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PARENT'S USE AND LIKELY USE OF NUTRITION EDUCATION RESOURCES IN THE  
MISSISSIPPI DELTA REGION

A Thesis

Presented in partial fulfilment of requirements for the degree of  
Master of Science in Food and Nutrition Services in the  
Department of Nutrition and Hospitality Management  
The University of Mississippi

By

RACHEL J. SCOGGINS

May 2014

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## ABSTRACT

**Objective:** To identify nutrition education resources currently being used and those likely to be used if made available by parents of elementary-aged children in the Mississippi Delta region.

**Methods:** Surveys were completed by 214 parents (92% female, 88% African American) of children in grades K-2<sup>nd</sup> from three schools in the Mississippi Delta region. Survey items obtained nutrition education resources currently used by parents, those likely to be used if made available, mode of delivery and mediators (individuals) providing nutrition education.

**Results:** Parents reported high importance that their child eats healthy. Physicians were identified as the primary mediator for delivering nutrition information but nutritionists were the preferred mediator. The resources that parents currently use most frequently are nutrition facts labels (mean = 3.58, SD ± 1.31), television shows (mean = 3.24, SD ± 1.12), healthy homework activities (mean = 3.18, SD ± 1.40) and other information from their child's school (mean = 3.0, SD ± 1.31), and magazines (mean = 3.05, SD ± 1.11). The least used resources were video games (mean = 1.49, SD ± .87), in-person healthy cooking classes (mean = 1.76, SD ± 1.03), online discussion boards (mean = 1.75, SD ± 1.01), healthy cooking classes online (mean = 1.84, SD ± 1.06), and online meal planners (mean = 2.07, SD ± 1.15). The top resources likely to use in the future mirrored what is currently being used. The least used resources reflected those requiring internet or wireless connections which were; online discussion boards (mean = 2.47, SD ± 1.34), mobile phone applications (mean = 2.69, SD ± 1.42), online healthy cooking classes (mean = 2.76, SD ± 1.49), tips from social media sites (mean = 2.81, SD ± 1.41), and video games (mean = 1.95, SD ± 1.31).

**Conclusion and Implications:** Parents prefer traditional modes of delivery for nutrition education over internet and identified nutritionists as the preferred mediator. Future nutrition education resources and programs that tailor mode of delivery and format of nutrition education resources to parents' needs may have greater success in changing eating behaviors and foods prepared in the home.

DEDICATION

To my parents and beloved children

## LIST OF ABBREVIATIONS OR SYMBOLS

CDC Center for Disease Control and Prevention

DSL Digital Subscriber Line

DVD Digital Versatile Disc

HEI Healthy Eating Index Scores

TEAM Teachers, state Education department, health professionals from state Academic institutions, and primary caretakers (Mothers)

USDA United States Department of Agriculture

WIC Women, Infant, Children supplemental nutrition program

## ACKNOWLEDGEMENTS

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Thanks to the school principals for giving permission to survey their students' parents, which includes Michael L. Cormack Jr. from Quitman County Elementary School, SuzAnne Walton from Kirkpatrick Elementary School, and Johnny Vick from I.T. Montgomery Elementary School. Thanks to the school office staff and teachers for following survey dissemination. Thank you to the students for bringing the surveys home to their parents. Thank you to the parents for taking time to complete the surveys. Without the parents' responses, there would be no findings to report.

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## CHAPTER 1

### INTRODUCTION

The population of the Mississippi Delta, a geographical region in Mississippi, have the highest incidence rates in the nation for diet-related diseases such as obesity, hypertension, and diabetes (Consortium, 2004). This region also has the highest poverty rate in the state. In the Mississippi Delta, African American households with children living at home and having yearly incomes below \$15,000 have significantly higher rates of food insecurity compared to national averages (Stuff et al., 2004). Although there is limited research analyzing diet quality of families living in the Mississippi Delta, the investigations that have been published suggest that high poverty rates within this population have affected their diet quality. The majority of Mississippi parents are overweight (Center for Disease Control(CDC), 2011), and 50% of parents report that their children are overweight or obese (Carithers, Lambert, Parkes, Dickerson, & Dixon, 2013).

The home food environment is created through the interactions between the parent, the child, and the food within the home. The parent, influenced by nutrition knowledge, food preferences, finances, and time constraints, creates the food environment through the types of foods purchased and meals prepared for the family (Holsten, Deatrck, Kumanyika, Pinto-Martin, & Compher, 2012; Prelip, Thai, Erausquin, & Slusser, 2011). Through accurate knowledge regarding nutrition and self-efficacy to prepare healthful meals, the parent is able to provide a healthier eating environment (Prelip et al., 2011). Research has shown that lack of knowledge and financial barriers negatively impact the degree to which parents are involved in

their child's health (Crawford et al., 2008; Fulkerson et al., 2011). The Mississippi Delta population has been identified as having low health knowledge and literacy, making it a more challenging environment in which to disseminate and convey nutrition related information (Zoellner, Connell, Bounds, Crook, & Yadrick, 2009).

Tailoring educational resources based on an individual's characteristics such as their literacy level and preferences has been shown to be effective in increasing health awareness and diet quality in the low-income adult population (Clarke, Evans, & Hovy, 2011; Gans et al., 2009). Preferences for delivering nutrition information and connecting to Mississippi Delta adults were investigated and were found to be television, newspapers or magazines, and internet. Adults trusted information obtained through their health care providers and television more compared to information from the internet (Zoellner et al., 2009). Health care providers and other professionals, known as mediators, have access to populations and can provide information or implement educational programs for health improvement. Although physicians may be the preferred choice for communicating health or nutritional concerns, referral to other healthcare members better equipped to provide tailored education may be more beneficial in improving health (McKee, Maher, Deen, & Blank, 2010).

Many avenues and resources for nutrition education have been identified with varying success among parents; such as nutrition facts label education (Norgaard & Brunso, 2009; Tandon, Wright, Chuan Zhou, Rogers, & Christakis, 2010), school-based programs with a family component (Duncan et al., 2011; Greening, Harrell, Low, & Fielder, 2011), community-based nutrition education classes (Borden et al., 2012; Prelip et al., 2011), and internet-based nutrition education programs (Atkinson et al., 2009; Bensley, Anderson, Bruski, Mercer, & Rivas, 2011).

Further research is needed to assess the preferences for nutrition education resources among parents in the Mississippi Delta. Understanding what type of information resources are currently being used by the parents, and what type of information resources are likely to be used if made available will be beneficial to health educators in developing and disseminating nutrition education resources.

## CHAPTER 2

### LITERATURE REVIEW

#### **Parent's Nutrition Knowledge**

A parent's nutrition knowledge affects their ability to provide a healthy home food environment for their family. In addressing deficient nutrition knowledge among parents, implementation of nutrition education programs specifically targeting parents have been successful. Nutrition education has been beneficial in increasing healthy eating awareness among low-income parents with little nutrition knowledge (Prelip et al., 2011).

Along with improving nutrition knowledge, parents must also be taught the skills to transition into healthier behaviors like incorporating healthier foods into their diet. Previous research has examined changes in parents' knowledge with changes in family behavior related to healthy outcomes. Gained nutrition knowledge provides a foundation for parents to offer more healthful foods to their children, consequently increasing their children's consumption of fruits (Jones, Wells, Okely, Lockyer, & Walton, 2011; Rodenburg, Oenema, Kremers, & van de Mheen, 2012), vegetables, and water (Jones et al., 2011).

#### **Influences of Parent's Role in Providing Meals**

Parents affect food choices through purchasing and preparing foods within the home. Their active role in the food environment at home is affected by food preferences, time and activity pressures, effort to prepare meals, skill level of preparing meals, and concerns regarding

health (Holsten et al., 2012). Parents have reported that time available to spend on meal preparation is limited due to their busy lifestyles and employment. The lack of time and energy for meal preparation may lead to selection of foods that are easy and quick to prepare and serve but that are not necessarily healthy (Holsten et al., 2012). Longer working hours increases mothers' likelihood of relying on fast food for dinner (McIntosh et al., 2010). Furthermore, it has been reported that dinner is not viewed as a high priority among many employed mothers (McIntosh et al., 2010).

