

# Parent's Use and Likely Utilization of Nutrition Education Resources in the Mississippi Delta Region

Rachel Scoggins,<sup>1\*</sup> Laurel Lambert,<sup>2</sup> and Kathy Knight<sup>2</sup>

<sup>1</sup>Magnolia Regional Health Center, Corinth, Mississippi

<sup>2</sup>The University of Mississippi, Mississippi, United States

\*Corresponding author: Rachel Scoggins, Magnolia Regional Health Center, 611 Alcorn Drive, MS 38834, Corinth, Mississippi. Tel: +662-2931194, E-mail: racheljcampbell@gmail.com

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## Abstract

**Background:** Parental involvement has been identified as one of the most important factors affecting children's health. There has been limited investigation on nutrition education resources preferred by parents living in the Mississippi Delta, a region of the state with the highest rates for poverty and diet-related diseases. Understanding what type of nutrition education resources are currently used by parents and what type of resources parents would likely use, if made available, will be beneficial to health educators in developing and disseminating nutrition education resources and facilitate the greatest impact.

**Objective:** Identifying nutrition education resources used by parents.

**Patients and Methods:** Low-income parents of elementary school-aged children were surveyed on their 'current use' and 'likely use' of nutrition education resources. Survey packets were delivered to teachers in three elementary schools who then distributed the surveys to their students to deliver to their parents. Completed surveys were returned to the teacher who delivered them to the researchers. Descriptive statistics were used to summarize responses.

**Results:** The most common nutrition education resources currently used by parents are nutrition facts labels ( $m = 3.58 \pm SD 1.31$ ), television shows ( $m = 3.24 \pm SD 1.12$ ), and healthy homework activities from their child's school ( $m = 3.18 \pm SD 1.40$ ). Resources seldom used by parents are video games ( $m = 1.49 \pm SD 0.87$ ), healthy cooking classes ( $m = 1.76 \pm SD 1.03$ ), and online discussion boards ( $m = 1.75 \pm SD 1.01$ ). The nutrition education resources parents would likely use are healthy homework activities ( $m = 4.21 \pm SD .95$ ) and information sent home from school ( $m = 4.15 \pm SD 0.94$ ). Parents reported they would least likely use video games ( $m = 1.95 \pm SD 1.31$ ), online discussion boards ( $m = 2.47 \pm SD 1.34$ ), and mobile phone applications ( $m = 2.69 \pm SD 1.42$ ).

**Conclusions:** Identifying nutrition education resources currently being used and most likely to be used by parents will be beneficial to health educators when developing and implementing effective nutrition interventions with parents in the Mississippi Delta and other rural regions.

**Keywords:** Low-Income Population, Parents, Education, Nutrition Survey

## 1. Background

The residents of the Mississippi Delta (Delta), a geographical region in Mississippi, have the highest rates in the nation for diet-related diseases such as obesity, hypertension, and diabetes (1). This region also has the highest poverty rate in the state (2). Researchers reported that 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 (3). Food insecurity, defined as lack of consistent access to nutritional and adequate food obtained in socially acceptable ways (4), has been linked to poor diet quality and childhood obesity (5), diet quality of families living in the Delta is of concern because foods available within the home impact children's eating habits (3).

The home food environment is created through in-

teraction between the parent, the child, and food within the home. The food environment and meals prepared for the family are influenced by the parent's nutrition knowledge, food preferences, finances, and time constraints (6, 7). With nutrition knowledge and self-efficacy to prepare healthful meals, parents are able to provide a healthier food environment (7). Research has shown that lack of health knowledge and financial barriers negatively impact the degree to which parents are involved in their child's healthy eating (8, 9). The Delta population has been identified as having low health literacy, creating a challenging environment which disseminates health and nutrition related information (10).

