are and no change is needed to their school menu. Students are less likely to buy healthier items, requires more equipment or different equipment than what is in place, and requires a change in kitchen layout were additional factors that were selected by thirty-four, twenty-six and nine participants respectively.

The second question that targeted the foodservice attitudes was to seek their perception toward adding healthy a la carte items in their schools. One hundred and twenty participants (72.7%) believe that students are less likely to buy healthier items whereas one hundred and eleven (67%) participants agreed that healthier foods cost more. Only twenty-two participants (13%) believe that "things are fine as they are" in their a la carte items. Table 5 illustrates the participants' frequencies regarding their attitude toward adding healthy food choices to their school menus and a la carte items.

Table 5. Frequencies regarding their attitude toward adding healthy food choices to their school menus and a la carte items.

Factors	% responses to add healthy choices in school menus	% responses to add healthy choices in school a la carte items
Assumption/belief that “things are fine as they are”	23	13
Students are less likely to buy healthier items	62	72.7
There is a lack of available healthier products	19	23
Healthier foods take more time in preparation and service	30	15.8
Lack of knowledge on how to prepare healthier foods so kids want to eat them	24.6	11.5
Requires more equipment or different equipment than what is in place	14.5	4.8
Healthier foods cost more	77	67
Requires a change in kitchen layout	5	0.5

The survey also allowed the participants to comment and share their concerns regarding serving /offering healthy school meals. Table. 7. Contains more comments regarding attitudes toward serving/offering healthy school meals. One of the participants remarked the following comment regarding adding healthier food choices to school meals::

“Our students have very particular foods that they will eat, some will not try new things that look different. I think we fear that we will be paying more for healthier items and throwing them away. To be asked to try new items is one thing, to be forced by law to add and subtract food items-we spend more time than ever on the planning; only adding to our expenses of book work, which is already getting more burdensome. Gradually and moderately would be the best way to try to convince students to try new things.”

Barriers:

The participants were also asked to indicate the main barriers that prevent them from purchasing foods lower in fat and sodium. The survey contained many barrier options for the participants to select. One hundred and one respondents (61%) agreed that the *cost* of the foods lower in fat and sodium is their main barrier that prevents them from purchasing these types of food items. Whereas ninety-four participants (57%) indicated that student food preferences is one of their barriers that prevent them from purchasing food items that are lower in sodium and fat. When the participants were asked to indicate the main barriers that prevent them from preparing foods lower in fat and sodium, ninety –four participants (59%) pointed out the student food preferences. Moreover, seventy-one participants agreed that cost of the food that are lower in fat and sodium is high which prevent them from preparing them at schools. Table 6. shows the distribution of the participants that selected barriers which prevent them from purchasing and preparing foods that are lower in fat and sodium.

Also, participants were able to share some to the barriers that prevent them from purchasing foods that are low in fat and sodium. Table. 7. Contains more comments regarding barriers that prevent schools from purchasing foods that are low in fat and sodium. Below are some comments from different participants:

“The kids complain about the bland taste.”

“Lack of availability of products that are acceptable in terms of taste.”

“Vendors don't always have products with lower fat, sodium, or sugar.”

“It takes time to re-specify bid items, test the items and procure properly, then add to inventory, etc.”

Additionally, the participants shared some barriers that prevent them from preparing foods that are low in fat and sodium. Table. 7. Contains more comments regarding barriers that prevent school from preparing foods that are low in fat and sodium. The following comments were made by different participants:

“We have been decreasing the fat and sodium in our foods. But there is a point of 'no return' where the flavor isn't there.”

“Need to re-standardize recipes and that this involves, including purchasing and training staff.”

“Commodity program needs to add choices that are lower in fat and sodium.”

Table 6. Distribution of the participants that selected barriers which prevent them from purchasing and preparing foods that are lower in fat and sodium.

Barriers	% responses that prevent them from purchasing foods are lower in fat & sodium	% responses that prevent them from preparing foods are lower in fat & sodium
Student food preferences	57	59
Lack of student support	29	30
Lack of parent support	7.9	8.8
Lack of teacher support	4	3.8
Lack of administrative support	6.7	6
Lack of foodservice staff support	6	9
Lack of ingredients	10.9	11.9
Lack of adequate training	8.5	16
Cost	61	44.7
School meal requirements	12.7	10.7
Not enough time	8.5	17

Practices:

The online survey included eleven questions that were developed to assess some of the practices that foodservice directors perform in their schools. Respondents were asked to indicate whether the school menus are planned at the district level. One hundred and nine participants (75%) reported that they the school menus are planned at the district level whereas forty-three (25%) indicate that the menus are not planned at the district level. The participants were

provided with the following question regarding selling foods from restaurants: ***“Does your school sell foods from national or regional brand-name or chain restaurants, such as McDonald’s, Burger King, Taco Bell, Pizza Hut, Domino’s or Subway?”*** The majority of the participants (88.7%) indicated that they do not sell foods from the mentioned restaurants. Only a small percentage (11%) sells food from the above restaurants in their schools. This percentage was asked to move to the next question of the survey to determine the frequency of selling these food items in their schools. Three participants reported that they sell these foods every day and only one participant indicated that they sell these foods twice a week in their schools. The rest of the respondents indicated that (n=7), (n=5), and (n=3) sell these foods in their schools as follows: once a month, twice a week, and twice a month, respectively.

The survey also included two questions that targeted participants’ practices regarding activities that foodservice personnel were involved in their schools during the past twelve months. The majority of the participants (76%) invited family members to eat a school lunch with their children, 47% provided families with information about the school food service program, 34% conducted a nutrition education activity in the food service areas, 22% participated in a nutrition education activity in the classroom, and 18% attended a PTA or other parent group meeting to discuss the school foodservice program. One of the participants remarked the following comments regarding promoting healthy school meal:

“I would like to do nutrition activities in classroom or food service area, but not enough time!”

The second question stated as follows: ***“Do you use any of the following ways to get feedback from students or parents about USDA reimbursable meals?”*** Only seventy-five participants answered this question and the rest of the participants skipped the question. Most common respondents (68%) for this question were using “surveys” to get feedback from students or

parents about USDA reimbursable meals. The suggestion box, bulletin board, and web page were other ways to communicate with the students or parents and the respondents were as follows: 24%, 17%, and 29%, respectively.

The survey also contained two questions that solicited the participants' practices regarding reducing fat and sodium content in their school menus. Eighty-four percent of the participants reported that draining fat from cooked meat was one of their strategies to reduce the amount of fat content in their menu. The same percentage of the of the participants agreed that using skim, low fat, or nonfat dry milk and using non-stick coating spray or pan liner were their other strategies to cut down the amount of fat content in their school menu. In regards to reducing sodium content in school menus, participants practiced the following strategies: 84% reduce the salt in recipes or eliminate, 83% reduce or eliminate salt added to vegetables, 79.5% increase use of the fresh, frozen, and dried fruits, 76.6% increase use of fresh, frozen or unsalted canned vegetables and salads, 60.8% drain canned vegetables to reduce sodium content, 33% use water, beef base seasoning (low sodium when possible), and flour, or make a dry roux for gravy, and 22.8% drain canned meat, poultry and seafood. Table 7. Shows the frequencies of the respondents based on the selected strategies.

Table 7. Frequencies of the respondents based on the selected strategies.

Strategies in reducing fat contents in school menus	% respondents	# of respondents
Drain fat from cooked meat	84	146
Bake, broil, or roast cooking method	81.5	141
Defat broth	22	38
Reduce the amount of regular cheese or mix part-skim with regular cheese	64	111
Remove skin and fat from chicken and turkey	28.9	50
Trim all visible fat from beef and pork before cooking it	24	42
Try adding peas and dry beans to entrée and salad recipes	23.7	41
Eliminate butter, oil, margarine, and animal fat and replace with vegetable oil	42	73
Use low fat products	64	111
Use non-stick coating spray or pan liner	84	146
Use skim, low fat or nonfat dry milk	84	146
Use egg whites	1.7	3
Strategies in reducing sodium content in school menus	% respondents	# of respondents
Reduce the salt in recipes or eliminate	84	145
Use water, beef base seasoning (low sodium when possible), and flour, or make a dry roux for gravy. Do not add pan drippings	33	57

Drain canned meat, poultry, and seafood	22.8	39
Increase use of fresh, frozen, and dried fruits	79.5	136
Drain canned vegetables to reduce sodium content	60.8	104
Increase use of fresh, frozen, or unsalted canned vegetables and salads	76.6	131
Reduce or eliminate salt added to vegetables	83	142
Use more garlic, onion, powder, herbs, and spices	0	0

The survey also included one question that pursued the participants' perception regarding their current practices in different categories of school meals and a la carte (Table. 6). The category list included the follows: low fat content in food/snacks, low sodium content in foods/snacks, adequate fruits and vegetables, baking instead of frying, add more fiber/whole grains, appropriate portions as written in recipes, and limited use of sugar and sweeteners. The majority of the participants reported that there are no changes recommended in areas of adding fruits and vegetables, using baking instead of frying, using appropriate portions as written in recipes and limiting the use of sugar and sweeteners, 81%, 87% ,72.9% and 66%, respectively. While 54% believe that they could do better in lowering fat content in foods and snacks that are served in school meals; 62% reported that they could do better in lowering sodium content in foods and snacks that are served in school meals. Table 8. Highlights these results.

Table 8. Participants' responses regarding their practices in school menus and a la carte items.

Category	Could do better in school meals	Could do better in the a la carte line	No changes recommended
Low fat content in food/snacks	54 % (87)	27.5% (44)	35% (56)
Low sodium content in foods/snacks	62% (99)	27% (43)	30.8 (49)
Adequate fruits and vegetables	14.5 % (23)	8 % (13)	81% (129)
Baking instead of frying	11.5 % (18)	7% (11)	87% (136)
Add more fiber/whole grains	50 % (81)	15.5% (25)	44.7 % (72)
Appropriate portions as written in recipes	25.8% (40)	3.9% (6)	72.9% (113)
Limited use of sugar and sweeteners	27 % (43)	14% (22)	66 % (104)

The survey also included three questions that solicited current practices of school regarding vending machines. The first question stated ***“Who receives the revenue or profit from vending machines?”*** Approximately half of the participants (47.6%) were unaware of who receive the revenue from the vending machines whereas 23% of the participants reported that the revenue and profit of vending machines goes to the school foodservice department, 23.7% participants reported that the school is in charge of the vending machines, 11.5% participants selected athletic department receive the revenue, and 18% of the participants answered that student organizations receive the revenue from the vending machines. The second question looked for the location of vending machines and their availabilities to students on the school grounds. The question stated as follows: ***“Where are vending machines available to students on the school ground?”*** Sixty-nine respondents (43%) reported that there are no vending machines for students and the same percentage of the participants agreed that the vending machines are located in other indoor areas. Only forty-three participants (27%) reported that vending machines are located in foodservice areas where meals are served/ eaten. The last

question stated *“Who decided to place the vending machines that are available to students outside of the foodservice area?”*

Figure 2. Illustrates personnel that are in charge of school vending machines.

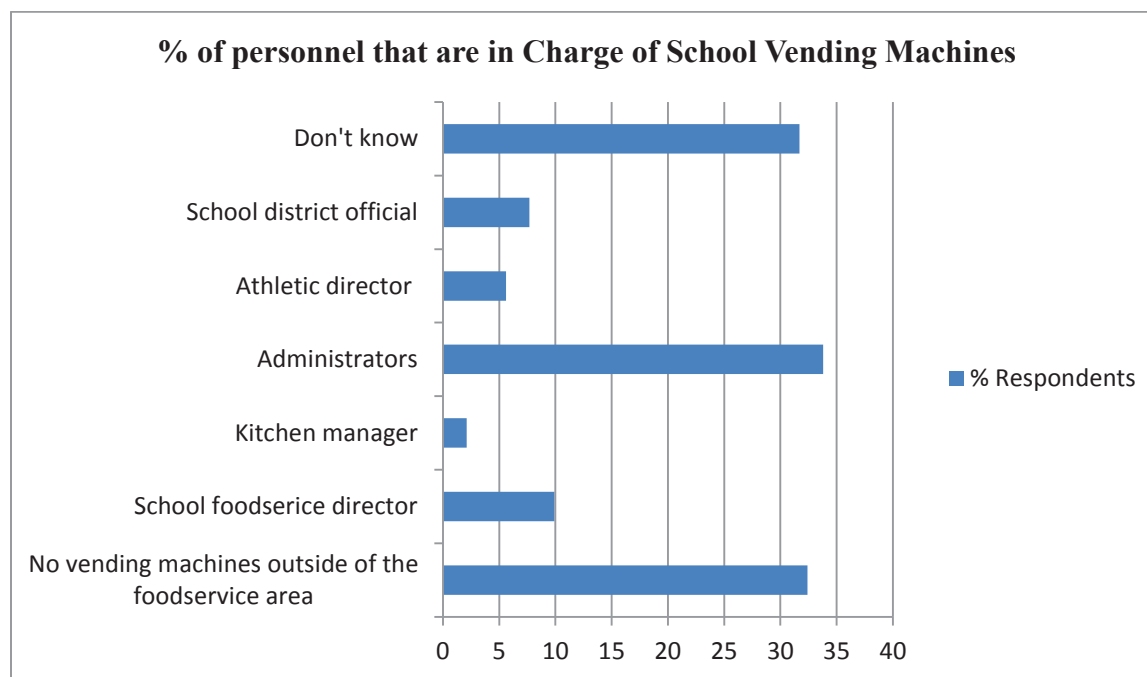


Table.9. School foodservice directors’ comments regarding serving/offering healthy school meals.