### **Parents' Financial Influences**

Economic status influences purchasing behavior and the availability of foods within the home. Low-income households are at higher risk of having foods that are low nutrient- and high energy-dense compared to higher income households (Prelip et al., 2011). Within low-income communities the ability to purchase nutritious foods is influenced by cost, accessibility, and availability (Dubowitz, Subramanian, Acevedo-Garcia, Osypuk, & Peterson, 2008; Hilmers, Hilmers, & Dave, 2012).

High poverty rates have led to the prevalence of food insecurity among the population living in the Mississippi Delta. African American households in the region, having children within the home, and yearly incomes below \$15,000, are more likely to have higher rates of food insecurity (Stuff et al., 2004). Food insecurity and hunger within the Lower Mississippi Delta region is significantly higher compared to national averages (Stuff et al., 2004).

There is limited research analyzing diet quality of families living in the Mississippi Delta. However the few studies that have been conducted have emphasized the need for further research and implementation of nutrition improvement interventions. Adults living in the Mississippi Delta have poorer diet quality compared to national averages for indicators such as inadequate



fruit and vegetable intake. Furthermore, Mississippi Delta African American adults' diet quality is poorer compared to white adults' diet quality (Champagne et al., 2004; McCabe-Sellers et al., 2007). In 2010, 80% of Mississippi parents indicated that they were "trying to eat healthier"(Carithers et al., 2013). However, findings show that their attempts to eat more nutritiously had little impact on their diet quality. In fact, Mississippi parents reported an increase in consuming less healthy foods, such as carbonated beverages. Furthermore, only one in five parents knew daily recommendations for fruit and vegetable intake(Carithers et al., 2013). The ability to comprehend health information, or health literacy, influences the extent to which an individual can use information to improve their health. Health literacy has been examined in the Mississippi Delta. Zoellner et al. (2011) determined the relationship between health literacy and Healthy Eating Index Scores (HEI) among the rural population in the Lower Mississippi Delta. More than half of participants were African American, did not have a college degree, and had a household income level less than \$20,000. Approximately 74% of participants' HEI scores were in the two lowest categories for health literacy. This finding indicates the majority of participants had low health knowledge and literacy therefore making it likely that they may have challenges to understanding nutrition related information (Zoellner et al., 2009).

While health and nutrition literacy is low among the Mississippi Delta population, understanding what type of information sources are used by this group may be beneficial in communicating health information. The best methods for delivering information and connecting to Mississippi adults were assessed and in descending order of use are: television, newspapers or magazines, and Internet. However, while not one of the top methods for information dissemination, participants trusted information obtained through their health care providers and television more than information from the internet (Zoellner et al., 2009). Dietary Guidelines for

Americans and other nutrition related resources are readily available online, but will be underutilized in a population that is less likely to use and trust the internet. Based on these findings, means for delivering nutrition information would most likely be more effective if delivered via television for a low nutrition literate population in the Mississippi Delta. However, quality internet access is increasing among rural areas within the United States (Horrigan, 2008). Therefore, further research is necessary to determine uses and preferences for educational resources delivered by various modes among the target population.

### **Tailored Educational Resources**

Tailoring is a technique that can be used to modify resources based on an individual's characteristics such as their demographics and preferences. Educational approaches use tailoring to individualize education based on the learner, and it has been shown to be effective in increasing health awareness and health status in the adult population. For example, tailored education increased positive perceptions of and intention to schedule a mammogram (Lin & Effken, 2010; Wang et al., 2008). In another study, Mouttapa et al. (2011) found that computer-tailored nutrition education increased dairy intake and significantly decreased weight of participants in a tailored group. Furthermore, attention to nutrition information is greater among tailored compared to non-tailored messages (Kessels, Ruiter, Brug, & Jansma, 2011).

Using tailored educational methods are more effective in educating underserved adult populations than using non-tailored methods. For example, tailoring recipe booklets for low-income food pantry participants based on their preferences for types of recipes and foods increased the amount and variety of vegetables purchased compared to handing out generic non-tailored booklets (Clarke et al., 2011). Similarly, increased fruit and vegetable intake and lower fat intake in a low-income ethnically diverse populations were observed after tailored

interventions based on their food selection and behaviors were developed and distributed (Gans et al., 2009).

Employed parents report difficulties in preparing nutritious meals due to “limited time for meal preparation and frequent multi-tasking at mealtimes” (Fulkerson et al., 2011). In addition to lack of time, low-income urban parents reported difficulties in providing healthful meals because of the cost of healthy foods and their children’s preferences for unhealthy foods (Slusser et al., 2011). Resources that provide strategies for parents to overcome these barriers would be beneficial to increasing the offering of healthy foods.

Several research studies have determined parents’ interest for nutrition information based on their personal preferences. Employed mothers prefer information with “ideas including feeding tips/recipes, meal planning/preparation, and changing food offerings” (Fulkerson et al., 2011). Also, parents, of eight to ten year old children, are interested in ways to overcome their children’s pickiness, prepare healthy recipes, and improve their children’s acceptance of meals (Fulkerson, Story, Neumark-Sztainer, & Rydell, 2008). Low-income urban parents showed interest in interactive nutrition resources, rather than “just learning specific facts” (Slusser et al., 2011). These parents also suggested cooking demonstration classes, providing tips for cooking healthy foods, and topics for nutrition education classes that included the importance of healthful eating, healthy food substitutions, improving children’s eating, portion size control, and nutrition label education (Slusser et al., 2011). The process of assessing the population’s characteristics and preferences is vital in executing tailored education. Using tailoring educational resources based on parents’ demographics and preferences may be beneficial in improving nutrition awareness, knowledge, and behaviors. There are three components that must be addressed for

tailored education programs to be successful. They are the mediator, the method of distribution, and the subject of education.

### **Mediator**

The mediator is the individual providing the information or implementing the education program. Trust influences an individual's preference for education mediators. Among Canadian parents of pre-K children, top mediators for receiving nutrition education included physicians, dietitians, and public health professionals (Rysdale, 2008). Among Hispanics the most trusted sources of nutrition information are physicians, nurses, and Women, Infant, and Children (WIC) staff (Chambers & Muñoz, 2009). Based on these findings physicians tend to be the most preferred source for obtaining health information across populations, but parents expressed frustration when there was lack of discussion about nutrition from their children's pediatrician. Parents found referrals by their healthcare provider, to a family lifestyle counselor, helpful in addressing their concerns, which focused on health improving strategies to meet their specific needs (McKee et al., 2010). Although physicians may be the preferred choice for communicating health or nutritional concerns, referral to other healthcare members better equipped to provide tailored education might be more beneficial in improving health.

### **Method of Distribution**

The method of distribution impacts how nutrition education is obtained, accepted, and incorporated into the adults' lives. Displays with health information were found to be an effective resource for educating a Hispanic adult population about nutrition. Feedback regarding format of educational displays included preference for "pictures, bright colors, simplicity, texts, relevant information, and accompanying handouts" (Chambers & Muñoz, 2009). Suggested locations for placing displays for basic nutrition information included stores, grocery stores, WIC

centers, physician clinics, libraries, parks, and schools (Chambers & Muñoz, 2009). Display boards can be a very effective way to reach parents. They are easy to move and place in areas that are frequented by parents and at very little cost to the health educator.

### **Method of Distribution: Connecting Home and School**

Two highly influential environments that parents interact with on a daily basis are their child's school and home. Several research studies have focused on bridging these two environments and connecting the interacting individuals—students, parents, and teachers—to improve family health. A healthy lifestyle promotion intervention program called “Healthy Homework” was incorporated into a 3<sup>rd</sup> grade school's curriculum. The program was premised on parent-child cooperation to complete health-related activities at home. This intervention approach was effective in improving children's health through increased steps per day, increased vegetable intake, and decreasing servings of unhealthy foods per day (Duncan et al., 2011).

An additional resource sent home from school, interactive children's books, were designed to have parents read to their children and complete health-related assignments together with topics such as the importance of consuming fruits and vegetables. Although findings were insignificant, parents reported their children consuming more servings of fruit and vegetables (Borra, Kelly, Shirreffs, Neville, & Geiger, 2003).