Zoellner et al. found that television, newspapers, magazines, and internet were effective methods for delivering nutrition information to adults, living in the Delta (10). However, they trusted information obtained from television more than from the internet. As a healthcare provider,

physicians were also seen as a trusted source of health information (10). In fact, health care providers (physicians, nutritionists, and nurses) have been shown to be effective mediators of health information by either directly providing information or implementing educational programs for health improvement among diverse populations (11-15).

The school system can also serve as a mediator in delivering nutrition education resources to parents. The Healthy, Hunger-Free Kids Act of 2010 (16) requires all schools participating in federal meal programs to have a school wellness policy in place. This policy requires nutrition education components that should involve students, teachers, and parents (16). Nutrition education programs targeting parents have yielded positive results. Although there has been limited investigation on nutrition education resources and delivery modes preferred by parents in the Delta (10), school-based programs with a family component have shown improved healthy lifestyle in parents and their children (17, 18).

## 2. Objectives

Understanding what type of nutrition education resources are currently used by parents and what type of resources parents would likely use, if made available, will be beneficial to health educators in developing and disseminating nutrition education resources and facilitate the greatest impact.

## 3. Patients and Methods

Parents or guardians of students in grades kindergarten through 2nd were solicited from a convenient sample of three public elementary schools in three Delta counties. All three schools in the sample reported 98% or greater student eligibility for free and reduced-price meals, allowing researchers access to a low-income parent population. This study was approved by the institutional review board at the researchers' affiliated institution.

A survey was used to collect data on low-income parents' 'current use' and 'likely use,' if made available, of nutrition education resources. Survey questions were developed through a literature review and with the assistance of experts in the fields of nutrition and education, who evaluated the survey for clarity and inclusiveness. The pilot survey was then given to six parents of elementary school children who also evaluated the survey for clarity of instruction, readability, terminology, and content of items.

The survey included two items addressing importance to the parent of their child eating healthy and current and likely use of 14 different nutrition education resources

(Table 1) using a 5-point Likert-type scale from 5 (very important) to 1 (not at all important). The next section addressed how often parents received nutrition education resources from five mediators (school nutrition directors, teachers, nurses, nutritionists, and physicians), using a 3-point Likert-type scale from 3 (frequently) to 1 (never). Parents were also asked which mediator they would prefer, using a ranking system of 1 (most preferred) to 5 (least preferred). The third section solicited demographic information: education, age, gender, and race. Internal reliability scales were  $\alpha = 0.85$  (currently used nutrition education resources) and  $\alpha = 0.93$  (likely to be used nutrition education resources) which are in the ranges of acceptable internal consistency ( $\alpha \geq 0.7$ ) (19).

In October 2013, survey packets were delivered to teachers in grades kindergarten through 2nd in all three participating schools. Packets included instructions for survey distribution, parent surveys, and small toys as incentives for students whose parents completed the survey. The teachers distributed surveys to their students to deliver to their parents who were then given 10 days to complete and return surveys to the teacher who delivered them to the researchers. The method design has been shown to be reliable when surveying parents of elementary school children (20).

Descriptive statistics of means, standard deviations, and frequencies were used to summarize responses. Paired t-tests were used to identify significant differences between current use and likely use of nutrition education resources for the 14 items. An ANOVA and LSD post-hoc tests were conducted to evaluate how parent responses for current use and likely use of nutrition education resources varied by education, age, gender, and race. All statistical analyses were performed using SPSS version 21 (SPSS Inc., Chicago, IL, 2012).

## 4. Results

A total of 319 of 586 (54%) parents returned the surveys. Due to incomplete responses, 105 surveys were excluded, resulting in 214 of 586 (37%) surveys used for analyses (Table 2). The majority of parents were African American (88%), female (92%), and ages 25 to 34 (59%), with high school/GED (29%), some college education (31%), and 2-year college degrees (18%).