Attitudes toward adding healthier food choices to school meals

“There is a need/requirement to have high participation rates which drives not making a switch to healthier foods.”

“It would require us to make room for our products and be able to store the items. Time to prepare the healthier foods.”

“New meal pattern is overly restrictive and totally inflexible”

“I know that if we serve healthier food our lunch count is way down, they want processed foods.”

“We have offered healthier choices and they don’t take it and the food goes bad.”

“Concerned that kids do not want anything else-they want the fast food they buy at the local McDonalds-Runza, etc.”

“Students don't like the taste of some healthier items. When we have

homemade white rolls we always have students ask for seconds, when whole wheat rolls are served there are many that are put in the garbage.”

“Staff is extremely busy and usually short staffed. It takes time to plan and implement new menu items.”

“Student acceptability is our main concern. Especially, when LA tried to change their menus and student acceptance was low.”

“More waste if students are "required" to take healthier items.”

“You can't force students to eat anything!!! Obesity does NOT start in school.”

“We add no extra salt to anything, and fix foods lower in fat with school meal requirements I feel schools have been doing this for years, and I'm tired of school lunches being blamed for students obesity. I feel it all starts at home.”

Barriers prevent schools from purchasing foods lower in fat and sodium

“Food Service suppliers do not offer good selection that meet NSLP guidelines.”

“The fact that the low sodium foods have NO flavor.”

“The prepared food companies we receive food from hasn't had time to meet the requirements for the changes.”

“Lack of healthier food items available at the distribution warehouse.”

“We can only purchase items on an "approved" list.”

“Availability of lower fat lower sodium items.”

“Have had trouble with vendors keeping the product in once we get one we like.”

“Commodity program needs to add choices that are lower in fat and sodium.”

“Often there just isn't enough choices out there.”

“Lack of offering from commodities or supplier.”

“Lack of items available. and usually lower fat means product has more sodium availability of product.”

“Sometimes vendors don't have such items- this is improving.”

“Can't get them all the time, they are special orders.”

“Lack in taste that students are use to. Tasteless!”

“We try to, but school thinks it cost more.”

“Lack of pre-made items that are available to purchase.”

Barriers prevent schools from preparing foods

“Participants drives choices.”

“We do not write our own menu.”

lower in fat and sodium

“Lack of availability of lower fat lower sodium items.”

“Another thing is the food products are very costly and so we have to watch that very closely so we “stay within our budget.”
“time to pre prepare”

“A lot of premade foods come high sodium.”
“We try to, but school thinks it cost more.”

“Lack of items that are available.”
“Hard to find items to use.”

Practices in promoting healthy menus

“We are too busy trying to cover everything else that needs to be done,”
“none, not in management position”

“We have talked to students about my plate and eating healthier so we can all feel better and live longer.”

“I plan to put a letter in the newsletter at the end of school to let parents & students know about the changes in the lunch program.”

“None Correctional setting. We help educate on the serving line but hard to do on a continue basis”

“Usually youth ask us questions or what a better choice would be between two items being served.”

“Started to introduce low fat salad dressings, use 1% white milk and skim chocolate milk. Our second entree choice is a sandwich on wheat bread with turkey and cheese. We used to offer desert twice a week or more, now we have it once a week if at all. All of our bread, buns etc. are at least 57% whole wheat, which we have been doing for at least the last 2 years.”

Knowledge:

Four questions were developed to assess the participants’ knowledge about whole grain products. The first question asked the participants to indicate whether most children are eating enough servings of whole grain food each day in their schools. Ninety-four respondents (56.6%) agreed that most children in their schools consume enough of whole grain items versus seventy-two respondents (43%) disagree about the statement above regarding consumption of whole grains in their schools. The second question stated as follows: **“A product must contain 16 grams of whole grain flour to be whole grain.”** Eighty-two participants (55.8%) agreed with

the right answer versus sixty-five participants (44%) disagreed with the statement above. The third question stated that *“After processing, the difference between whole grain and enriched, refined flour is that whole grain contains the bran and germ and refined flour does not.”* The majority (86%) of the respondents agreed with the statement which was the right answer for the question. Only twenty-two participants (14%) disagreed with the statement that whole grain contains the bran and germ and refined flour does not after processing the grain. And the final knowledge question asked the participants regarding the label requirements to determine whole grain products. The question was stated as follows: *“All labels are required to include information to determine the amount of whole grain per serving.”* One hundred and one participants (63.8%) agreed with the statement which is the right answer for the question whereas fifty-eight participants (36%) disagreed with the statement above.

Trainings:

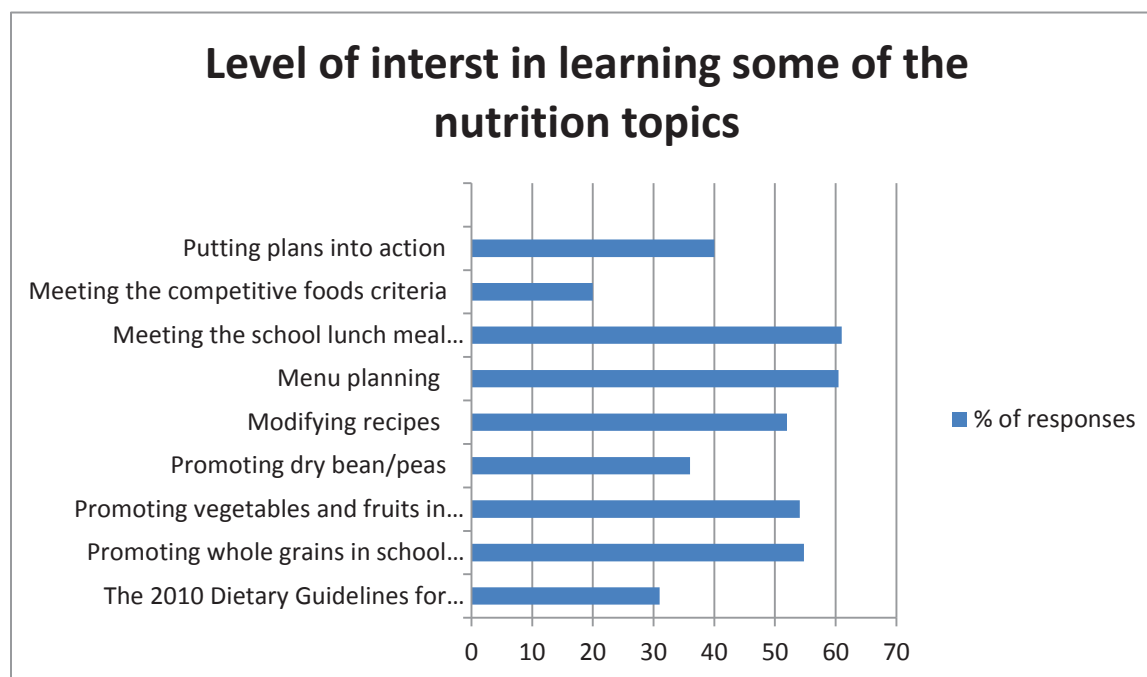
The survey looked for professional development opportunities for the school foodservice staff through one of the questions. Participants were asked to select the number of professional development opportunities related to nutrition and foodservice that they receive every year. Seventy-seven participants (48%) reported that they receive between one to two (1-2) opportunities per year, twenty-eight (17%) receive three (3) or more per year and twenty-four participants (15%) have more than five (5) opportunities per year. Only twenty-nine participants (18%) do not receive any professional development opportunities related to nutrition and foodservice field.

The survey solicited the participants' interest in receiving nutrition education opportunities. Participants' selected different nutritional topics that were listed based on their

interest level. The majority (61%) of the participants expressed their interest in learning about *“meeting the school lunch meal pattern requirements,”* ninety-five participants (60%) selected *“menu planning,”* eighty-six participants (54%) checked *“promoting whole grains in school meals,”* eighty-five participants (54%) would like to learn about how to *promote fruits and vegetables in school meals,* sixty-three participants (40%) selected *“putting plans into action,”* and fifty-two participants (36%), forty-nine participants (31%) and thirty-two participants (20%), respectively selected the following: *“promoting dry beans/peas,” “the 2010 dietary guidelines for Americans,”* and *“meeting the competitive foods criteria”*, respectively.

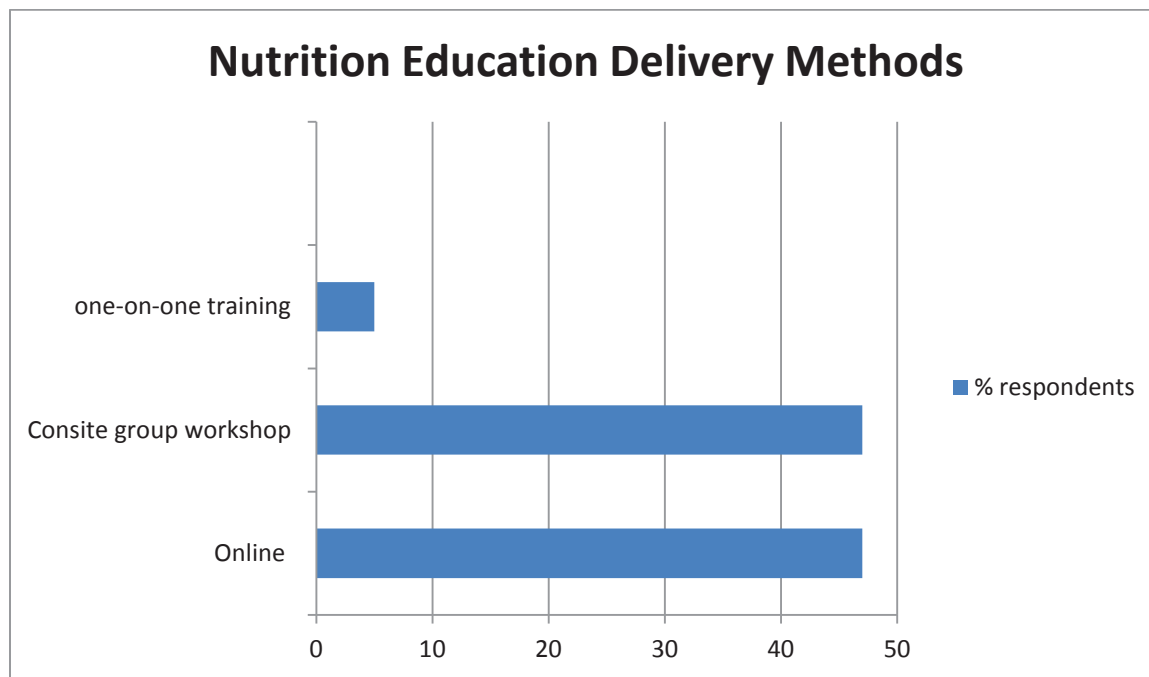
Figure 3. Shows the distribution of the participants based on their interest level on each listed nutritional topics.

Question 26. What type(s) of program topics would you be most interested in?



Finally, preferred nutrition education delivery methods were assessed by the on-line survey. Participants’ responses indicate that they prefer online methods (e.g., webinars, videos)

and onsite group workshop equally seventy-six (47%) each. Only eight participants (5%) preferred “one-on-one training” method.