In the Mississippi Delta, TEAM Mississippi Project, a school-based program to decrease obesity among lower elementary age children was developed with an emphasis on inclusion of the family. The family intervention nutrition component included events such as a healthy tailgating recipe contest, a supermarket activity where parents and children select healthy foods together, a healthy snack selection contest, and listing what the family ate during the holidays. The TEAM Mississippi Project significantly improved the children's percentage body fat,

physical activity, performance on fitness tests, and dietary habits compared to the control group (Greening et al., 2011). The parents showed no significant changes in fat intake. However, parents in the control group, which did not include a family inclusion component, reported increased fat intake. This finding suggests that a family component in child nutrition interventions can be influential on the dietary intake of parents. Although in Greening et al.'s (2011) study, intervention group parents' dietary fat did not decrease like their children's, the parents' support and influence through other means, such as food availability, preparation, and prioritization of consuming healthful foods, seemed to be effective in improving their children's health. Through connecting the family with the school environment, children are supported in improving their health in their major influencing environments. These studies demonstrate that coordination between school and home environments by means of health improvement interventions can be effective in improving family health.

#### **Method of Distribution: Nutrition Education Classes**

Several parent-focused programs have been developed, which involve face-to-face educational sessions. One such program, Body Works, developed in response to First Lady Michelle Obama's Let's Move! Campaign, consisted of 10 weekly educational sessions targeted at parents of children ages 9 to 14 years old. Parents were recruited from community settings such as their children's schools, churches, pediatrician's offices, and health departments. Aspects of the program included food and physical activity journals, assistance in making grocery shopping lists, meal planners, information on nutrition, healthy recipe booklet, and a DVD emphasizing nutrition and physical activity lessons. Parents' nutrition knowledge increased, as well as their ability to purchase and prepare healthier foods. This program emphasizes the impact

that gained knowledge and self-efficacy has on parents and the family food environment (Borden et al., 2012).

Weekly educational workshops have shown to be effective in improving nutritional intake and behaviors among low-income parent participants in which 75% had less than a high school diploma, one-fifth were on food stamps, and only two-fifths had Internet access. Topics reviewed during the sessions included: MyPyramid, nutrients, food labels, meal planning, and eating out and snacks. Knowledge significantly increased among parents. Also, consumption and variety of fruit and vegetable increased, as well as food label use. However, sweet food, such as cake and brownies, consumption did not change (Prelip et al., 2011). Findings showed a significant decrease in availability of “tortilla chips, soda, and candy in the home” which demonstrates that educational class interventions among low-income parent populations can improve parents’ nutrition related behaviors.

### **Method of Distribution: Food Labels**

Food labels are readily available on all food packaging, and can aid parents when making food purchasing decisions based on nutritional value. It has been shown that individuals who use food labels consume healthier foods. Food label use may indicate improved dietary consumption, but their use is dependent on preconceived nutrition knowledge (Ollberding et al., 2011).

Health conscious parents are likely to make nutrition a priority in their family and use food labels as an aid in making healthy food purchasing decisions. However, parents who were confused by foods labels resorted to nutrition information found on the front of packaging when comparing nutrition information of foods (Norgaard & Brunso, 2009). Therefore, when educating parents with little nutrition knowledge, providing general nutrition education may prove more effective than solely suggesting use of food labels.

Tandon et al. (2010) conducted a study to determine if McDonald's restaurant menu nutrition facts affected parent's meal selection for themselves and their child. They found that parents provided with nutrition information selected about 100 fewer calories for their children compared to parents not receiving nutrition information. However, parents' own calorie amount did not differ with nutrition information.

### **Method of Distribution: Online Nutrition Education**

Technological advances such as online education and interactive resources, social networking websites, and online support groups provide alternative means for health education. Internet-based education programs have been found to be acceptable alternative to traditional education programs (Bensley et al., 2011). Disseminating nutrition knowledge is the cornerstone of care in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), and internet-based education modules used by WIC participants have been shown to be more acceptable than education classes. WIC participants enrolled in online nutrition education modules had higher participation rates, faster progression of readiness to change eating behaviors, and higher consumption of vegetable, fruit, and fruit juice compared to those enrolled in nutrition classes (Bensley et al., 2011). These findings emphasize the acceptability of online nutrition education, and these online modules may prove to be a more effective medium than face-to-face education sessions.

Online education can bring different advantages to the learner. Online sessions, unlike in-person sessions, provide the ability for the learners to control their own pace. However, internet education can diminish the customary student-teacher interactions, which may have a negative effect on the learner's value of the educational session due to personal learning preferences (Margolis, Grediagin, Koenig, & Sanders, 2009).



### **Method of Distribution: Search for Online Health Information Behaviors**

The Internet is a valuable resource for obtaining information about health and nutrition. Key demographics have been identified for those individuals who are most likely to access the Internet and those most unlikely to access the Internet for health related information. The majority of individuals accessing the Internet for health-related activities are women who are under the age of fifty, non-Hispanic white, married, have completed some college, and have an annual income over \$50,000. Those less likely to access health information online are less educated, have at least three children under the age of eighteen, and have slow Internet connection (such as dial-up compared to cable or DSL)(Atkinson et al., 2009). This underlines the importance of knowing your target audiences' demographics and the technology available to them when developing nutrition education programs and their delivery modes.

### **Method of Distribution: Tailored Online Materials**

Online delivery works by allowing parents to participate in education programs when their schedule permits. In one study, parents stated that tailored online education modules were a feasible inclusion in their schedules (Jones et al., 2011). Parents were able to access online modules that included individualized activities and weekly goal setting to improve their family's health. Also, a health consultant was available by email for specific questions during the intervention. The online intervention was shown to be successful in increasing parents' knowledge and healthy behaviors. While online programs have been successful in addressing some of the barriers parents may face in attending traditional classroom programs, the issue of Internet accessibility among varying populations still proves to be a challenge.

On average, health education resources that are available online have been found to be written at high health literacy level comparable to a tenth grade reading level. This high literacy

level may make it difficult to comprehend by low literate populations (US Department of Health and Human Services, 2006). Using tailored online educational sources for low socioeconomic and literate populations may help in overcoming this barrier. Atkinson et al. (2009) developed a user-centered online website and materials based on focus group discussions with low-income rural mothers. Participants were excited about a website that was “tailored to their personal goals and needs” (Atkinson et al., 2009). After development of the website, all participants tested and reported high ease of use and acceptability even among those with low-computer experience. To further tailor the site, users suggested increased site interaction, graphics, and activities for visual learners, and decreased text density by bulleting (Atkinson et al., 2009). Online materials tailored to meet the needs and preferences of low-income rural populations are beneficial in overcoming literacy barriers that currently exist.

#### **Method of Distribution: Online Support Groups**

Other available Internet resources are online support groups, such as bulletin boards and chat rooms, which link individuals with similar interests. Findings from the Health Information National Trends Survey indicate that only 3.9% of 6,369 adults surveyed reported participation in online support groups. Discussion board use is evident among low-income populations, however. Individuals with incomes less than \$25,000 are more than twice as likely to use online support groups, compared to those with incomes above \$50,000 (Hesse et al., 2005). Low-income individuals may be using online support groups as a replacement for traditional healthcare in managing their health (Atkinson et al., 2009).

#### **Method of Distribution: Social Media**

Similar to online support groups, social media is described as an online community to “share information, knowledge, and opinions using conversational media” (Safko & Brake,

2009). Social media also included message boards, social networking sites, and blogging sites (Sterne, 2014). In a study of 1,745 U.S. adults, 41% reported online health seeking practices with 32% using social networking sites, 10% using posted reviews, and 15% using posted comments or questions (Thackeray, Crookston, & West, 2013). Income, education status, and age are factors that influence the type of social media used by adults.

Adults with chronic disease are nearly twice as likely to use online health-related information. However those adults with less formal education showed lower instances of consulting online resources. Younger individuals are more likely to use social networking sites (Thackeray et al., 2013). These factors could be used to tailor education using social media resources. Social networking sites may be a useful tool in targeting specific populations based on their profile characteristics. The social networking site, Facebook, has shown to be effective for recruiting low-income women for online nutrition education (Lohse, B., 2013). While this study was not focused on reaching parents, 46% of those recruited were parents. Setting a parent status criteria on Facebook would be a useful tool in assisting education programs in recruiting their targeted audience.