### 4.1. Importance of Healthy Eating and Mediators

The majority of parents (92%) responded that it is very important that their child eats healthy and 87% responded that they do provide healthy meals to their children. Parents stated that they presently receive nutrition

information “sometimes” to “frequently” from a physician (70%), a nutritionist (55%), a nurse (49%), their child’s school nutrition director (43%), and their child’s teacher (40%). However, 53% of parents ranked nutritionists as the most preferred choice for receiving nutrition information, with physicians ranked as the second preferred (32%), and school nutrition director ranked as third (24%). The nurse and child’s teacher were fourth and fifth at 12% and 7%, respectively. Percentages total greater than 100% due to some parents ranking more than one mediator which they preferred.

#### 4.2. Current Use and Likely Use of Nutrition Education Resources

The nutrition education resources that parents most frequently use are nutrition facts labels ( $m = 3.58 \pm SD 1.31$ ), television shows ( $m = 3.24 \pm SD 1.12$ ), and healthy homework activities from their child’s school ( $m = 3.18 \pm SD 1.40$ ), (Table 1). Resources seldom or rarely used by parents are video games ( $m = 1.49 \pm 0.87$ ), in-person healthy cooking classes ( $m = 1.76 \pm SD 1.03$ ), and online discussion boards ( $m = 1.75 \pm SD 1.01$ ).

The nutrition education resources parents would most likely use are healthy homework activities ( $m = 4.21 \pm SD .95$ ) and other healthy eating information sent home from school ( $m = 4.15 \pm 0.94$ ), and nutrition facts labels ( $m = 4.03 \pm SD 1.27$ ). Parents reported they would least likely use video games ( $m = 1.95 \pm SD 1.31$ ), online discussion boards ( $m = 2.47 \pm SD 1.34$ ), and mobile phone applications ( $m = 2.69 \pm SD 1.42$ ).

Paired t-tests showed positive statistical differences ( $P \leq 0.01$ ) between the current use and likely use of the 14 nutrition education resources (Table 1). An ANOVA indicated statistical significance between education level for current use of healthy eating websites,  $F(5, 208) = 3.46$ ,  $P < 0.01$ , and healthy eating tips from friends on Facebook, Twitter, or Pinterest (social media),  $F(5, 208) = 2.93$ ,  $P = 0.01$ . The LSD post-hoc tests are shown in Table 3.

## 5. Discussion

### 5.1. Importance of Healthy Eating and Mediators

Consistent with two previous studies (9, 21), parents in this study believe healthy eating within the context of their family environment is important and show interest in nutrition and healthy eating for their children. Parents also reported that physicians are the primary mediator for delivering nutrition information which supports previous research in which physicians and other health care providers were found to be the most trusted resource to receive nutrition-related information among television,

family and friends, magazine, newspaper, radio, and internet (10).

Nutritionists were identified by parents as the second most common source for receiving nutrition information. In 2014, there were 87,937 participants in the Mississippi women, infants, and children (WIC) supplemental food program, whose charge was to provide nutrition counseling. It may be likely that parents in this study received nutrition information from nutritionists with this program (22). This study did not determine if parents were WIC participants, the extent of interaction with nutritionists, or the type of information received from a nutritionist.

Another nutrition assistance program available to low-income families is the supplemental nutrition assistance program (SNAP). The congressional district encompassing the Delta had 63,925 households receiving SNAP benefits according to 2015 SNAP participation report (23). Parents not participating in WIC could be supplied with nutrition education through SNAP.

The third preferred mediator was school nutrition directors. While this study did not obtain educational backgrounds, it has been shown that schools having directors who are also nutritionists increases the likelihood of their participation in federal nutrition initiatives (24). School nutrition directors can be valuable mediators in sending nutrition information home with students such as monthly menus, healthy eating suggestions, and food preparation tips. Directors have reported a lack of nutrition education resources for parents (25). However, websites such as Team Nutrition are valuable resources for nutrition education materials (26).

Only 7% of parents identified their child’s teacher as a preferred mediator. However, parents reported nutrition information and activities sent home from school as frequently used resources. In this context, these resources are provided by another mediator or it is likely that parents are not making the connection between the teacher and nutrition information. Previous research findings have determined that connecting with parents and involving them in school-related nutrition education programs is successful in improving diet quality among families (27, 28).