Phase II:

Participants Profile:

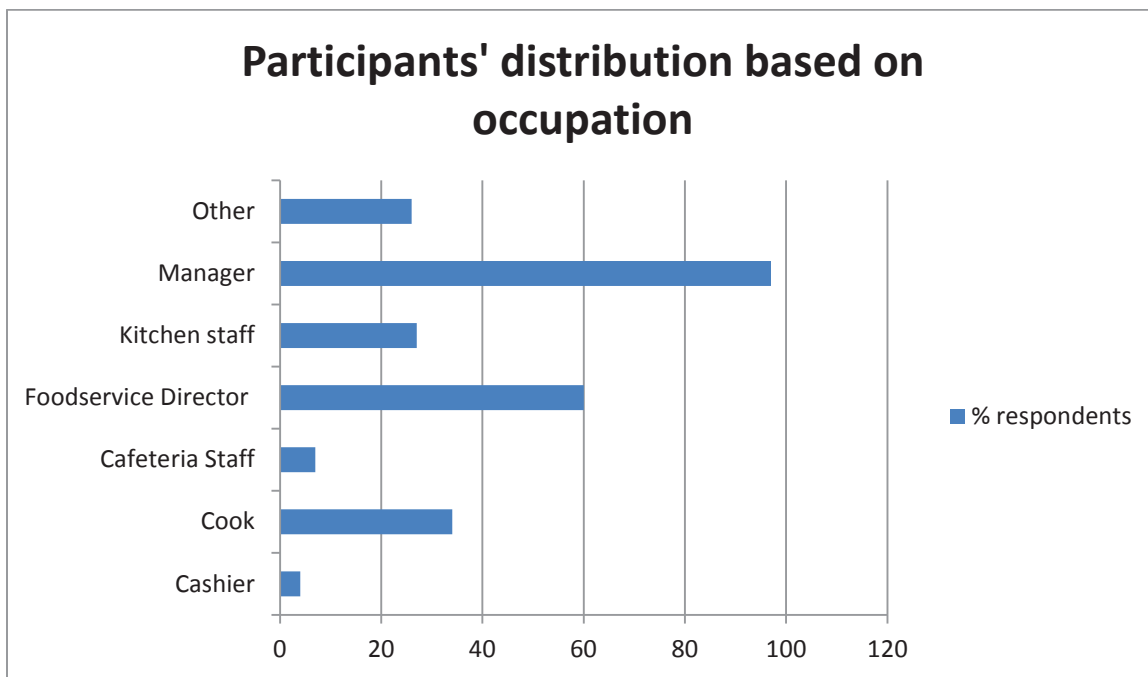
Thirteen questions were developed for the second phase of the quantitative method. The developed questions were based on the health belief model to assess the participants' attitudes, practices, and the level of self-efficacy toward serving healthy meals in their schools.

Additionally, two questions target participant's demographic information and are included in the survey as well (**Appendix C**). All the data was collected and used quantitatively.

The survey was conducted in the forms of paper copies at the trainings to reach a diverse group of audiences who work in school foodservice settings. The purpose of developing and conducting this survey was 1) to supplement the online survey to assess the participant's knowledge, attitude, and practices in serving healthy school meals, 2) to reach more school foodservice personnel since the online survey was sent to only school foodservice directors and 3) the online survey knowledge questions covered only whole grains.

The survey was administered to two hundred and sixty (n=260) participants at the following locations: Lincoln, Omaha, Kearney, Grand Island, Norfolk, North Platte, and Scottsbluff. The participants of this phase consisted of four (n=4) cashiers, thirty-four (n=34) cooks, seven (n=7) cafeteria staff, sixty (n=60) foodservice directors, twenty-seven (n=27) kitchen staff, ninety-seven (n=97) managers, and twenty-six (n=26) others which included superintendents, principals, dietitians, school secretaries, and book keepers.

Figure 5. Shows the distribution of the participants based on their occupation.



The majority (n=150) of the participants worked at the district level grades K-12, whereas the rest of the participants worked at Elementary, Middle/Junior high schools, and High school levels as follows: 62, 13, and 31, respectively.

The survey also looked for amount of time that each participant spent at their job on a daily basis on menu planning, purchasing food items, food preparation, cooking, serving, documentation, and cleaning up/dish washing (Table.10). In regards to the amount of time that spent on a daily basis on menu planning, half (n=131) of the participants spend less than an hour, 22% spend 2-4 hours/day, and 5% spend 5-6 hours/day. Moreover, the amount of time spent daily on purchasing food items was reported as follows: 60% spend less than an hour/day, 19% spend 2-4 hours/day and less than 3% spend 5-6 hours/day. Food preparation seems to be taking most of the participant's time every day. One hundred and forty-two (54.5%) participants spend

2-4 hours/day on food preparation whereas thirty-seven (14%) participants reported that they spend 5-6 hours/day and forty-two (16%) participants spend less than an hour/day on food preparation. The time spent daily on cooking was also reported as follows: forty-seven (18%) spend less than an hour/day, one hundred and forty-six (56%) spend 2-4 hours/day, and thirty-two (12%) participants spend 5-6 hours/day on cooking school menus. Participants were asked to report the amount spent on serving school menus on a daily basis. Respondents indicated that approximately 43% spend less than an hour/day, 44.6% spend 2-4 hours/day and only 1.2% spends 5-6 hours/day on serving school menus every day. Documentation, which includes reporting production records, HACCP process, and other reports that are required for meal reimbursement, was also taken into consideration to count toward the amount of time spent on a daily basis. The majority (n=145) of the participants spend less than an hour daily, 64 participants spend 2-4 hour/day, 9 participants spend 5-6 hours/day, and only two participants spend 7-8 hours/day on documentation. And finally, cleaning up/dish washing was also counted toward the amount of time spent on a daily basis in serving school meals. Ninety-five (36.5%) participants spend less than an hour/day, one hundred twenty-seven (48.8%) spend 2-4 hours/day, and six (2.3%) participants spend 7-8 hours/day on cleaning up/dish washing every day. Table 10. Displays these results.

Table 10. Result of the distribution of time spent on a daily basis (n=260)

Categories	< 1 hour	2-4 hours	5-6 hours	7-8 hours	> 8 hours
Menu planning	131 (50%)	58 (22%)	13 (5%)	2 (.8%)	1 (.5%)
Purchasing food items	157 (60%)	50 (19%)	7 (2.7%)	0 (0%)	0 (0%)
Food preparation	42 (16%)	142 (54.5%)	37 (14%)	4 (1.5%)	1 (.5%)
Cooking	47 (18%)	146 (56%)	32 (12%)	4 (1.5%)	1 (.5%)
Serving	111 (42.7%)	116 (44.6%)	3 (1.2%)	0 (0%)	0 (0%)
Documentation	145 (55.8%)	64 (24.6%)	9 (3.5%)	2 (.8%)	0 (0%)
Cleaning up/dish washing	95 (36.5%)	127 (48.8%)	6 (2.3%)	1 (.5%)	0 (0%)

Attitude

The survey assessed the participants' attitudes toward children food intake. Questions were provided with a statement regarding children food consumption. Participants had four options to select to reflect their level of agreement with each statement. The options were as follows: (4) strongly agree, (3) agree, (2) disagree and (1) strongly disagree with each statement. (Table 7)

The first statement stated that "Children who eat low-fat foods at school will be healthier than children who do not eat low-fat foods at school." Approximately eighty-two percent (n=213) participants agreed and strongly agreed that children who eat low-fat foods at school will be healthier than children who do not eat low-fat foods at school. On the other hand, only seventeen percent (n=44) disagreed/strongly disagreed with the statement above.

The participants were also provided with the following statement "Children who eat low-sodium foods at school will be healthier than children who do not eat low-sodium foods at school." The

majority of the respondents (n=201) had a high level of agreement which was between “agree” and “strongly agree” with the statement that children who eat low-sodium foods at school will be healthier than children who do not eat low-sodium foods at school. Only fifty-six (21%) participants disagreed/strongly disagreed with the statement regarding the children and their low-sodium foods consumption.

The third statement stated: “Children who eat fruits and vegetables at school will be healthier than children who do not eat fruits and vegetables at school.” Again, the participants had a very high level of agreement (n=227 of 260) with consumption of fruits and vegetables among children whereas twenty –nine (11%) disagreed/strongly disagreed with the above statement.

A statement regarding children’s whole grain foods consumption was included in the survey and it was stated as follows: “Children who eat whole grain foods at school will be healthier than children who do not eat whole grain foods at school.” Another high level of agreement (79%) that children who eat whole grain foods at school will be healthier than children who do not eat whole grain foods at school. Fifty-one (19%) had a very low level of agreement regarding the above statement.

Participants were provided with a statement regarding children’s weight status and its relationship with the health risks. The statement stated “Children who are overweight have more health risks than children who are normal weight.” Ninety-one percent (n=237) agreed/strongly agreed with the above statement and only seven percent (n=19) disagreed/strongly disagreed. The last statement under “attitude” category stated as follows: “What a child eats at home is more important to a child’s diet than what I serve at school.” While the majority of the respondents had a high level of agreement which was between “agree” and “strongly agree” with

all of the statements above, most of the participants had a very low level of agreement. Only two participants agreed/strongly agreed with the statement whereas, ninety-seven percent (n=252) disagreed/strongly disagreed that what a child eats at home is more important to a child's diet than what I (foodservice staff) serve at school. Participants' responses to the last statement raised a controversial argument for data interpretations. It is unclear whether the participants disagreed/strongly disagreed with the statement of "what a child eats at home is more important to a child's diet than what I serve at school" because of the job security or because of their attitude toward the parents who they believe do not offer/serve healthy food to their children.

Table.11. illustrates the frequencies of the respondents on each statement.

Table.11. Frequencies of the respondents on each statement (n=260)

Question	Strongly Disagree	Disagree	Agree	Strongly Agree
a. Children who eat low-fat foods at school will be healthier than children who do not eat low-fat foods at school.	1 (0.4%)	43 (16.5%)	173 (66.5%)	40 (15%)
b. Children who eat low-sodium foods at school will be healthier than children who do not eat low-sodium foods at school.	2 (0.8%)	54 (20.8%)	161 (62%)	40 (15%)
c. Children who eat fruits & vegetables at school will be healthier than children who do not eat fruits & vegetables at school.	2 (0.8%)	27 (10.4%)	160 (61.5%)	67 25.8%
d. Children who eat whole grain foods at school will be healthier than children who do not eat whole grain foods at school.	1 (0.4%)	50 (19%)	160 (61.5%)	46 (17.7%)
e. Children who are overweight have more health risks than children who are normal weight.	2 (0.8%)	17 (6.5%)	120 (46%)	117 (45%)
f. What a child eats at home is more important to a child's diet than what I serve at school.	73 (28%)	179 (68.8%)	1 (0.4%)	1 (0.4%)

Practices

The second survey added four questions, which were not included in the online survey, to assess nutrition practices related to following recipes, measuring with the right utensils, using fresh /frozen fruits and vegetables and whole grain items in their menus. Participants were provided with three options to select to determine their level of agreement with each question. The options were as follows (Table 11): (3) always, (2) sometimes, and (1) never. The first question stated: “Does your school follow recipes, measuring all ingredients with standardized measuring utensils?” The majority (68%) of the respondents indicate that participants “always” follow recipes, measuring all ingredients with standardized measuring utensils, whereas seventy-three (28%) of the participants reported that they “sometimes” follow recipes, measuring all ingredients with standardized measuring utensils. The survey also asked the participants to select their level of agreement regarding serving menu items with standardized serving utensils. The result of the second question of the survey shows that the majority of the participants (87%) always serve menu items with standardized serving utensils and only 10% reported that they “sometimes” serve menu items with standardized serving. Using fresh and/or frozen fruits and vegetables and whole grains were also assessed in this phase. One hundred and seventy-two (66%) participants reported “always” and eighty-four (32%) participants reported “sometimes” use fresh and/or frozen fruits and vegetables in their schools. Whereas eighty-six (33%) reported “always” and one hundred and sixty-six (63.8%) reported “sometimes” use whole grain items in their schools. Table 12. Shows the result of the participants’ practices toward serving/offering healthy school meals.