### **Method of Distribution: Touchscreens and Kiosks**

Interactive technology, such as touchscreens, kiosks, video games, and mobile phone applications, are often used for nutrition education with the adult populations (Abroms, Padmanabhan, Thaweethai, & Phillips, 2011; Baranowski, Buday, Thompson, & Baranowski, 2008; Lieffers, Vance, & Hanning, 2014; Thompson et al., 2012). These devices provide text, audio, and pictures to present nutrition information. The use of touchscreen devices for nutrition education was found acceptable among low-income Hispanic parents who never or rarely used a computer and who had at or below an eighth grade education. Over 90% of parents reported that

the modules were easy to use, provided useful information and were easy to understand (Thompson et al., 2012). These findings demonstrated that for low socioeconomic individuals with little computer experience, touchscreen devices are an effective delivery medium for nutrition education.

Kiosks have also been proven effective in educating parents about nutrition. Thompson, Lozano, and Christakis (2007) placed kiosks in several locations around the community of Seattle, Washington such as the public library, Department of Motor Vehicles, and McDonald's restaurant. The kiosks provided parents with healthy lifestyle information for their children. Of the parents who participated, 48% had completed twelfth grade or less, and 26% reported never previously accessing a computer. However, ease of use was reported by about half of parents. Parents reported intentions to use information learned and discuss concerns with their children's pediatrician. Placing kiosks in community settings where parents typically go was shown to be an ideal method for reaching parents.

### **Method of Distribution: Video Games**

Video games appeal to a large and diverse audience and can be played in at home or away. Fifty-eight percent of Americans play video games, and fifty-one percent own at least one game console. Thirty-five percent of parents reported playing video games with their children weekly with 71% of parents of children under 18 years old stating that they "believe game playing provides mental stimulation or education" (Entertainment Software Association, 2013). Video games incorporating goal setting and use of story-lines increased knowledge and changes in attitude and behavior (Baranowski et al., 2008). Incorporating health-related behavior change into video games is still in its early stages, but they may have a positive future due to games' ability to attract a diverse audience.

## **Method of Distribution: Mobile Phone Applications**

Mobile phone applications are one of the latest developments in health improvement technology. The market for health related applications is vast and research in this area is in its early stages. Currently, there are no guidelines mandating that mobile phone application have to be based on research; therefore, they may not be the most accurate resource available to promote health. One such study analyzed the adherence to smoking cessation guidelines of iPhone applications and discovered that the majority of applications are not based on evidence-based practices (Abroms et al., 2011). In 2012, 49% of the United States population used smartphones. The top four phone applications used on smartphones were Internet, Facebook, web browsing, and games (Levitas, 2012). Several avenues for health information and education can be incorporated into one source—the smartphone. This aspect of phone applications may be especially useful when tailoring education to the parent population.

When tailoring nutrition education resources one should identify and assess parents' demographics, their preferred mediators, and their preferred mode of distribution. The purpose of this study was to determine nutrition educational resources that parents living in the Mississippi Delta either currently or would likely use, and their preferred mediator for receiving information.

CHAPTER 3  
RESEARCH QUESTIONS AND HYPOTHESES

**Research Questions**

1. What are the current nutrition education resources (mediator, method of distribution, and topic) being accessed by parents of elementary students in the Mississippi Delta region?
2. What are the nutrition education resources (mediator, method of distribution, and topic) that parents of elementary students in the Mississippi Delta region are most likely to use?

**Hypotheses**

1. There are significant differences between current nutrition education resources accessed by parents in the Mississippi Delta region and those resources they most likely would use if made available.
2. There is a significant difference between current and most likely use of nutrition education resources based on parent's importance that their child eat healthy.
3. There is a significant difference between current and most likely accessed nutrition education resources based on parent's demographics.

CHAPTER 4  
MANUSCRIPT

**ABSTRACT**

**Objective:** To identify nutrition education resources and mode of delivery preference by parents of elementary children in the Mississippi Delta.

**Methods:** Parents (n=214) from 3 elementary schools in the Mississippi Delta were surveyed to identify nutrition education resources currently used and those likely to be used if made available. Also investigated were the preferred mode of delivery and mediators (individuals) providing nutrition education.

**Results:** Nutrition education resources parents identified as ‘currently using’ and ‘likely to use if made available’ were similar and included: nutrition facts labels, health information and homework activities from school, television shows, and magazines. Least used resources were those requiring internet or wireless connections. Physicians were the primary mediator currently providing nutrition education resources, but nutritionists were identified as the most preferred mediator.

**Conclusion and Implications:** Parents prefer traditional modes of delivery for nutrition education resources over the internet or wireless, and nutritionist are the preferred mediator.

**Key Words:** nutrition education, rural community, low-income, parents

## **INTRODUCTION**

The Mississippi Delta, a geographical region in Mississippi, is highest in the nation for diet-related diseases such as obesity, hypertension, and diabetes (Consortium, 2004). This region also has the highest poverty rate in the state (Food and Nutrition Services, 2011). In the Mississippi Delta, African American households with children living at home and yearly incomes below \$15,000 have significantly higher rates of food insecurity compared to national averages (Stuff et al., 2004). There is limited research analyzing diet quality of families living in the Mississippi Delta. (CDC, 2011), and 50% of parents reporting their children as overweight or obese (Carithers et al., 2013) The home food environment is created through the interactions between the parent, the child, and the food within the home. The parent, influenced by nutrition knowledge, food preferences, finances, and time constraints, creates the food environment by the types of foods purchased and meals prepared for the family (Holsten, Deatrck, Kumanyika, Pinto-Martin, & Compher, 2012; Prelip, Thai, Erausquin, & Slusser, 2011). Through accurate knowledge regarding nutrition and the self-efficacy to prepare healthful meals, the parent is able to provide a healthier eating environment (Prelip et al., 2011). Research has shown that lack of knowledge and financial barriers negatively impact the degree to which parents are involved in their child's health (Crawford et al., 2008; Fulkerson et al., 2011). The Mississippi Delta population has been identified as having low health knowledge and literacy, making it a more challenging environment in which to disseminate and convey nutrition related information (Zoellner, Connell, Bounds, Crook, & Yadrck, 2009).

Tailoring educational resources based on characteristics such as literacy level and preferences has been shown to be effective in increasing health awareness and diet quality in low-income adult populations (Clarke, Evans, & Hovy, 2011; Gans et al., 2009). Effective



methods for delivering nutrition information to Mississippi Delta adults were found to be television, newspapers or magazines, and internet. Adults trusted information obtained through their health care providers and television more than information from the internet (Zoellner et al., 2009). Mediators (health care providers and other professionals) have access to populations and can provide information or implement educational programs for health improvement. Although physicians may be the preferred mediator by adults for communicating health or nutritional concerns, referral to other healthcare members better equipped to provide tailored education may be more beneficial in improving health (McKee, Maher, Deen, & Blank, 2010).

Many avenues and resources for nutrition education have been investigated and shown varying success among parent populations such as nutrition facts label education (Norgaard & Brunso, 2009; Ollberding, Contento, & Wolf, 2011; Tandon, Wright, Chuan Zhou, Rogers, & Christakis, 2010), school-based programs with a family component (Duncan et al., 2011; Greening, Harrell, Low, & Fielder, 2011), community-based nutrition education classes (Borden et al., 2012; Prelip et al., 2011), and internet-based nutrition education programs (Atkinson et al., 2009; Bensley, Anderson, Brusk, Mercer, & Rivas, 2011).

Preferences for nutrition education resources specific to parents in the Mississippi Delta have not been identified. Understanding what type of information resources are currently being used by parents and what type of information resources parents would likely be used if made available will be beneficial to health educators in developing and disseminating nutrition education resources.

## **METHODS**

### **Participants**

Parents or guardians of students in grades kindergarten through second grade were solicited from a convenient sample of three elementary public schools from three counties in the Mississippi Delta. Schools selected were those with greater than 50% of students eligible for free and reduced-price meals, allowing researchers to reach a low-income parent population.