### 5.2. Current Use and Likely Use of Nutrition Education Resources

The top nutrition education resources currently used by Delta parents are nutrition facts labels, television, and homework activities (Table 1). Katz et al. showed that homework on how to read food labels increased parents’ nutrition label reading literacy (27, 28).

This study did not establish the subject matter of the nutrition education resources currently used by parents,

so it cannot be ascertained if parents have received information on reading nutrition facts labels from their child's school. Previous research has found that parents with higher nutrition knowledge are more likely to use nutrition facts labels (29). While 60% of parents in this study had greater education than high school level, the extent of their nutrition knowledge was not measured. However, it has been reported that the Delta population has low health knowledge (10).

Television shows were the second most frequent nutrition education resource currently being used by parents. Previous findings showed that the Delta adult population trusted television as a health education resource (10). With numerous food and cooking television channels available it is not surprising that this would be a popular resource. Further research is necessary to determine the credibility of nutrition information made available through television.

Healthy homework activities and information sent home from school were among the top five resources currently being used and likely to be used by parents. Health-related activities completed as homework, premised on parent-child cooperation, has been effective in improving children's health (17). Homework aimed at improving the home health environment may be advantageous, especially if parents are already receptive to these resources.

It has been reported that low-income populations use internet accessed sites such as discussions boards for seeking health information (30). Also, use of social networking sites was found to be successful in recruiting low-income women for nutrition education (31). However, in this study, three of the five least used, and four of the five least likely to be used nutrition education resources, required internet or wireless access. Parents living in the Delta may lack access or means to use online resources. While online resources have been successfully used for improving nutrition knowledge and behavior (20, 32) and cited as an acceptable alternative to traditional education programs (33), this study showed that online nutrition education resources may not be suitable or well received by parents in the Delta.

Mobile phone applications (apps) were not likely to be used by parents as a source of nutrition information in this study. Although, apps have been viewed as an acceptable education tool (34), researchers have identified that nutrition education apps were not reliable sources of accurate information (35). It is necessary to ensure mobile apps is a valid and reliable information to be used by nutrition educators.

Parents reported that currently they rarely or seldom use in-person healthy cooking classes (mean = 1.8, SD ± 1.0). However, it appears that parents may want to have

this resource (mean = 3.1, SD ± 1.5). In-person healthy cooking classes could be a welcomed opportunity for nutritionists or school nutrition directors to interact with parents with the goal of increasing healthy eating in the family. Successful participation may be dependent on providing child care during classes and means of transportation in this parent population (36).

Currently, video games are the least used and the least likely to be used nutrition education resource by parents. This may be unfortunate since nutrition education video games have been shown to positively change diet behavior and are adaptable to diverse populations (32).

As limitations, this study addressed the use of nutrition education resources by a small convenient sample of parents living in counties located in the northern half of the Mississippi Delta region. These results may not reflect other areas of the Delta 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. Another challenge was percentage rate of returned surveys. Due to incomplete surveys many had to be excluded from analysis. This could be due to survey length, unclear instructions, or lack of importance placed on completing the survey and may have resulted in selection bias.

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 (10, 33), 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. Schools can be a tremendous conduit in communicating with all parents of elementary school children in efforts to deliver nutrition education information.

Second to physicians, parents most often receive their nutrition education from nutritionists, who were identified as the preferred mediator. Access to specialty health-care professionals is oftentimes limited in rural areas (37). This is especially true with nutritionists, who are prevented from seeking employment in these regions due to financial and job opportunity barriers (38). Since relationships between nutritionists and parents have been established, additional routes should be explored where nutritionists can make contact with this population.