Table.12. Result of the participants practices toward serving/offering healthy meals (n=260)

Does your school.....	Never	Sometimes	Always
a. Follow recipes, measuring all ingredients with standardized measuring utensils?	1 (0.4%)	73 (28%)	179 (68%)
b. Serve menu items with standardized serving utensils?	1 (0.4%)	27 (10%)	226 (87%)
c. Use fresh and/or frozen fruits and vegetables?	0 (0%)	84 (32%)	172 (66%)
d. Use whole grain food items?	3 (1.2%)	166 (63.8%)	86 (33%)

Self-efficacy

The instrument of the second phase contained four questions that assessed the participants' level of self-efficacy (Table. 13). The participants were asked to report their level of self-efficacy regarding serving/offering whole grain, fresh fruits and vegetables, low-sodium foods and low-fat foods to their students. In regards to serving/offering whole grain items, eighty-six (33%) were "very sure" that they can offer/serve whole grain items to their students whereas, the majority (63.8%) of the participants felt "a little sure" about their abilities of serving/offering whole grain items to their students. When the participants were asked to self-assess their level of self-efficacy related to serving/offering fresh fruits and vegetables to students, the majority of (n=163) participants were "very sure," eighty participants were "a little sure," and only eleven participants were "not sure" of their capabilities of serving/offering fresh fruits and vegetables to their students. In regards to offering/serving low-sodium foods in schools, 228 (87.7%) participants felt "very sure," 26 (10%) participants were "a little sure," and only one participant felt "not sure" of their capabilities of serving/offering low-sodium foods to their students. The final question regarding self-efficacy was about serving/offering low-fat

foods in schools. One hundred and fifteen (44%) participants were “very sure”, one hundred and twenty-four (47.7%) were “a little sure” and only fourteen (5.4%) participants were “not sure” of their abilities in offering/serving low-fat foods to their students. Table 13. Displays these results.

Table.13. Result of the participants self-efficacy level regarding serving/offering healthy meals (n=260)

Question	Not Sure	A little sure	Very sure
a. How sure are you that you can offer/serve whole grain items to your students?	3 (1.2%)	166 (63.8%)	86 (33%)
b. How sure are you that you can offer/serve fresh fruits and vegetables to your students?	11 (4.2%)	80 (30.8%)	163 (62%)
c. How sure are you that you can offer/serve low-sodium foods to your students?	1 (0.4%)	26 (10%)	228 (87.7%)
d. How sure are you that you can offer/serve low-fat foods to your students?	14 (5.4%)	124 (47.7%)	115 (44%)

Knowledge

Seven questions were developed to assess the participants’ knowledge related to food and nutrition. One of the questions was deleted from the results because it was based on the MyPyramid icon and transformed to “Choose My Plate” icon without any modification. The question stated: *“According to “Choose My Plate”, which food groups should provide the bulk of your diet?”* The participants were provided with four options and they responded as follows: a) meat/beans (13.5%), b) grains (17.3%), c) fruits (23%) and d) vegetables (45%). Participants were asked to identify food items that are classified as dark green vegetables. The large percent (63%) of the participants selected the correct answer. Whereas only 41% selected the right answer when the participants were asked to select food items that are considered whole grain. Participants also struggled with selecting the correct answer for dry beans and peas food

groups. Only 45% selected the green lima beans is a type of bean that is not classified as dry beans and peas. A large percent of the respondents selected the right answer for the last three knowledge questions. Eighty-five percent (n=222) chose the correct answer for the question that asked to identify the benefits of eating fruits and vegetables and using whole wheat pasta. Participants also did well with the question that asked about the health benefit of consuming dietary fiber. Seventy-three percent chose the correct answer for the question of “*Dietary fiber decreases the risk of which of the following problem?*” Moreover, a very large percent (91%) of the participants selected the correct answer for the question that asked about the typical American diet. Table 14 illustrates the distribution of the correct knowledge respondents based on the participants’ occupation.

Table 14. Distribution of the correct knowledge respondents based on the participants' occupation

Questions	Cashier (n=3)	Cook (n=31)	Cafeteria staff (n=6)	Director (n=58)	Kitchen staff (n=28)	Manager (n=98)	Other (n=27)
1	66%	64%	16%	81%	57%	63%	48%
2	33%	45%	16%	55%	28%	40%	44%
3	66%	51%	16%	55%	32%	43%	44%
4	66%	77%	83%	91%	82%	88.8%	81%
5	66%	64%	50%	83%	71%	72%	89%
6	100%	87%	83%	98%	89%	93%	89%

Relationship between knowledge, attitude, and self-efficacy with practice

In regards to the relationship between the level of foodservice staff knowledge, attitude, and self-efficacy with their practices of offering/serving healthy school meals, correlation and multiple regression analyses were conducted. Table 15. Summarizes the multiple regression model with attitude, self-efficacy and knowledge predictors. As can be seen in Table 15, the relationship between foodservice staff practices of offering/serving healthy school meals and their self-efficacy was positive and significantly predicted practices scores, $\beta = .237$, $P < 0.01$. This indicates that one untie SD change in school foodservice staff self-efficacy, a predicated change increases by .237 of practices of offering/serving healthy school meals, holding attitude, knowledge and occupation constant. No relationship was found between attitude and knowledge

of foodservice personnel with their practices of offering/serving healthy school meals, predicting attitude with practices and knowledge with practices of ($\beta = .109$ and p value= .081), ($\beta = .077$ and p value= 0.227), respectively. Occupation of foodservice staff was included as a predication in the multiple regression model to eliminate the autocorrelation problems.

Table 15. Coefficients of the occupations based on their self-efficacy, attitudes and knowledge

Model	Unstandardized		Standardized		
	Coefficients		Coefficients		
	B	Std. Error	Beta	t-test	Sig.
Attitudes	-.047	.027	-.109	-1.752	.081
Self-efficacy	.166	.043	.237	3.835	.000*
Knowledge	.061	.050	.077	1.212	.227
Cashier	-.615	.633	-.061	-.971	.333
Cook	.043	.241	.013	.180	.857
Cafeteria staff	1.236	.467	.172	2.646	.009*
Director	.249	.248	.072	1.004	.316
Kitchen staff	.321	.179	.142	1.792	.074
Manager	-.176	.263	-.046	-.668	.505

*Coefficient is significant at the 0.05 level.

Correlations between the knowledge, practices, self-efficacy and attitude of foodservice personnel was conducted to answer the research questions regarding the relationship between the attitude, self-efficacy and knowledge and with the practices of foodservice personnel of offering/serving healthy school meals. Table 16, it summarizes the correlations of independent

variables (attitude, self-efficacy and knowledge) with the dependent variable (practices). The result indicates that there is a positive correlation $r (.237)$, $p < .01$ between the foodservice staff's self-efficacy and their practices of offering/serving healthy school meals. Additionally, attitude and knowledge related to nutrition and food were statistically correlated, $r (.105)$, $p < .05$.

Moreover, a correlation between attitude and offering/serving healthy school meals was found, $r (.103)$, $p < .05$. No correlation found between knowledge and practices and knowledge and self-efficacy.

Table 16. Correlations between knowledge, practices, self-efficacy and attitude of foodservice personnel.

	Knowledge	Practices	Self-efficacy	Attitudes
Knowledge				
Correlation	1			
Sig. (1-tailed)				
Practices				
Correlation	.062	1		
Sig. (1-tailed)	.163			
self-efficacy				
Correlation	.034	.237**	1	
Sig. (1-tailed)	.294	.00016		
Attitudes				
Correlation	.105*	-.103*	.069	1
Sig. (1-tailed)	.047	.050	.135	

*Correlation is significant at the 0.05 level (1-tailed).

** Correlation is significant at the 0.01 level (1-tailed).

Phase III:

Participants Profile:

A purposeful sample of school foodservice personnel from Nebraska was used. Fifteen (n=15) school foodservice personnel were recruited from fifteen different school districts that represented 7,980 students enrolled in NE schools. Two focus group sessions were conducted at the Nebraska School Nutrition Association Annual Conference in Kearney, NE. Ten (n=10) of the recruited participants were school foodservice managers, two (n=2) directors, and three (n=3) head cooks. The geographic location of the school districts that were represented by the participants included the following: Scottsbluff, North Platte, Kearney, Norfolk, York, Wauneta, Wilber, Boyd, Columbus, Hartington, Wilcox, Pender, Litchfield, WestPoint, and Boone. The participants' experience levels ranged from less than three years to more than thirty-five years in school foodservice.

Each session lasted fifty minutes in length. Each participant received a \$25 gift card for participating in the focus group. Both sessions were transcribed by hand and four themes emerged from the two sessions. The four themes are attitude, barriers, practices, and training.

“Attitude”

Participants not only described their attitude towards childhood obesity but they also shared the attitudes of parents, students, and teachers towards eating healthy food. At the beginning they were asked to share their view of childhood obesity and the seriousness of it in NE. It was very interesting how the two groups had different views of the seriousness of childhood obesity. The first group with low experience level described it as a serious problem in the US. One participant remarked, *“I think it is serious; I mean if you actually look around and*

you can pick up or see at least one kid in every class that is overweight.” The second group with the higher experience level viewed it as not serious and suggested changing the term obesity to overweight. One participant said, *“The word obese is scary; I like the overweight better.”* Another participant remarked, *“When you think of obese you think of some 300 lb guy lying on the couch eating and watching TV.”* A participant said, *“They call someone obese I don’t think they are obese I would call them overweight instead. Choosing the term obese is very harsh and scary and I don’t think we have that problem but I just think we have a little more meat on the bones here and in the Midwest than what you see in the city because of the activities that our kids the lifestyle difference of our kids.”*

Both groups had the same opinion that parents are the first to be blamed for the cause of childhood obesity. The majority of the participants point the finger at the parent’s busy lifestyle and lack of knowledge. One participant said, *“Well parents are first to start with – they are not active, they are busy with their own jobs, and I just think they push for bad food choices. They aren’t filling their house with proper food and they are rewarding their children with food.”* Another participant said, *“but the thing is when the kids go home they should be able to go you know a fresh cooked homemade nutritious vegetable and most of the kids don’t because there is lack of time or their parents is lazy they don’t understand and they don’t know that.”*

The participants also described students’ food choices and physical activity level. They believe that early elementary students are willing to try fruits and vegetables but by middle school their food preferences change negatively. A participant added, *“You get to about fifth grade right when they are starting to say I don’t want to eat fruit anymore I don’t eat vegetable anymore but you get those little kids third or fourth grade they will come back for fruit 2 or 3 times if they try it first.”* Another participant said *“We have an open campus where students go*

to the convenience store and what they pick junk food of course.” It was also said by a participant, *“Where I work when I see middle school the line of cars before and after school that didn’t happen when I was in school we walked to and from school no matter where you lived and now we don’t see the kids walking to and from school or even riding their bicycles.”* One participant commented, *“A lot of the little kids when we make casserole they say oh I don’t like it and I think because it’s never introduced by parents.”*

Both groups also agreed that teachers not only have responsibility towards educating students about proper nutrition but also have influence on the food choices of the students. The participants would like to see the teachers promoting school lunch, sitting and interacting with the children during lunchtime, and setting a good example. *“We have a job too and their job really is to be a teacher they need to be on our page with us they have to be part of the classroom,”* said a participant. Another participant added, *“I think their job is just as important as ours.”* *“We have some teachers go through lunch line and complain about food in front of other kids,”* said an additional participant.

“Barriers”

Participants identified many barriers during both sessions. The main barriers they listed were time and support. Regarding time they mentioned how lunchtime is very short especially for little students because there is no time to sit, chew, eat, and enjoy their lunch. *“Additionally they mentioned how recess is scheduled after lunch so consequently the students hurry to eat their lunch so they can get more recess time. One participant remarked, “I think the younger kids take more time. I think like, in my school I think they need at least five to ten minutes more than what they are getting now because it’s just like right at the end it’s rush, rush, rush, hurry up,*

you know. You eat your food because the next one is going to come in and it's just, you know, they are younger. They are smaller. It just takes some more time to eat smaller bites, you know."

Another participant shared the following comment regarding lunch hour: *"They'd go out and eat something and have them delivered back to the school and probably back. No one has ever got back and we just don't have time and probably a long story."*

Other participants said, *"that's why they always out of time they're going to grasp what's easy because we're trying to push them to go fast through the line. We try to make it so if they can get through us as fast as they can. They don't want... I mean it's their time too. They want to get through."*

Lack of time to attend or participate in continuing education opportunities was mentioned by the participants; one participant commented, *"Some people maybe don't want to take it out of their summer vacation. I mean some schools would rather have it during the school year so they get paid for it and they go and I know that. But then there are some that would like summer but some better do on the summer feeding programs too are having a hard time getting away too."*

Another participant said, *"because we have no time to pull those. Yeah, you can't and because you can't pay them overtime, you know, have them come in. I have my managers' meetings. I have about four or five of those a year but..."*

Additionally, the load of paperwork which consumes most of their time and responsibilities which prevent them from preparing food from scratch and that's why they are forced to use more ready-to-eat, convenience foods. The following comments were made by a couple of the participants:

“When we are short staffed, which is almost every day - don't have time to do.”