### **Survey Instrument**

A survey design was used to collect data on nutrition education resources low-income parents currently use and would most likely use if made available in assisting them with improving their family's healthy eating. Survey questions were developed by the researcher through a review of literature and the assistance of experts in the fields of nutrition and education, who also reviewed the survey for clarity and inclusiveness.

The survey included two items addressing importance to the parent of their child eating healthy using a 5-point Likert-type scale with 5 being very important and 1 being not at all important. The next section addressed how often parents received nutrition education resources from five mediators (child nutrition directors, teachers, nurses, nutritionists, and physicians) using a 3-point Likert-type scale with 3 being frequently and 1 being never. Additionally parents were asked which mediator they would prefer, using a ranking system of 1 being most preferred and 5 being least preferred. The third section included different nutrition education resources (Table 1) and asked parents how often they currently use (14 items) and would likely use (14 items) each of the resources based on a 5-point Likert-type scale with 5 being always and 1 being never. The last four questions of the survey asked parents to identify their education, age, gender, and race.

The survey was piloted by six parents of elementary school children who evaluated the survey for clarity of instruction, readability, and content of items. The researcher received written permission from three principals allowing teachers to be surveyed in their schools during October 2013. This study was approved by the institutional review board at the researcher's affiliated institution.

### **Data Collection**

Survey packets for teachers in grades K-2<sup>nd</sup> were delivered to front office school personnel who issued them to teachers. Survey packets included a cover letter for the teacher explaining the purpose of the study and procedures for survey distribution. There were also envelopes containing a survey and cover letter for parents of each student which explained the study's purpose, that participation was voluntary and confidential, and the researcher's contact information to answer any questions regarding the study. Finally, small toys were included as incentives for students whose parent completed the survey.

Teachers were instructed to distribute surveys to students on a Monday and have the students deliver the surveys to their parents. Parent completed the survey and had their child return it to his/her teacher. Teachers were instructed to remind students on Monday the following week to return surveys by the deadline, which was Thursday of that same week. As surveys were returned, teachers were instructed to place them back into the survey packet and gave the incentive to students who returned surveys. To avoid any potential class disruption it was suggested for teachers to offer incentives to all students after the deadline for survey collection. Teachers returned surveys packets to the front office from where they were collected by the researcher. The method design used has been shown to be reliable when surveying parents of elementary school-aged children (Jaballas, Clark-Ott, Clasen, Stolfi, & Urban, 2011).

## **Measures**

Descriptive statistics of means, standard deviations, and frequencies were used to summarize responses. A paired t-test was used to identify any significant differences between fourteen items measuring ‘current use’ and 14 items measuring ‘likely use’ of nutrition education resources. A one-way analysis of variance and post-hoc LSD test was conducted to evaluate the relationship of parent responses for current use and likely use of nutrition education resources with demographics of education level, age, and race. Cronbach’s Alphas were used to determine internal reliability of the 14 items measuring ‘current use’ and 14 items measuring ‘likely use.’ All items loaded at 0.7 or greater. All statistical analyses were performed using SPSS version 21 (SPSS Inc., Chicago, IL, 2012).

## **RESULTS**

### **Participants**

All three participating schools had 98% or greater student eligibility for free and reduced-price meals. For survey distribution, school one received 272 surveys, school two 163, and school three 151 for a total of 586 surveys. A total of 319 (54%) parents returned surveys. Due to incomplete responses, 105 surveys were omitted resulting in 214 (37%) surveys used for analysis. Return rates for completed surveys were; school one 35% (n=95), school two 37% (n=63), and school three 37% (n= 56). The majority of participants were African American (88%) which is comparable to race percentages reported for the three Mississippi counties in which surveys were distributed (United States Census Bureau, 2013). The majority of participants were female (92%), age 25 to 34 (59%), with High School/GED (29%), some college education (31%), and 2-year college degrees (18%) (Table 2).

### **Nutrition information mediator**

The majority of parents answered that it is very important that their child eats healthy (92%, n = 197) and that they provide healthy meals to their children (87%, n = 187). This indicates that these parents are likely interested in receiving nutrition education resources. Parents reported they receive nutrition information sometimes to frequently from a physician (70%, n = 149), a nutritionist (55%, n = 118), a nurse (49%, n = 104), their child's school nutrition director (43%, n = 92), and their child's teacher (40%, n = 86). Nutritionists were ranked the most preferred choice to receive nutrition information by 53% (n=114) of parents, with physicians ranked second at 32% (n = 69).

### **Parents' current use and likely use of nutrition education resources**

The top five nutrition education resources parents currently use are nutrition facts labels (mean = 3.58, SD  $\pm$  1.31), television shows (mean = 3.24, SD  $\pm$  1.12), healthy homework activities from their child's school (mean = 3.18, SD  $\pm$  1.40), magazines (mean = 3.05, SD  $\pm$  1.11), and information sent home from school (mean = 3.0, SD  $\pm$  1.31) (Table 1). The five resources least used by parents were video games (mean = 1.49  $\pm$  .87), in-person healthy cooking classes (mean = 1.76, SD  $\pm$  1.03), online discussion boards (mean = 1.75, SD  $\pm$  1.01), healthy cooking classes online (mean = 1.84, SD  $\pm$  1.06), and online meal planners (mean = 2.07, SD  $\pm$  1.15).

The top five resources parents would likely use are healthy homework activities from their child's school (mean = 4.21, SD  $\pm$  .95), information sent home from school (mean = 4.15, SD  $\pm$  .94), nutrition facts labels (mean = 4.03, SD  $\pm$  1.27), television shows (mean = 3.45, SD  $\pm$  1.22), and magazines (mean = 3.31, SD  $\pm$  1.26). Parents reported they would least likely use video games (mean = 1.95, SD  $\pm$  1.31), online discussion boards (mean = 2.47, SD  $\pm$  1.34),

mobile phone applications (mean = 2.69, SD  $\pm$  1.42), healthy cooking classes online (mean = 2.76, SD  $\pm$  1.49), and tips from social media sites (mean = 2.81, SD  $\pm$  1.41).

Cronbach's Alpha determined high internal reliability for all 14 items listed for current use ( $\alpha = .850$ ) of nutrition education resources and all 14 items listed for likely use ( $\alpha = .929$ ) of nutrition education resources. Paired t-tests determined there were statistical differences ( $p < .00$ ) between the 14 current use and 14 likely use nutrition education resources (Table 1). A one-way analysis of variance was conducted on the 14 current use and 14 likely use nutrition education resources and the parent demographics. Statistical significance was found between groups for current use of healthy eating websites,  $F(5, 208) = 3.46$ ,  $p = .005$  and healthy eating tips from friends on Facebook, Twitter, or Pinterest (social media),  $F(5, 208) = 2.93$ ,  $p = .014$  and education. An LSD post-hoc test revealed that current use of healthy eating websites among parents with high school or GED education was significantly lower for parents with some ( $p = .003$ ), 2 years ( $p = .007$ ), or greater than 4 years ( $p = .001$ ) of college. Also, current use of healthy eating tips from social media among parents with some college was significantly higher than parents with high school/GED ( $p = .014$ ) and 4 years of college ( $p = .019$ ). Current use among parents with 2 years of college was significantly higher than among parents with high school/GED ( $p = .031$ ) and those with 4 years of college ( $p = .028$ ). And, current use among parents with greater than 4 years of college was significantly higher than parents with high school/GED ( $p = .013$ ) and parents with 4 years of college ( $p = .011$ ).

## **DISCUSSION**

The Mississippi Delta is an area with high poverty and high obesity rates. A survey study was conducted with parents in this region to identify current use and likely use of nutrition education resources.

## **Importance of healthy eating and mediators**

Consistent with two previous studies among low-income parent populations (Fulkerson et al., 2011; Fulkerson, Story, Neumark-Sztainer, & Rydell, 2008), parents in this study believed healthy eating within the context of their family environment is important and are interested in nutrition and healthy eating for their children.