“That’s why most of the cooks use more ready-to-eat food, because it is very convenient, fast and easy.”

The participants also expressed their need of getting the full support of school administration and teachers in order to promote the new meal pattern and healthy eating habits. One participant remarked, *“I’d like to go beyond the parents because I want the teachers to know also so they can prepare the students when they come out (new meal pattern). In the classroom, teachers can ask the students about their lunch and if they hear something negative they can back us up because we support them. They need to support us.”* In regards to teaching healthy eating habits a participant suggested that the health teachers need to be involved. *“And I don’t think it can only be us. I think the health teachers have to be really engaged.”* Another participant also shared regarding this subject matter, *“Teachers are trying with one grade and not going further to continue presenting it. I really believe it’s the teacher’s job but the teachers say it’s not in their contract.”*

Participants conveyed they don’t feel comfortable relaying the information to the administration and teachers because of their education level and job title. Hence the administrators prefer to hear it from higher level sources. A participant illustrated this point by saying, *“They don’t communicate with us because they think it’s just us. If they heard it from a higher authority then they would know, believe us, and maybe trust and listen to us more.”*

The schools need the support of the parents so that the same message is consistent between home and school. A participant said, *“I think a family’s income is huge on it. The lower income families can’t afford to do organized sports and extracurricular activities and it’s cheaper for*

them to eat at McDonalds than at home.” Some of the participants shared that some parents take advantage of the fact that their children eat two out of the three meals at school and they know they are getting nutrients there they become dependent on the school to meet their child’s nutrition needs; this leads the parents to put dinner time as a low priority. A participant said, *“I have a mother at my school who told me that she doesn’t cook at night because she knows her kids get two meals a day at school. She should take the responsibility to feed him the third time.”*

Support from the NE Department of Education was one of the barriers they mentioned; they would like to receive more training, technical assistance, and nutrition resources. Specifically, one participant mentioned, *“We would like to have laminated posters that are ready to go because we don’t have time we’re busy doing our job and we are not a computer.”* Another participant added that, *“We need more technical assistance from the Department of Ed.”*

“Practices”

Under this section participants shared their opinion about not only their own nutrition practices, but the practices of parents as well. The majority of the participants shared about what they’re currently doing in regard to promoting the new meal pattern; for example, some of them mentioned they already are purchasing more fruits and vegetables and others shared how they added more whole grain items to the school menus. A participant remarked; *“Part of our requirement was we had some vegetables, fruits, grains, and the protein, each selection so the kid can come through and select for their meal.”* The following comment was made by one of

the participants *“Ours (menu) is more focused on the healthy because I didn’t know really you could even offer cookies or sweet.”*

Some participants started to communicate and promote their new school meals that are aligned with the USDA new meal pattern to the parents and students. A participant shared the following comment: *“I really want to introduce a newsletter. I personally feel like as a professional I can do what we started to talk about. Things are going to change.”* Another participant added, *“I started to change the portion size of cookies to a smaller size and I told teachers and students that my supplier sent the wrong thing so they wouldn’t complain.”* One participant gave an example of how she verbally communicates healthier eating to her students by stating, *“I promote the vegetables through the line by saying guys this is really good, it’s fresh and steamed, and tell them not to forget their vegetables because they’re healthy.”*

Most of the participants agreed that one of the practices many parents engage in is using food as a reward. A couple of the participants stated, *“Parents reward their children with food and that it should be changed.”* Another practice that affects the students’ food preferences that was shared by the participants is the lack of family mealtime. A participant suggested, *“There is no sit down meals. There is no family time.”*

“Training”

Both groups voiced their opinions that there is a greater need for training and education regarding food safety, improved cooking skills, and child nutrition standards. Participants stressed their concerns regarding the current lack of training opportunities, resources, and support available not only to them but also to their staff, students, and teachers as well.

Training opportunities related to food and nutrition was the most common concern voiced from the participants. According to the participants' comments, the directors do not regularly receive adequate training related to food and nutrition and this greatly affects their confidence level in providing proper trainings to their own staff. They feel that they need to be trained and educated first in order to educate others. One director shared, *"Well I am unsure on what I've learned or then I don't want to teach her (staff) because then when they find out I'm wrong???"* Another participant remarked, *"We need a class that taught us how to talk to people about healthy school nutrition and all the changes."*

Many participants expressed their concern regarding food safety training for many reasons: 1) food safety training is not required for all the kitchen staff by the health department, 2) maintaining a certificate related to food safety is not included in school policy and 3) food safety training/workshops are not offered on a regular basis. One participant remarked, *"There is not enough training and education like for the staff. I think McDonalds employees and in any restaurant should be doing certain things like training for food safety and it is not written in our school policy."* Another participant added regarding food safety training, *"I think it's going to turn around. It's just a sense of time but for example, not everybody has to have Serve Safe and I think that's so important for anybody in the food department."*

Additionally, participants expressed their concern about new hires. Since there is no job description for the new employees therefore new hires don't come with adequate cooking skills. It was suggested that offering cooking classes for the new employee is very critical and essential. These types of classes, in participants' opinions, will increase the cooking skills for the new and existing employees. A participant said *"We need a cook training. You know managers were changed. We have so many new managers and it would be nice if there was a place to send for*

training.” Another participant added the following, “Probably to learn how to cut celery or probably cut up a watermelon or what’s an easy way of doing it.” Another participant said, “You know that would be really good for servers even like the cashiers. If there was some kind of workshop for the cashiers, how important their job really is. It is not just standing and giving tickets.”

Another suggestion was made by the participants to have trainings or workshops available to teachers, parents, and students when there are major changes that impact child nutrition. The following comments were made by several participants regarding the need of educating teachers, parents, and students:

- *“Health is taken away from the classes. Health classes are not taught regularly. We need to get more health and physical education for our kids.”*
- *“Our students need to hear about health from somewhere.”*
- *“But I think it needs to be like classroom. You need to learn about health in a classroom setting.”*
- *“We don’t have a nurse or a dietitian, and our PE teachers don’t talk about healthy food and all that.”*
- *“If the kids were educated about what a body needs for calorie intake a day and if they really wanted to be fit or whatever they would bypass that junk food because if they knew my plate... and knew this is what we have to have in my plate, these are the maximum calories and they really should have to maintain their weight I think it was brought to their attention, they would not overeat or pick those things because that’s their choice but I think majority of just knowing... like, my kids they have learned to read labels and like, “Oh how many calories in this thing?”*

because I've taught them. You know look at this. I think it's just back to educating the parents and the kids."

Participants voiced suggestions for future trainings and workshops relating to food and nutrition. Several participants suggested providing a one week course that is designed for school nutrition. One of the participants remarked, *"we would like from the department of Education to offer like NTENT (Nebraska Training Education Nutrition Teams) class to understand the importance of healthy eating habits; I think teachers need to hear all the school nutrition changes too."* Other participants expressed their interest of having Registered Dietitians, nurses, or staff from the extension to provide some educational lessons related to food and nutrition. Moreover, participants shared their preferred type of delivery method which was face to face or classroom workshops versus online webinars. This method gives them the chance to share and hear ideas from others in the same field, as well as more time to ask questions. In addition, they prefer this mode of learning because most of them aren't familiar with using the computers. A participant said *"We need a class to catch up on the things that have changes and new ideas, to get a group of people together and just throw these different ideas."* Another one added *"We learn so much from other people; even here there is not really time in a classroom to share different ideas all the time."* A participant remarked regarding using online resources, *"Some of the resources and forms are available online; well we got some people that are really scared of using computer. That computer thing wasn't here when we touched it for the first time, so now it comes out and we have to learn how to use it on top of all the work we have????"*

Participants also reinforced the idea that trainings shouldn't be available to just them but also to include other staff from their school districts. One participant said, *"I wish that even if like our districts will get all of our staff together and have some kind of educational training for*

them because I think they need it.” A similar comment was made by another participant regarding the need of offering training related to food and nutrition, “We need a little training and this is what you are going to take back to your own employees to train them. I definitely would like to see that happen.”

Some of the participants shared current obstacles that prevent their staff from attending trainings related to food and nutrition. A participant remarked, *“My school district before I became the director there did not require people to go to attend trainings. I am now requiring that when I hire a new manager I tell them that “I want you to go to this class.” But I have five or six managers who come to conference every year and about 14 managers who don’t care about the certification or coming to classes and I don’t know how to handle this?”* Another participant added, *“I don’t know how to get them excited about it (training). I took kind of like my right hand man with me to a district meeting and she was bored. She was upset because she had to sit there for that long and I am like, “Come on, you’re supposed to be on my team, you know. Get with it. Get involved in this.”* Another participants said, *“In order for my staff attend trainings, they are expecting to be paid overtime and we can’t pay them overtime so they don’t come.”*

Mixed Method Results:

The mixing of the quantitative results from phase I (online survey) and phase II (paper survey) with the qualitative results from phase III (focus groups) produced some relevant findings and served well to answer the mixed methods question of the study, *how does nutrition related knowledge of foodservice personnel affect their beliefs and current practices in relation to providing healthy foods in schools?* After completion of the analysis of three sets of data, results were merged together. Data from both surveys identified foodservice personals attitude and practices toward offering/serving healthy meal options to their schools and data from the qualitative methods support these findings from the quantitative data. Moreover, data from phase I and II identified some barriers that face foodservice personnel in serving/offering healthy food items which also aligned with themes extracted from the phase III (focus groups). Quotes also were found to reflect the data collected from the quantitative methods regarding the foodservice personnel knowledge related to food and nutrition. Table 17 highlights some of these results.

Table 17: Result from merging data from phase I and II with phase III

Method	Quantitative	Qualitative
Method → Category ↓		
Attitude “toward students eating habits”	62%	“The belief that students won't choose healthier items.” “Our kids don't eat the vegetables we serve now!”
Barriers “students food preferences”	57%	“The kids complain about the bland taste.” “Most students are used to eating "junk" food. It is hard to get them to eat right or even to try new and different food.”
Practices “use fresh fruits and vegetables in school menu”	66%	“I order fresh oranges and apples and fresh baby carrots weekly. When ordering canned fruit, I order I order canned in juice.” “We now use Romaine lettuce, instead of iceberg.”
Knowledge “selected the correct answer regarding whole grain items”	41%	“I think we need a better education at district meetings” “For some people it is difficult to read. I don't know if it is the way I get it in my type but does anybody agree the way those things, emails are set up they are very complicated, the type”

CHAPTER V

DISCUSSION

The purpose of this statewide study was to address the nutrition knowledge, attitudes, and perceptions of school foodservice personnel in Nebraska regarding offering/serving healthy school meals. Moreover, this study identified some potential barriers and avenues of action for decreasing likelihood of preventable diseases such as childhood obesity, cardiovascular diseases, hypertension, high blood cholesterol and type II diabetes in general and offering/serving healthy school meals specifically. A convergent parallel mixed methods design was used, and it is a type of design in which qualitative and quantitative data were collected in parallel, analyzed separately, and then merged. The use of literature contains very limited research on the knowledge, practices, barriers, attitude, and self-efficacy of school foodservice personnel. Hence, this study is one of the first efforts to utilize a mixed method approach to address the previous mentioned factors. The study was guided by the following mixed method approach research question: *How does nutrition related knowledge of school foodservice personnel affect their beliefs and current practices in relation to providing healthy foods in schools?* Utilizing a mixed method approach produced some relevant findings which will allow many individuals to potentially value the data of this study. School administrators could benefit from the findings of this study to 1) address the barriers that were identified by school foodservice personnel, 2) evaluate school wellness policies, 3) establish partnerships with communities and universities for intervention, and 4) provide professional development opportunities for school foodservice personnel. Additionally, data of this study might benefit the Child Nutrition State agencies to 1) establish educational standards related to nutrition for the school foodservice managers/staff, 2) develop and formulate proper trainings and workshops for the new school foodservice

employees, 3) offer continual education opportunities for the existing school foodservice personnel, and 4) provide evidence of the importance of receiving the Team Nutrition Grant funds and other grant opportunities that target school foodservice personnel. Finally, the findings of the study will allow for tailored educational intervention efforts that will overcome some of the barriers that were identified in this study. The suggested intervention might target school foodservice personnel, teachers, students, and their parents.

The first two phases of the study addressed the central question quantitatively, *what are foodservice personnel attitudes toward serving healthy school meals?* The third phase addressed the central question qualitatively, *how do food service personnel describe their attitudes toward childhood obesity in schools in Nebraska?* Four sub-questions were established in order to answer the central quantitative research question and three sub-questions were developed to answer the qualitative central research.

Relationship between SFP attitude and their practices

The first quantitative research sub-question asked about the relationship between school foodservice personnel attitude and offering healthy school meals. Data obtained from this study indicates that there is a positive correlation ($r = .103, p < .05$) between foodservice personnel attitude and offering healthy school meals. This explains why the majority of participants had a very high level of agreement with the fact that children who eat low-fat food items, low-sodium food items, and many fruits and vegetables at school will be healthier than children who do not eat low-fat foods at school. Although SFP had a positive attitude toward offering/serving healthy school meals, they still voiced their concerns regarding teachers, students and their parents' attitudes toward offering/serving healthy school meals through the third phase of the study. Participants reported that some of the teachers go through lunch line and complain about

school food in front of the students. Participants also believe that lack of nutrition knowledge of the parents has a negative influence on the eating habits of the children. Bandura (1986) stated in his social learning theory that human behavior is transmitted significantly through exposure to role models. Teachers are held more accountable for kid's learning and they are classified as models by the students. Moreover, parental modeling of healthy eating and physical activity practices are critical and recommended by Ritchie et al., (2005) to reinforce children to eat healthfully and be physically active. Therefore, these behaviors that are practiced by the teachers and parents might have a negative effect on the eating habits of students.

Relationship between SFP self-efficacy and their practices

The second quantitative research sub-question asked about the relationship between school foodservice personnel self-efficacy and offering healthy school meals. Data of this study suggested that there is a positive correlation ($r = .237, p < .01$) between the foodservice staff's self-efficacy and their practices of offering/serving healthy school meals. Fortunately, the relationship between foodservice staff practices of offering/serving healthy school meals and their self-efficacy was positive and significantly predicted practices scores, $\beta = .237, P < 0.01$. This indicates that one untie SD change in school foodservice staff self-efficacy, a predicated change increases by .237 of practices of offering/serving healthy school meals. The concept of self-efficacy, which was introduced by Albert Bandura, refers to a person's confidence of his/her capacity to successfully perform a given task or behavior to manage prospective situations. The higher level of self-efficacy, according to Bandura (1982), affects employees' goal setting and performance positively. Data collected from the first phase (quantitative) and third phase (qualitative) support the finding in the second phase (quantitative). SFP shared many promising action plans toward making healthy school meals. Eighty-four percent of the

participants reported that draining fat from cooked meat was one of their strategies to reduce the amount of fat content in their menu. The same percentage of the participants agreed that using skim, low fat, or nonfat dry milk and using non-stick coating spray or pan liner were their other strategies to cut down the amount of fat content in their school menu. In regards to reducing sodium content in school menus, participants practiced the following strategies: 84% reduce the salt in recipes or eliminate it, 83% reduce or eliminate salt added to vegetables, 79.5% increase use of the fresh, frozen, and dried fruits, and 76.6% increase use of fresh, frozen, or unsalted canned vegetables and salads. Additionally, the majority of the participants shared about what they're currently doing in regard to promoting the new meal pattern; for example, some of them mentioned they already are purchasing more fruits and vegetables and others shared how they added more whole grain items to the school menus. A participant remarked, *"Part of our requirement was we had some vegetables, fruits, grains, and the protein, each selection so the kid can come through and select for their meal."* The following quotes were provided through the focus groups. *"I promote the vegetables through the line by saying guys this is really good, it's fresh and steamed, and tell them not to forget their vegetables because they're healthy."* and *"We have been decreasing the fat and sodium in our foods. But there is a point of 'no return' where the flavor isn't there."*

Relationship between SFP barriers and their practices

The third quantitative research sub- question identified some barriers that face school foodservice personnel in order to offer and serve healthy school meals. The majority of the participants agreed that the costs of the low-sodium and low-fat food items are the main barriers that prevent them from purchasing these food items. According to SNA's 2012 Back to School Trends Report; school nutrition programs are experiencing some challenges with the increased

costs in order to meet the new nutrition standards. The report indicates that school nutrition directors are expecting an increase in their programs' food costs for the 2012/13 school year as a result of redesigning their menus to include more whole grain, fruits and vegetables items. Additionally, they are anticipating an increase in labor costs, gas/transportation and indirect costs including electricity, gas and water.

Fifty-nine of the participants indicated that student food preferences is another barrier that prevents them from purchasing food items that are lower in sodium and fat. Additionally, participants reported that lack of availability of products that are a low in fat and sodium and at the same time are acceptable in terms of taste are factors that discourage foodservice personnel in purchasing these food items. The study also addressed some barriers that prevent them from offering/serving healthy meals in phase III that support the data collected in phase I and II. Moreover, participants added more barriers that were not mentioned in phase I and II. Lack of time and support suggested by foodservice personnel develop a vast barrier for SFP to make healthier school meals. Short lunchtime and recess schedules after lunch had a huge influence on student's lunch consumption. According to the participants report, students select food that is easy and fast to eat which usually doesn't include fruits and vegetables because of the lack of the time. A research study conducted by the National Food Services and Management Institute (NFSMI) indicates that the percentages of offered food eaten were significantly greater and the amount of offered food waste was significantly lower when recess was scheduled before lunch. Additionally, the amount of food eaten was significantly greater and the amount of food waste was significantly lower for the students who had a 30- minute lunch period versus 20 minutes (Bregman, Buerger, Enamuthu & Sanchez, 2000).

Lack of time was also an obstacle not for only students but also for the FSP. The load of paper work that is required by NSLP add more responsibilities on top of offering/serving school meals, which therefore prevent them from attending continuing education opportunities as well as from preparing food from scratch.

The finding of the present study also identifies lack of support as another barrier for foodservice personnel in trying to offer/serve healthy school meals. The findings suggested that there is an urgent need of a full school approach to promote and encourage healthy eating habits among students. At the same time the schools need the support of the parents so that the same message is consistent between home and school. Participants reported that teachers were not always considered approachable for discussing school meals. Future efforts are needed to improve the communication strategies between school administrators, teachers, foodservice staff, and parents in promoting healthy eating habits in school.

Relationship between SFP knowledge and their practices

The fourth research sub –question addressed the relationship between knowledge related to food and nutrition with practices of offering/serving healthy school meals. The question stated the subsequent: “*What is the relationship between the nutrition related knowledge of school foodservice personnel and their current practices in relation to providing healthy foods in schools?*” The results of the study did not find a relationship between knowledge of foodservice personnel with their practices of offering/serving healthy school meals, predicting knowledge with practices was ($\beta = .077$ and $p > 0.05$). Surprisingly, the findings of the study indicate that attitude and knowledge related to nutrition and food were significantly correlated, $r (.105)$, $p < .05$.

Although the participants were knowledgeable about the benefits of eating fruits, vegetables, and fiber; however, the majority of the participants struggled to identify whole grain items and dry beans items. Lack of knowledge about identifying whole grain items and dry beans/legumes indicates the urgent need of educating SFP on the basic food components. It is very important for the foodservice personnel to understand not only the general guidelines recommendation but also how to apply them to the school meals (Murphy, Sawyer, Hoerr, youatt, Byrd & Boyle, 1985).

The findings of the qualitative methods yielded information regarding the importance of receiving potential training opportunities related to food and nutrition in order to provide healthy school meals. Additionally, participants voiced their high level of interest in receiving trainings that improve the quality of their employees' performance, develop general leadership skills, and explore factors that motivate their employees. The findings of the present study concur with the finding of Sullivan, harper & West (2001) which indicates that school foodservice directors reported their interest in developing and implementing trainings and workshops that addressed the quality of school foodservice program, employee performance, and general leadership skills for their staff (Sullivan et al., 2001).

The Healthy, Hunger-Free Kids (HHFK) Act of 2010 establishes new nutrition standards for schools which require increasing the availability of fruits, vegetables, whole grains and fat free and low-fat fluid milk in school meals. Also, the final rules require reducing the levels of sodium, saturated fat, and trans fat in school meals, as well as meeting the nutrition needs of school children within their calorie requirements. However, according to the major barriers that were identified in this study, schools need to have the following;

- Proper pre-service and on job trainings for SFP to increase their confident level of meeting the new standards
- Adequate time to change menus and allow students to adapt to the new menu
- Additional funding and resources to purchase and prepare food low in fat, sodium and high in fruits, vegetables and whole grains
- Developing job descriptions that include qualification standards for the new SFP

LIMITATIONS

Regardless, the fact of the present study will fill a wide gap in literature regarding school foodservice personnel attitudes, knowledge, barriers, and practices of offering/serving healthy school meals; some limitations do exist that need to be taken into consideration and might provide opportunities for future research.

The first limitation stemmed from the fact that the primary researcher works with Nebraska Department of Education/Nutrition Services; consequently, participants only reported their positive practices. Hence, a small degree of over estimation may be suggested in regards to the participants' practices of offering/serving healthy school meals.

The online survey in phase one only targeted the directors of the school foodservice, which was the second limitation of the study. School foodservice directors usually receive more training opportunities and don't necessarily deal with serving and/or promoting healthy school meals. Therefore, the level of attitude, knowledge, and practices measured in phase I are not representative to all the SFP.

The third limitation was regarding the subjects in phase two of the study. The survey was conducted during the new meal pattern trainings that were held in summer 2012 and some of the participants were book keepers, cashiers, principals, and other staff who normally do not deal with offering/serving school meals. Hence, their answers to the survey questions did not represent the school foodservice practices.

There were multiple limitations in regards to the online survey and paper survey, which brings us to the fourth limitation of the study. The on-line survey contained questions that addressed practices, attitudes, and barriers that had many answers that participants could select;

hence it was not possible to utilize regression analysis for prediction. This explains why only frequencies and percentages were utilized to assess the variables in phase one. This error was corrected in the paper survey and added questions that addressed attitudes, practices, and self-efficacy and by selecting one option (strongly agree, agree, disagree, and strongly agree). Regression analysis was used in this phase; however, Cronbach's Alpha was measured to determine the level of reliability for questions were likely below the accepted cut-off of .7 because some of the scales had few items/options (Table 3). The other limitation regarding the paper survey was regarding question eight which was removed from the results. The question was designed based on the MyPyramid icon and directly transformed to My Plate icon without modification. The question stated that, "*According to "Choose My Plate," which food group should provide the bulk of your diet?*" The answer options were a) meat/beans, b) grains, c) fruits and d) vegetables. The responses to the question were 13.5%, 17%, 23%, and 45% for meat/beans, grains, fruits and vegetables respectively. The question misled the participants since the main message of My Plate is half of the plate should be fruits and vegetables and there was no option as "fruits and vegetables" together. At the same time, the word *bulk* was not defined clearly as to whether it meant the weight or volume. According to MyPyramid, grains provide the bulk of individual's diet.

Implications for future research

In light of the previous limitations regarding the surveys, there is a need for future studies that utilize a mixed methods approach and specifically use an exploratory sequential mixed method. The suggested method is designed to be conducted in two phases. The first phase will be a qualitative exploration of factors influencing offering/serving healthy school meals through

focus groups or semi structured interviews. The findings of the first phase will be used to develop survey questions to be utilized in the second phase of the study.

A follow-up study could be done using the current study as a starting point to develop educational interventions that target school foodservice personnel, teachers, students and their parents. Another follow-up study will be needed then to assess the effectiveness of these interventions in the previous study.

Interventions suggested to be developed that can address the barriers that were brought up by SFP, as well as provide professional development opportunities to address the lack of knowledge regarding food and nutrition which eventually impacts the future of the health of children being served.

Future research is needed to evaluate school wellness policies regarding healthy eating practices in schools. Moreover, establish partnerships with communities and universities for intervention that target students and their parents.

CONCLUSION

The purpose of this statewide study was to address the nutrition knowledge, attitudes, and perceptions of school foodservice personnel in Nebraska regarding offering/serving healthy school meals. Moreover, this study identified some potential barriers and avenues of action for childhood obesity prevention in general and offering/serving healthy school meals specifically. A convergent parallel mixed methods design was used, and it is a type of design in which qualitative and quantitative data were collected in parallel, analyzed separately, and then merged. Data collected from the first phase (quantitative) and third phase (qualitative) support the finding in the second phase (quantitative). SFP shared many promising action plans toward making healthy school meals.