Parents reported that physicians are a primary mediator for delivering nutrition information. Previously, physicians and health care providers were identified as the preferred and most trusted source for nutrition information by individuals living in the Mississippi Delta (Zoellner et al., 2009). Physicians are oftentimes the main health care provider seen by parents and their children. However, concerns have been raised that physicians may not have adequate backgrounds and/or knowledge to provide appropriate nutrition education (Adams, Kohlmeier, & Zeisel, 2010; Kohlmeier, Adams, & Zeisel, 2012).

Nutritionists were identified by parents as the second most common source for receiving nutrition information. With 84,559 participants in the Mississippi Women, Infants, and Children (WIC) supplemental food program, many Mississippi Delta women are receiving nutrition information from nutritionist with this program (Food and Nutrition Services, 2014d) Through this program, low-income women and their children up to age five, have access to nutritionists (Food and Nutrition Services, 2014d). The extent of interaction that the parents were having with nutritionists and the type of information they were receiving from these mediators was not determined.

Another nutrition assistance program available to low-income individuals and families is the Supplemental Nutrition Assistance Program (SNAP)(Food and Nutrition Services, 2014b). The 2010 SNAP report stated that 51,122 households received benefits in the districts

encompassing the Mississippi Delta (Food and Nutrition Services, 2011). Parents not receiving access to nutritionists through WIC program could be reached with nutrition education through the SNAP program. Nutrition education resources are available to SNAP providers on the Food and Nutrition Services website (Food and Nutrition Services, 2014b). However at the present time there is no nutrition education protocol established (Food and Nutrition Services, 2014c). This study also investigated parents' preferred mediator for delivering nutrition information and found that 53% (n = 114) of parents ranked nutritionists as their most preferred, with 32% (n = 69) ranking physicians as most preferred and 24% (n = 52) ranking child nutrition directors. Nurses and teachers were least preferred receiving the number one ranking by only 12% (n = 26) and 7% (n = 15) of parents respectively. Percentages total greater than 100 due to some parents ranking more than one mediator as their preferred. Since parents in this study reported they would prefer to receive information primarily from nutritionists, future research should investigate and justify the need for nutritionists in a rural community setting. Access to specialty healthcare professionals is oftentimes limited in rural settings (Averill, 2003) especially with nutritionists because of financial and job opportunity barriers preventing them from seeking employment in these regions (Brown, Mitchell, Williams, Macdonald-Wicks, & Capra, 2011)

Because this study did not assess education qualifications of child nutrition directors, it is unknown if any of the child nutrition directors were a nutritionist. It has been shown that schools' having nutritionists increase the likelihood of participation in federal child nutrition program initiatives such as Team Nutrition programs (Ohri-Vachaspati, Turner, & Chaloupka, 2013).

The child nutrition director may be the best mediator for sending home nutrition information with students such as monthly menus, healthy eating suggestions, and food



preparation tips. Mississippi child nutrition directors are required to meet education requirements of a minimum of six college credits in nutrition or food system management related courses (MS Department of Education, 2012). Additionally directors are required to attend a five day orientation or review seminar every three years that includes a nutrition education component (Mississippi Office of Healthy Schools, 2014).

Only 7% of parents identified their child's teacher as a preferred mediator, although parents reported receiving nutrition information and healthy homework activities sent home from school as two of the top five current used and likely use resources (Table 1). The mediator responsible for sending nutrition information and homework activities home to parents from their child's school was not determined by this study. Previous research findings have determined that parent involvement in school-based nutrition education programs is a successful component in improving diet quality among families (Katz et al., 2011; Kirks, Hendricks, & Wyse, 1982).

### **Current used nutrition education resources**

The nutrition facts label is currently being used (mean = 3.58, SD  $\pm$  1.31) and likely to be used (mean = 4.03, SD  $\pm$  1.27) by parents in this study. Previous research identified use of nutrition facts labels by parents with higher nutrition knowledge (Norgaard & Brunso, 2009). While sixty-percent of parents in this study had greater than a high school education, the extent of their nutrition knowledge was not measured. It has been reported that the Mississippi Delta population has low health knowledge (Zoellner et al., 2009). When nutrition education materials are received by parents from their child's school, nutrition facts label reading has been shown to increase (Katz et al., 2011).

Current use (mean = 3.24, SD  $\pm$  1.12) and likely use (mean = 3.45, SD  $\pm$  1.22) of television shows and current use (mean = 3.05, SD  $\pm$  1.11) and likely use (mean = 3.31, SD  $\pm$

1.26) of magazines were two other top resources. The present findings are consistent with a previous study that found that the Mississippi Delta adult population trusted television as a health education resource (Zoellner et al., 2009). With the numerous food television shows available it is not surprising that this would be a popular resource.

The nutrition education resources that parents are currently using the least are online discussion boards, online cooking classes, online meal planners, video games, and in-person cooking classes. Parents may lack access or means to use online resources. While online resources have been successfully used for improving nutrition knowledge and behavior (Atkinson et al., 2009; Jones, Wells, Okely, Lockyer, & Walton, 2011) and are an acceptable alternative to traditional education programs (Bensley et al., 2011), this study showed online nutrition education resources may not be suitable or well received by parents in the Mississippi Delta. In 2008, it was predicted that the rate of access to broadband internet would increase in rural areas (Horrigan, 2008). Prior to developing nutrition education resources it should be determined if the targeted population is receptive and has internet access.

The least current use and likely use nutrition education resources only differed slightly. Four of the five least likely use nutrition education resources were discussion boards, social media, mobile phone applications (apps), and online meal planning, which all require access to internet or wireless connections. Inconsistent with this study, it was found that low-income populations use discussions boards for seeking health information (Hesse et al., 2005). Also, recruiting low-income women for nutrition education through the use of social media networking sites has been shown to be successful (Lohse, B., 2013).

Parents reported not currently using in-person healthy cooking classes (mean = 1.76, SD± 1.03). However it appears that parents would like to have (mean = 3.05, SD ±1.51) this resource.

In-person healthy cooking classes could be an additional opportunity for nutritionists or child nutrition directors to collaborate with parents and increase healthy eating in the family. However, means of transportation and childcare during the classes may be needed to enable participation (Lambert, 2005).

Video games (mean=1.95, SD  $\pm$ 1.31) were the number one least 'likely use' nutrition education resource. This may be unfortunate since nutrition education video games have been shown to positively change diet behavior and are adaptable to diverse populations (Baranowski, Buday, Thompson, & Baranowski, 2008).

While mobile phone apps were not likely to be used by respondents in this study, they have been viewed as an acceptable education tool by those implementing nutrition education (Lieffers, Vance, & Hanning, 2014). Researchers identified that nutrition education apps were not reliable sources of accurate information (Abroms, Padmanabhan, Thaweethai, & Phillips, 2011). Ensuring mobile apps provide valid and reliable education is necessary if used by nutrition educators.

This study has limitations that warrant consideration. This study was conducted in counties located in the northern half of the Mississippi Delta region. These results may not reflect other areas of the Mississippi Delta region or other populations who differ in geographical location, demographics, and culture. While the survey covered an extensive list of nutrition education resources, other methods such as focus groups may be beneficial in obtaining additional nutrition education resources used by this population. It was not determined if parents were participants of the WIC program. This information could provide more insight as to parents' preference for nutritionists as mediators. The specific mediator who sent nutrition information and homework activities home from the school was not identified nor the type of

nutrition education received from school. Barriers parents may face in receiving nutrition education resources were not assessed; such as access to internet, computers, and smartphones or mobile phones. It was not determined if parents had financial, transportation, or childcare difficulties which may be a barrier preventing them from benefits of nutrition education resources. Although incentives were used to increase participation rates in this study, parents might have completed the survey for the sole purpose of their child receiving the incentive, jeopardizing validity of responses.

### **IMPLICATIONS FOR RESEARCH AND PRACTICE**

The study's findings highlight key areas for nutrition educators to target in developing intervention programs. While previous research reported adults in the Mississippi Delta preferred the internet in receiving health information (Bensley et al., 2011; Zoellner et al., 2009), this study found that parents preferred more traditional delivery modes of nutrition education through nutrition information and homework activities sent home with their children from school. The schools can be a tremendous conduit in communicating with all parents of elementary school children. The format and subject matters for nutrition education that parents are most receptive to should be further explored and their impact measured.