Data obtained from this study indicates that there is a positive correlation ($r = .103, p < .05$) between foodservice personnel attitudes and offering healthy school meals. Although SFP had a positive attitude toward offering/serving healthy school meals, they still voiced their concerns regarding teachers, students and their parents' attitudes toward offering/serving healthy school meals through the third phase of the study.

Data from this study suggested that there is a positive correlation ($r = .237, p < .01$) between the foodservice staff's self-efficacy and their practices of offering/serving healthy school meals. Fortunately, the relationship between foodservice staff practices of offering/serving healthy school meals and their self-efficacy was positive and significantly predicted practices scores, $\beta = .237, P < 0.01$.

The majority of the participants agreed that the costs of the low-sodium and low-fat food items are the main barriers that prevent them from purchasing these food items. Additionally, participants reported that lack of availability of products that are a low in fat and sodium and at

the same time are acceptable in terms of taste are factors that discourage foodservice personnel in purchasing these food items. The study also addressed some barriers that prevent them from offering/serving healthy meals in phase III that support the data collected in phase I and II. Moreover, participants added more barriers that were not mentioned in phase I and II. Lack of time and support suggested which develops a vast barrier for SFP to make healthier school meals. Short lunchtime and recess schedules after lunch had a huge influence on student's lunch consumption. The load of paperwork that is required by NSLP adds more responsibilities on top of offering/serving school meal; therefore, this prevents them from attending continuing education opportunities as well as from preparing food from scratch.

The finding of the present study also identifies lack of support as another barrier that faces the foodservice personnel in offering/serving healthy school meals. The findings suggested that there is an urgent need of a full school approach to promote and encourage healthy eating habits among students.

The result of the study did not find a relationship between knowledge of foodservice personnel with their practices of offering/serving healthy school meals, predicting knowledge with practices was ($\beta = .077$ and $p > 0.05$). Surprisingly, the findings of the study indicate that attitude and knowledge related to nutrition and food were statistically correlated, $r (.105)$, $p < .05$.

The findings of the qualitative methods yielded information regarding the importance of receiving potential training opportunities related to food and nutrition in order to provide healthy school meals. Additionally, participants voiced their high level of interest in receiving trainings that improve the quality of their employee performances, develop general leadership skills, and explore factors that motivate their employees.

Interventions suggested that can address the barriers faced by SFP, as well as provide professional development opportunities to address lack of knowledge regarding food and nutrition that eventually impacts the future children's health being served.

Future research is needed to evaluate school wellness policies regarding healthy eating practices in schools. Moreover, establish partnerships with communities and universities for intervention that target students and their parents.

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APPENDIX A

IRB Letter of Approval (Survey)

June 11, 2012

Zainab Rida
Department of Nutrition and Health Sciences
6001 S. 74th st. Lincoln, NE 68516

Wanda Koszewski
Department of Nutrition and Health Sciences
119A LEV, UNL, 68583-0806

IRB Number:
Project ID: 12346
Project Title: School Food Environment and Childhood Obesity Prevention Pilot

Dear Zainab:

The Institutional Review Board for the Protection of Human Subjects has completed its review of the Request for Change in Protocol submitted to the IRB.

** The change request has been certified to implement a 13 question survey to the same population as previously recruited and also recruit participants at the Nebraska School Nutrition Association Annual conference.**

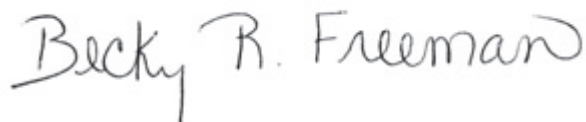
We wish to remind you that the principal investigator is responsible for reporting to this Board any of the following events within 48 hours of the event:

- * Any serious event (including on-site and off-site adverse events, injuries, side effects, deaths, or other problems) which in the opinion of the local investigator was unanticipated, involved risk to subjects or others, and was possibly related to the research procedures;
- * Any serious accidental or unintentional change to the IRB-approved protocol that involves risk or has the potential to recur;
- * Any publication in the literature, safety monitoring report, interim result or other finding that indicates an unexpected change to the risk/benefit ratio of the research;
- * Any breach in confidentiality or compromise in data privacy related to the subject or others; or
- * Any complaint of a subject that indicates an unanticipated risk or that cannot be resolved by the research staff.

This letter constitutes official notification of the approval of the protocol change. You are therefore authorized to implement this change accordingly.

If you have any questions, please contact the IRB office at 472-6965.

Sincerely,



Becky R. Freeman, CIP
for the IRB



APPENDIX B

Food Service Manager Training Needs Survey

1. Why do you think schools in general are hesitant to add healthier food choices to their menus? Please mark all that apply

- Assumption/belief that “things are fine as they are”
- Students are less likely to buy healthier items
- There is a lack of available healthier products
- Healthier foods take more time in preparation and service
- Lack of knowledge on how to prepare healthier foods so children want to eat them
- Requires more equipment or different equipment than what is in place
- Healthier foods cost more
- Requires a change in kitchen layout
- Other (specify)_____

2. Why do you think schools in general are hesitant to add healthier food choices to their a la carte options? Please mark all that apply

- Assumption/belief that “things are fine as they are”
- Students are less likely to buy healthier items
- There is a lack of available healthier products
- Healthier foods take more time in preparation and service
- Lack of knowledge on how to prepare healthier foods so children want to eat them
- Requires more equipment or different equipment than what is in place
- Healthier foods cost more
- Requires a change in kitchen layout

Other (specify)_____

3. Which of the following barriers prevent you from purchasing foods lower in fat and sodium? Please mark all that apply

- Student food preferences
- Lack of student support

- Lack of parent support
- Lack of teacher support
- Lack of administrative support
- Lack of foodservice staff support
- Lack of ingredients
- Lack of adequate training
- Cost
- School meal requirements
- Not enough time
- Other (specify)_____

4. Which of the following barriers prevent you from preparing foods lower in fat and sodium? Please mark all that apply

- Student food preferences
- Lack of student support
- Lack of parent support
- Lack of teacher support
- Lack of administrative support
- Lack of foodservice staff support
- Lack of ingredients
- Lack of adequate training
- Cost
- School meal requirements
- Not enough time
- Other (specify)_____

5. Which of the following activities have you or anyone on your staff engaged in during the past 12 months?

- Attending a PTA or other parent group meeting to discuss the school food service program
- Providing families with information about the school food service program
- Inviting family members to eat a school lunch with their children
- Participating in a nutrition education activity in the classroom
- Conducting a nutrition education activity in the food service area
- Other (specify)_____

6. Do you use any of the following ways to get feedback from students or parents about USDA reimbursable meals?

- Surveys
- Suggestion box
- Bulletin board
- Web page
- Advisory council
- Other (specify)_____

7. What are your strategies in reducing fat content of school menus? Please mark all that apply

- Drain fat from cooked meat
- Bake, broil, or roast cooking method
- Defat broth
- Reduce the amount of regular cheese or mix part-skim with regular cheese
- Remove skin and fat from chicken and turkey
- Trim all visible fat from beef and pork before cooking it
- Try adding peas and dry beans to entrée and salad recipes
- Eliminate butter, oil, margarine, and animal fat and replace with vegetable oil
- Use low fat products
- Use non-stick coating spray or pan liner
- Use skim, low fat, or nonfat dry milk
- Use egg whites

8. What are your strategies in reducing sodium content of school menus? Please mark all that apply

- Reduce the salt in recipes or eliminate
- Use water, beef base seasoning (low sodium when possible), and flour, or make a dry roux for gravy. Do not add pan drippings
- Drain canned meat, poultry, and seafood
- Increase use of fresh, frozen, and dried fruits
- Drain canned vegetables to reduce sodium content
- Increase use of fresh, frozen, or unsalted canned vegetables and salads
- Reduce or eliminate salt added to vegetables
- Use more garlic, onion, powder, herbs, and spices

9. Please answer the following questions regarding whole grain products.

- In your school, most children eat enough servings of whole-grain food each day.
 - True
 - False
- A product must contain 16 grams of whole-grain flour to be whole grain
 - True
 - False
- After processing, the difference between whole grain and enriched, refined flour is that whole grain contains the bran and germ and refined flour does not.
 - True
 - False

- All labels are required to include information to determine the amount of whole grain per serving
 - True
 - False

10. Please mark (X) next to each category in the column that best describes your practices.

Category	Could do better in school meals	Could do better in the A la carte line	No changes recommended
Low fat content in food/snacks			
Low sodium content in foods/snacks			
Adequate fruits and vegetables			
Baking instead of frying			
Add more fiber/whole grains			
Appropriate portions as written in recipes			
Limited use of sugar and sweeteners			

11. Who receives the revenue or profit from vending machines? Please mark all that apply

- School food service department
- School
- Athletic department
- Student organizations
- Don't know

12. Where are vending machines available to students on the school grounds? Please mark all that apply

- No vending machines for students
- Food service area (indoor area where meals are served/eaten)
- Other indoor area(s)
- Outside school buildings

13. Who decided to place the vending machines that are available to students outside of the food service area? Please mark all that apply

- No vending machines outside of the food service area
- School food service director
- Kitchen manger
- Administrators
- Athletic director
- School district official
- Other (specify)_____
- Don't know

14. Do you have a high School Diploma or equivalent?

- Yes
- No

15. Which of the following degrees do you hold? Please mark all that apply

Degree	Nutrition & Consumer Science and related area	Unrelated to Nutrition & Consumer Sciences area
Master		
Bachelor		
Associate		
Some college		

16. Which of the following credentials do you hold? Please mark all that apply

Credential	Yes	NO
Registered Dietitian		
Dietetic Technician Registered		
Certified Food Service Manager with SNA		

17. How many professional development opportunities related to nutrition and food service do you receive per year?

- None
- 1-2
- 3 or more
- 5 or more

18. How many years of experience do you have in school food service?

- Less than 2
- 5-10
- 11-15
- 16-20
- More than 20

19. What type(s) of program topics would you be most interested in. Check all that apply:

- The 2010 Dietary Guidelines for Americans
- Promoting whole grains in school meals
- Promoting vegetables and fruits in school meals
- Promoting dry bean/peas
- Modifying recipes
- Menu planning
- Meeting the school lunch meal pattern requirement
- Meeting the competitive foods criteria
- Putting plans into action
- Other (specify)_____

20. What type of training method would be most convenient for you?

- Online (e.g., Webinars, videos, reading materials)
- One-on-one training
- Onsite group workshops

APPENDIX C
School Food Service Personnel Training Needs Survey
PART II

1. Based on your experience with school foodservice, please indicate your level of agreement with each item.

Question	Strongly Disagree	Disagree	Agree	Strongly Agree
a) Children who eat low-fat foods at school will be healthier than children who do not eat low-fat foods at school.				
b) Children who eat low-sodium foods at school will be healthier than children who do not eat low-sodium foods at school.				
c) Children who eat fruits & vegetables at school will be healthier than children who do not eat fruits & vegetables at school.				
d) Children who eat whole grain foods at school will be healthier than children who do not eat whole grain foods at school.				
e) Children who are overweight have more health risks than children who are normal weight.				
f) What a child eats at home is more important to a child's diet than what I serve at school.				

2. Based on your experience with the school food service, please indicate your level of agreement with each item.

Does your school.....	Never	Sometimes	Always
a. follow recipes, measuring all ingredients with standardized measuring utensils?			
b. serve menu items with standardized serving utensils?			
c. use fresh and/or frozen fruits and vegetables?			
d. use whole grain food items?			

3. Based on your experience with school food service, please indicate your level of agreement with each item.

Question	Not Sure	A little sure	Very sure
a. How sure are you that you can offer/serve whole grain items to your students?			
b. How sure are you that you can offer/serve fresh fruits and vegetables to your students?			
c. How sure are you that you can offer/serve low-sodium foods to your students?			
d. How sure are you that you can offer/serve low-fat foods to your students?			