While previous research reported that future internet connections and use were anticipated to increase in rural areas (Horrigan, 2008) this may not be the case in the rural Mississippi Delta region. Parents in this study identified four of the five least currently use and likely use nutrition education resources as those obtained through internet or wireless access. That parents were not receptive to this delivery mode may be due to lack of internet service or access to the internet or financial restraint keeping them from receiving internet and the technological hardware required.

Second to physicians, parents currently receive most of their nutrition education from nutritionists. However, nutritionists were identified as the preferred mediator. It is suggested that with the demographics of this parent population, there may be high participation rates in WIC programs and therefore exposure to the services of nutritionists. Currently WIC services 84,559 parents in Mississippi (“WIC Program: Total Participation,” 2014). WIC nutritionists have been reported as being a trusted source for nutrition information. However, when children reach the age of five, parents are no longer eligible for WIC services. Since a relationship with nutritionists has been established, other routes in which nutritionists could make contact with this population should be explored.

An unexpected finding was that parents identified teachers and child nutrition directors as the least preferred mediators of nutrition education resources. Schools participating in federally funded school meal programs are required to meet national nutritional guidelines (Food and Nutrition Services, 2013b). Numerous nutrition education resources are available to child nutrition directors through various government agencies (CDC, 2014; USDA, Food and Nutrition Services, 2014; Mississippi Office of Healthy Schools, 2014) in addition training and education in the nutrition field. It would be worthwhile to investigate how school child nutrition directors could establish a stronger relationship with parents in efforts to be viewed as a preferred mediator. These efforts could also be in collaboration with teachers and the school as a whole.

In efforts to address obesity and improve nutrition in the Mississippi Delta population it is important to realize that parents play a key role in the type of foods purchased and meals prepared within the home. With appropriate and accessible nutrition education resources, parents can be better equipped to provide healthy food environments. The findings of this study will be

valuable to nutrition educators in assisting these parents in improving their health and the health of their families.

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## LIST OF APPENDICES

## APPENDIX A: SURVEY

## Nutrition Education among Parents

Please place a “✓” in the box that corresponds with your answer.

	Very Important	Important	Somewhat Important	Of Little Importance	Not at all Important
<b>1. How important is it that your child eats healthy?</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>2. How important is it that the meals you provide your child are healthy?</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**3. How often do you receive nutrition information from the following?**

	Frequently	Sometimes	Never	Frequently
<b>Child’s School Lunch Director</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Child’s Teacher</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Nurses</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Nutritionist</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Physicians</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**4. Which source would you prefer to get nutrition information from? Please rank them from 1 to 5 in order of importance, with 1 as most important.**

- \_\_\_ Child’s School Lunch Director
- \_\_\_ Child’s Teacher
- \_\_\_ Nurses
- \_\_\_ Nutritionist
- \_\_\_ Physicians



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**5. How often do you use healthy eating information from the following sources?**

	Very Frequently	Frequently	Sometimes	Rarely	Never
Information sent home with your child from school	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Healthy homework activities sent home with your child from school	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Television shows	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Magazines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Healthy eating resource online websites	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Online meal planner	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tips from friends on Facebook, Twitter, or Pinterest	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mobile phone application (apps)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Online discussion or message boards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Healthy eating or cooking class online	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Healthy eating or cooking class in-person	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Grocery store tours	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Video games	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nutrition facts label on food packaging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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**6. How likely would you use the following healthy eating information sources?**

	Very likely	Likely	Somewhat likely	Rarely	Never
Information sent home with your child from school	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Healthy homework activities sent home with your child from school	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Television shows	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Magazines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Healthy eating resource online websites	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Online meal planner	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tips from friends on Facebook, Twitter, or Pinterest	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mobile phone application (apps)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Online discussion or message boards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Healthy eating or cooking class online	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Healthy eating or cooking class in-person	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Grocery store tours	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Video games	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nutrition facts label on food packaging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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**7. How interested are you in the following healthy eating topics?**

	Very interested	Interested	Somewhat interested	A little interested	Not at all
Meal planning & preparation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tips for overcoming picky eating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Meal portion sizes (how much to eat)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nutrition label education	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Healthy tips for eating out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Healthy grocery shopping tips	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quick meal preparation recipes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low cost recipes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Healthy recipes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low-fat recipes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Tell us a little bit about yourself.**

**1. What is the highest level of education you have completed?**

- |  |  |
|--|--|
| <input type="checkbox"/> Less than High School | <input type="checkbox"/> 2-Year College (Associates)     |
| <input type="checkbox"/> High School/ GED      | <input type="checkbox"/> 4-Year College (Bachelors)      |
| <input type="checkbox"/> Some College          | <input type="checkbox"/> Greater than 4 years of College |

**2. Please select the age group that fits you best.**

- 18 to 24
- 25 to 34
- 35 to 44
- 45 to 54
- 55 to 64
- Over 64

**3. Please select your gender.**

- Male
- Female

**4. How would you describe yourself?**

- American Indian/ Native American
- Asian
- Black/ African American
- Hispanic/Latino
- White/ Caucasian
- Pacific Islander
- Other

Thank you for completing!  
Please return to your child's teacher.

APPENDIX B: IRB APPROVAL

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## IRB Approval of 14x-081

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Ole Miss IRB <irb@olemiss.edu>

Fri, Oct 18, 2013 at 10:43 AM

To: Rachel Scoggins <rjscoggi@go.olemiss.edu>, lambertl@olemiss.edu

Cc: kknight@olemiss.edu

Ms. Scoggins:

This is to inform you that your application to conduct research with human participants, "Parent's Use and Preference for Nutrition Resources in the Mississippi Delta Region" (Protocol #14x-081), has been approved as Exempt under 45 CFR 46.101(b)(#2).

Please remember that all of The University of Mississippi's human participant research activities, regardless of whether the research is subject to federal regulations, must be guided by the ethical principles in The Belmont Report: Ethical Principles and Guidelines for the Protection of Human Subjects of Research.

It is especially important for you to keep these points in mind:

- You must protect the rights and welfare of human research participants.
- Any changes to your approved protocol must be reviewed and approved before initiating those changes.
- You must report promptly to the IRB any injuries or other unanticipated problems involving risks to participants or others.

If you have any questions, please feel free to contact the IRB at [irb@olemiss.edu](mailto:irb@olemiss.edu).

**Jennifer Caldwell, PhD**

**Senior Research Compliance Specialist, Research Integrity and Compliance**

The University of Mississippi

212 Barr

University, MS 38677-1848

U.S.A.

[+1-662-915-5006](tel:+16629155006)

[irb@olemiss.edu](mailto:irb@olemiss.edu) | [www.olemiss.edu](http://www.olemiss.edu)

APPENDIX C: LETTER TO PRINCIPAL

Dear Principal:

I am a graduate student at The University of Mississippi in the Department of Nutrition & Hospitality Management under the supervision of Dr. Lambert. We are surveying parents of elementary school aged-children to identify their uses and preferences for nutrition education resources. It is our hope that the results of my research project will provide valuable feedback from parents to assist in future development of nutrition education programs. We are including parents of children in grades kindergarten through second from three different elementary schools in the Mississippi Delta region and asking for their help in providing there input by completing a survey that will take **approximately 7-10 minutes**.

We are asking for your support and assistance in gathering this information by allowing us to send the surveys home with your students who will give them to their parent/caregiver to complete. We ask that the teachers handout and collect the surveys when brought back to school during the month of October 2013. Results of the survey will be reported collectively from parents of all three schools. All survey data will be entered into an Excel data base. Confidentiality will be maintained and no individual responses will be identifiable. You will receive a copy of the Executive Summary to share with parents once the study is completed.

This study will be reviewed and approved by The University of Mississippi's Institutional Review Board (IRB) prior to parents completing the survey. The IRB is responsible for ensuring that this study fulfills the human research subject protections obligations required by state and federal law and University policies. **For IRB's approval**, we must receive the school principal's approval.