4. According to the USDA new meal pattern, all the following items are classified as dark green vegetables except _____

- a. Romaine lettuce
- b. Spinach
- c. Kale
- d. Green beans

5. All the following items are whole grain except _____
- Brown rice
 - Quinoa
 - Semolina
 - Rolled oats
6. All the following items are classified as dry beans or peas except _____
- Navy bean
 - Green lima bean
 - Black eye pea
 - Chickpeas/Garbanzo bean
7. Eating fruits and vegetables and using whole wheat pasta helps boosts the _____ content of foods.
- Vitamin C
 - Vitamin A
 - Fiber
 - Calcium
8. According to “Choose My Plate”, which food group should provide the bulk of your diet?
- Meat/ beans
 - Grains
 - Fruits
 - Vegetables
9. Dietary fiber decreases the risk of which of the following health problem?
- Stroke
 - Scurvy
 - Rickets
 - Colon cancer
10. Which of the following do Americans need to consume more of?
- Vegetables
 - Fruits
 - Whole grains
 - Fruits, vegetables and whole grains
11. In what school category do you work?
- Elementary school

- b. Middle/junior high school
- c. High school
- d. All of these

12. On a daily basis, how much time do you spend at your job on the following tasks?

Categories	< 1 hour	2-4 hours	5-6 hours	7-8 hours	> 8 hours
Menu planning					
Purchasing food items					
Food preparation					
Cooking					
Serving					
Documenting					
Cleaning up/dish washing					

13. My main job title is:

- a. Cashier
- b. Cook
- c. Cafeteria staff
- d. Food service director
- a. Kitchen staff
- b. Manager
- c. Other

APPENDIX D
Focus Group
School Nutrition Services

Please answer the following questions:

1. How serious is childhood obesity in NE?
2. What are the health consequences of childhood obesity?
3. What is the major cause of childhood obesity?
4. How important is your role in preventing childhood obesity in your school?
5. How important is the school meal program in preventing childhood obesity for our country?
6. What actions does your school foodservice take to prevent childhood obesity in your school?
7. What kind of support do you get from your school in making changes to making your meals healthier?
8. What barriers did you encounter when working with your school to make your meals healthier?
9. How did you overcome these barriers? Please give examples
10. What partners have you engaged in your school nutrition program to support childhood obesity prevention efforts?
11. How do you know if your partnership efforts have been successful?
12. What type(s) of nutrition training have you had before? Please give examples. What did you like about this training? What did you not like?
13. Would you like to add any other suggestion that might be helpful to you to design a healthier school meal environment?

APPENDIX E
NDE Letter of Approval



Roger D. Breed, Ed.D., Commissioner
Scott Swisher, Ed.D., Deputy Commissioner

118

301 Centennial Mall South Tel: (402) 471-2295
PO Box 94987 Fax: (402) 471-0117
Lincoln, NE 68509-4987 Web: www.education.ne.gov

March 13, 2012

To whom it may concern:

Greetings,

The Department of Education would like to inform you of the approval to conduct the survey entitled "Food Service Manger Training Need Survey" by Zainab Rida, MS, RD, LMNT from Nutrition Services. Data will be collected via Survey Monkey and sent to a secure server. If there are any questions, please contact my office.

Sincerely,

A handwritten signature in black ink that reads "Dr. Sameano f. Porchea". The signature is written in a cursive style.

Sameano f. Porchea, Ph. D.
Senior Administrator
Data, Research, Evaluation & IT
Nebraska Department of Education
301 Centennial Mall South, 6th Floor
Lincoln, NE 68509-4987
Phone: 402-471-4740
Cell: 402-310-1614
Fax: 402-471-0117
Email: sameano.porchea@nebraska.gov

APPENDIX F

Recruitment Email to Participate in a Survey

EMAIL Correspondence –

Dear

Greetings,

The University of Nebraska-Lincoln and Nebraska Department of Education/ Nutrition Services would like you to kindly spare some of your valuable time and complete the survey that is at the following link:

The survey should take you about 15 minutes of your time. Your input would help us to effectively provide the necessary information to formulate useful trainings and activities that assist you with providing nutritious meals and snacks for students.

Please feel free to include any additional comments you deem necessary or relevant to help you adding healthier food choices to your school menus and snack options. Your response and time is greatly appreciated.

Best Regards

APPENDIX G

Reminder Email to Participate in a Survey

Dear Nebraska Department of Education Employee –

You have received a prior notice to voluntarily complete information regarding a Survey Monkey regarding food service manager training needs. If you choose to complete the survey, please do so before March 30th.

Thank you for your consideration.

The purpose of this research project is to assess the nutrition knowledge and perceptions of foodservice personnel in Nebraska to identify potential barriers and avenues of action for childhood obesity prevention. This is a research project being conducted by Nebraska Department of Education/Nutrition Services and the University of Nebraska-Lincoln. Your participation in this research study is voluntary. You may choose not to participate.

If you have any questions about the research study, please contact Zainab Rida at Zainab.rida@nebraska.gov, or Dr. Wanda Koszewski at wkoszewski1@unl.edu. This research has been reviewed according to University IRB procedures for research involving human subjects.

APPENDIX H
Consent Survey Form



Consent Survey Form

School Food Environment and Childhood Obesity Prevention Pilot

The purpose of this research project is to assess the nutrition knowledge and perceptions of foodservice personnel in Nebraska to identify potential barriers and avenues of action for childhood obesity prevention. This is a research project being conducted by Nebraska Department of Education/Nutrition Services and the University of Nebraska-Lincoln.

Your participation in this research study is voluntary. You may choose not to participate. If you decide to participate in this research survey, you may withdraw at any time. If you decide not to participate in this study or if you withdraw from participating at any time, you will not be penalized.

The procedure involves answering an online survey that will take approximately 15-20 minutes. Your responses will be confidential and we do not collect identifying information such as your name, email address or IP address. The survey questions will be about School Nutrition Services.

All data is stored in a password protected electronic format. To help protect your confidentiality, the surveys will not contain information that will personally identify you. Any direct quotes will not be referenced using any information that may identify the participants. The information during data process and reporting will not identify a single participant, but will rather be presented in a summarized format to the Department of Education/Nutrition Services. The results of this study will be used for the purpose of improving school food environment policies. Additionally, the result will be reported to the University of Nebraska-Lincoln as aggregate data in a dissertation, scientific journal, and/or at a conference.

If you have any questions about the research study, please contact Zainab Rida at Zainab.rida@nebraska.gov, or Dr. Wanda Koszewski at wkoszewski1@unl.edu. This research has been reviewed according to University IRB procedures for research involving human subjects. You may print a copy of this consent document for your personal records.

ELECTRONIC CONSENT: Please select your choice below.

Clicking on the "agree" button below indicates that:

- you have read the above information
- you voluntarily agree to participate
- you are at least 19 years of age

If you do not wish to participate in the research study, please decline participation by clicking on the "disagree" button.

ELECTRONIC CONSENT: Please select your choice below.
Clicking on the "agree" button below indicates that:

- you have read the above information
- you voluntarily agree to participate
- you are at least 19 years of age

If you do not wish to participate in the research study, please decline participation by clicking on the "disagree" button.

agree

disagree

Next

APPENDIX I

Consent Focus Group Form

Consent Focus Group Form School Food Environment and Childhood Obesity Prevention Pilot

The purpose of this research project is to assess the nutrition knowledge and perceptions of food service personnel in Nebraska to identify potential barriers and avenues of action for childhood obesity prevention. This is a research project being conducted by Nebraska Department of Education/Nutrition Services and the University of Nebraska-Lincoln.

Your participation in this research study is voluntary and there are no anticipated risks or benefits to participating in this focus group. You may choose not to participate. If you decide to participate in this research focus group, you may withdraw at any time. If you decide not to participate in this focus group or if you withdraw from participating at any time, you will not be penalized.

This focus group will allow you to discuss your opinions in an open and receptive setting. You will be asked to think of show topics and names. You will also provide feedback on provided ideas. Your comments and suggestions will be used for the purpose of improving school food environment policies. The time required for this focus group will take about 1.5 hour. You will be paid \$25.00 compensation for participating in this focus group. The discussion will be audio-tape recorded. The focus group questions will be about School Nutrition Services.

Your responses will be confidential and only my research advisor and myself will have access to the tapes, notes, and transcripts. They will be kept in a locked file. Your name will not be used in any report. All the information during data process and reporting will not identify a single participant, but will rather be presented in a summarized format to the Department of Education/Nutrition Services. The result will be shared with the University of Nebraska-Lincoln representatives for scholarly purposes that include class project, journal and conferences. Your presence at this focus group, your consent to participate will be implied. Please keep this letter for your records.

If you have any questions about the research study, please contact Zainab Rida at Zainab.rida@nebraska.gov, or Dr. Wanda Koszewski at wkoszewski1@unl.edu. This research has been reviewed according to University IRB procedures for research involving human subjects. You may also contact the office of IRB at (402)472-6965.

Agreement: I have read the procedure described above, I am at least 19 years old of age and I voluntarily agree to participate in the procedure and I have received a copy of this description.

Thank you for your time!

Sincerely,

Zainab Rida, MS, RD, LMNT
PhD Candidate



APPENDIX J

Recruitment Phone Script for Focus Group

Recruitment Protocol for conducting a focus group

Hello, my name is Zainab Rida from the Department of Education/Nutrition Services. I am working on my research that focuses on School Nutrition to assess foodservice personnel beliefs and knowledge regarding school meals. I am planning on conducting a focus group on June 26th, 2012 at the NE School Nutrition Association Annual Conference and I am inviting you to be part of this focus group. The focus group will take about an hour and a half to complete and you will be paid \$25.00 compensation for participating in this focus group.

1. Are you interested in hearing more about this research project?

IF NO: Terminate, Do not save. "Thank you. Have a nice day."

IF YES:

The focus group is being conducted to assess the nutrition knowledge and perceptions of food service personnel in Nebraska to identify potential barriers and avenues of action for childhood obesity prevention. This is a research project being conducted by Nebraska Department of Education/Nutrition Services and the University of Nebraska-Lincoln. Your input would help us to effectively provide the necessary information to formulate useful trainings and activities that assist you with providing nutritious meals and snacks for students. This focus group will allow you to discuss your opinions in an open and receptive setting. You will be asked to think of show topics and names. You will also provide feedback on provided ideas. Your comments and suggestions will be used for the purpose of improving school food environment policies.

The focus group will be held at the Holiday Inn in Kearney on 110 Second Ave Kearney, NE 68845 On Wednesday, June 26th, 2012 at 2:00 PM.

2. Are you interested in being considered for participation in this focus group?

IF NO: Terminate, Do not save. "Thank you, Have a nice day."

IF YES:

Wonderful! I will give you another call a week prior the focus group to confirm your participation in the focus group. Thank you so much. I look forward to meeting you.

APPENDIX K

IRB Letter of Approval (Focus Group)

June 19, 2012

Zainab Rida
Department of Nutrition and Health Sciences
6001 S. 74th st. Lincoln, NE 68516

Wanda Koszewski
Department of Nutrition and Health Sciences
119A LEV, UNL, 68583-0806

IRB Number:
Project ID: 12736
Project Title: School Food Environment and Childhood Obesity Prevention (relates to project ID 12346)

Dear Zainab:

The Institutional Review Board for the Protection of Human Subjects has completed its review of the Request for Change in Protocol submitted to the IRB.

1. It has been approved to compensate participants \$25 for participation in the focus group. The revised recruitment materials and informed consent form have also been approved.
2. The approved informed consent form has been uploaded to NUgrant (file with -Approved.pdf in the file name). Please use this form to distribute to participants. If you need to make changes to the form, please submit the revised form to the IRB for review and approval prior to using it.

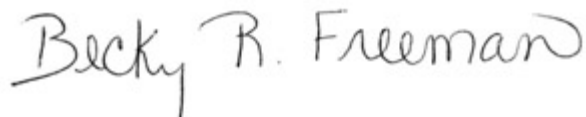
We wish to remind you that the principal investigator is responsible for reporting to this Board any of the following events within 48 hours of the event:

- * Any serious event (including on-site and off-site adverse events, injuries, side effects, deaths, or other problems) which in the opinion of the local investigator was unanticipated, involved risk to subjects or others, and was possibly related to the research procedures;
- * Any serious accidental or unintentional change to the IRB-approved protocol that involves risk or has the potential to recur;
- * Any publication in the literature, safety monitoring report, interim result or other finding that indicates an unexpected change to the risk/benefit ratio of the research;
- * Any breach in confidentiality or compromise in data privacy related to the subject or others; or
- * Any complaint of a subject that indicates an unanticipated risk or that cannot be resolved by the research staff.

This letter constitutes official notification of the approval of the protocol change. You are therefore authorized to implement this change accordingly.

If you have any questions, please contact the IRB office at 472-6965.

Sincerely,



Becky R. Freeman, CIP
for the IRB