I will call you in a few days to see if you would be interested in supporting us in surveying your student's parents. Your help is critical to the success of the study and greatly appreciated.

Sincerely,



Rachel Scoggins  
Graduate Student  
School of Applied Sciences  
The University of Mississippi  
662-703-0974



Laurel Lambert, PhD, R.D.  
Department of Nutrition and Hospitality  
Management  
School of Applied Sciences  
The University of Mississippi  
662-915-7807

APPENDIX D: LETTER TO TEACHER



Dear Teacher:

We are conducting a survey to collect input from parents and caregivers of elementary-age children regarding their use and preferences of nutrition education resources. The manila envelope you received contains a survey in an envelope for each student in your class plus an additional ten surveys and envelopes in case any student loses his/her survey. You will also find small incentives. These incentives are provided to encourage students to return their survey. Please use the incentives as you see most appropriate.

Please send the surveys home with your students on Monday, October XX and provide instructions for them to have their parent/caregiver complete the survey. Let your students know that if they return the surveys they will be offered a small prize. Your students will have almost two weeks to return the survey. One week prior to the survey deadline, remind students to return their survey. At this point, if any student has lost his/her survey, provide an additional survey. Please place returned surveys back in the large manila envelope and return it to your school's office by (date).

Below is an instructional timeline for distributing the surveys:

1. Monday (date): Provide your students with instructions for giving the survey to their parent/caregiver to complete and send back to you.
2. Monday (date): For those students, who have not returned survey, remind them that surveys should be returned by Thursday (date). Provide extra an survey to any student that loses his/hers.
3. Thursday (date): Place returned surveys in large manila envelope and return to your school's office.

Your help is critical to the success of the study and greatly appreciated. If you have any questions, please feel free to contact us at the numbers listed below.

Sincerely,



Rachel Scoggins  
Graduate Student  
School of Applied Sciences  
The University of Mississippi  
662-703-0974



Laurel Lambert, PhD, R.D.  
School of Applied Sciences  
The University of Mississippi  
662-915-7807

APPENDIX E: LETTER TO PARENT

Dear Parent or Guardian:

I am a graduate student at The University of Mississippi in the Department of Nutrition & Hospitality Management under the supervision of Dr. Lambert. You are invited to participate in a research project entitled: Parents and preferred nutrition education resources (such as handouts, DVDs, classes, books, and internet). We are collecting input from parents and caregivers of elementary school-age children on what type of nutrition education resources they find useful. Your input will provide valuable feedback in assisting the development of future nutrition education programs for parents.

We have been given permission from your Principal (Name) to survey parents of his students. We are asking for your help in providing us information on what type of nutrition education resources you think are valuable and beneficial by completing this survey. It will take **approximately 7-10 minutes**. Once you have completed the survey, place it in the envelope and seal it. Then give the survey to your child to take back to his/her teacher. Each child returning a survey will receive a small prize. Once all surveys are collected from the teachers, they will be analyzed and the results will be reported collectively from parents in all participating schools. Confidentiality will be maintained and no parent's individual answers will be identifiable.

This study has been approved by The University of Mississippi's Institutional Review Board (IRB). The IRB is responsible for ensuring that this study fulfills the human research subject protections obligations required by state and federal law and University policies. There are no identified risks from participating in this research. Participation in this research is voluntary and you may refuse to participate without consequence. Your refusal to participate will involve no penalty to you or your child. If you have any questions, concerns, or reports regarding their rights as a participant of research, please contact the IRB at (662) 915-7482. The principal of your child's school will receive a copy of the Executive Summary to share with you once the study is complete.

Thank you for your consideration. Your help is critical to the success of the study and greatly appreciated.

Sincerely,



Rachel Scoggins  
Graduate Student  
School of Applied Sciences  
The University of Mississippi  
662-703-0974



Laurel Lambert, PhD, R.D.  
School of Applied Sciences  
The University of Mississippi  
662-915-7807

APPENDIX F: TABLE 1

Table 1. Paired t-test of current use and likely use of nutrition education resources (n = 214).

Resource	<i>M</i> ( <i>SD</i> )	<i>t</i>	Sig. (2-tailed)
Information sent home with you child from school			
Currently use	3.00 (1.31)		
Likely to use	4.15 (.94)	-12.60	.00
Healthy homework activities sent home with you child from school			
Currently use	3.18 (1.40)		
Likely to use	4.21 (.95)	-10.43	.00
Television shows			
Currently use	3.24 (1.12)		
Likely to use	3.45 (1.22)	-2.66	.01
Magazines			
Currently use	3.05 (1.11)		
Likely to use	3.31 (1.26)	-3.31	.00
Healthy eating online websites			
Currently use	2.77 (1.28)		
Likely to use	3.11 (1.42)	-4.18	.00
Online meal planner			
Currently use	2.07 (1.15)		
Likely to use	2.95 (1.43)	-9.62	.00
Tips from friends on Facebook, Twitter, or Pinterest			
Currently use	2.41 (1.32)		
Likely to use	2.81 (1.41)	-5.58	.00
Mobile phone applications (apps)			
Currently use	2.10 (1.24)		
Likely to use	2.69 (1.42)	-7.17	.00
Online discussion or message boards			
Currently use	1.75 (1.01)		
Likely to use	2.47 (1.34)	-9.20	.00
Healthy eating or cooking class online			
Currently use	1.84 (1.06)		
Likely to use	2.76 (1.49)	-10.42	.00
Healthy eating or cooking class in-person			
Currently use	1.76 (1.03)		
Likely to use	3.05 (1.51)	-12.35	.00
Grocery store tours			
Currently use	2.49 (1.47)		
Likely to use	3.25 (1.52)	-8.43	.00
Video games			
Currently use	1.49 (.87)		
Likely to use	1.95 (1.31)	-6.02	.00
Nutrition facts label on food packaging			
Currently use	3.58 (1.31)		
Likely to use	4.03 (1.27)	-5.52	.00

APPENDIX G: TABLE 2

Table 2. Demographic characteristics of participating parents (N=214), Mississippi Delta region.

Demographic characteristic	N (%)
<i>Education</i>	
Less than high school	9 (4.2)
High school or GED	61 (28.5)
Some college	66 (30.8)
2-year college	39 (18.2)
4-year college	19 (8.9)
Greater than 4 years of college	20 (9.3)
<i>Age</i>	
18 -24	19 (8.9)
25-34	127 (59.3)
35-44	40 (18.7)
45-54	20 (9.3)
55-64	8 (3.7)
Over 64	0
<i>Gender</i>	
Male	17 (7.9)
Female	197 (92.1)
<i>Ethnicity</i>	
Native American	3 (1.4)
Asian	1 (.5)
African American	188 (87.9)
Hispanic	2 (.9)
Caucasian	16 (7.5)
Pacific Islander	2 (.9)
Other	2 (.9)

## VITA

### **RACHEL J. SCOGGINS**

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778 Leslie Road • Pope, MS 38658 • (662) 703-0974 • [racheljcampbell@gmail.com](mailto:racheljcampbell@gmail.com)

### **EDUCATION**

#### **The University of Mississippi Oxford, MS**

*Master of Science in Food and Nutrition Services* May 2014

*Bachelor of Science in Dietetics and Nutrition* May 2012

### **DIETETIC INTERNSHIP**

#### **The University of Mississippi Oxford, MS**

*ACEND Coordinated Program in Dietetics* May 2014

- 1370 hours of supervised practice in the following areas: medical nutrition therapy emphasizing renal nutrition, nutrition support, diabetes outpatient counseling and long-term patient care, administrative food services, community nutrition emphasizing the Women, Infant, and Children (WIC) program, child nutrition, and long-term care of intellectually disabled individuals

### **EXPERIENCE**

#### **The University of Mississippi, Department of Nutrition and Hospitality Management Oxford, MS**

*Administrative Graduate Assistant* 2012-2013

### **MEMBERSHIPS**

- Academy of Nutrition and Dietetics, Member 2010-present
- Student Dietetic Association, Member 2010-present
- President of The University of Mississippi Chapter of Alpha Lambda Delta 2012-2013
- Student Member of The University of Mississippi Chapter of Alpha Lambda Delta, 2011-present