An unexpected finding was that parents identified teachers as the least preferred mediators who provide little nutrition information. However, they reported frequently using healthy homework activities sent home from their

**Table 1.** Paired T-Test of Current Use and Likely Use of Nutrition Education Resources (n = 214)

Resource	Values <sup>a</sup>	t	P Value
<b>Information sent home with your child from school</b>		12.60	.00
Currently use	3.00 (1.31)		
Likely to use	4.15 (0.94)		
<b>Healthy homework activities sent home with your child from school</b>		-0.43	.00
Currently use	3.18 (1.40)		
Likely to use	4.21 (.95)		
<b>Television shows</b>		-2.66	.01
Currently use	3.24 (1.12)		
Likely to use	3.45 (1.22)		
<b>Magazines</b>		-3.31	.00
Currently use	3.05 (1.11)		
Likely to use	3.31 (1.26)		
<b>Healthy eating online websites</b>		-4.18	.00
Currently use	2.77 (1.28)		
Likely to use	3.11 (1.42)		
<b>Online meal planner</b>		-9.62	.00
Currently use	2.07 (1.15)		
Likely to use	2.95 (1.43)		
<b>Tips from friends on Facebook, Twitter, or Pinterest</b>		-5.58	.00
Currently use	2.41 (1.32)		
Likely to use	2.81 (1.41)		
<b>Mobile phone applications (apps)</b>		-7.17	.00
Currently use	2.10 (1.24)		
Likely to use	2.69 (1.42)		
<b>Online discussion or message boards</b>		-9.20	.00
Currently use	1.75 (1.01)		
Likely to use	2.47 (1.34)		
<b>Healthy eating or cooking class online</b>		10.42	.00
Currently use	1.84 (1.06)		
Likely to use	2.76 (1.49)		
<b>Healthy eating or cooking class in-person</b>		12.35	.00
Currently use	1.76 (1.03)		
Likely to use	3.05 (1.51)		
<b>Grocery store tours</b>		-8.43	.00
Currently use	2.49 (1.47)		
Likely to use	3.25 (1.52)		
<b>Video games</b>		-6.02	.00
Currently use	1.49 (0.87)		
Likely to use	1.95 (1.31)		
<b>Nutrition facts label on food packaging</b>		-5.52	.00
Currently use	3.58 (1.31)		
Likely to use	4.03 (1.27)		

<sup>a</sup> Values are presented as mean (SD).

**Table 2.** Demographic Characteristics of Participating Parents (N = 214), Mississippi Delta Region

Demographic Characteristics	Values <sup>a</sup>
<b>Education</b>	
Less than high school	9 (4.2)
High school or GED	61 (28.5)
Some college	66 (30.8)
2-year associate degree	39 (18.2)
4-year bachelor's degree	19 (8.9)
Greater than bachelor's degree	20 (9.3)
<b>Age, y</b>	
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
<b>Gender</b>	
Male	17 (7.9)
Female	197 (92.1)
<b>Ethnicity</b>	
Native American	3 (1.4)
Asian	1 (0.5)
African American	188 (87.9)
Hispanic	2 (0.9)
Caucasian	16 (7.5)
Pacific Islander	2 (0.9)
Other	2 (0.9)

<sup>a</sup> Data are presented as No. (%).

child's school. The role of teachers as main mediators in communicating health messages needs to be further explored because of their role in creating positive relationships with parents and affecting parental involvement with the school environment (39).

School nutrition directors, the third preferred mediator, can serve as a tremendous resource of nutrition education materials for parents. Because of their role in the management of federally supported meal programs they are more likely aware of nutrition education resources accessed through various government sites. It would be worthwhile to investigate how school nutrition directors could establish a stronger relationship with parents in efforts to maximize their influence as a preferred mediator.



**Table 3.** Analysis of variance Between Currently Used Nutrition Education Resources and Educational Level<sup>a</sup>

Nutrition Education Resource	Less Than High School	High School or GED	Some College	Two Year Associate Degree	Four year Bachelor's Degree	Greater Than Bachelor's Degree
Healthy eating online resources	2.56 ± 1.74	2.28 ± 1.20 <sup>b</sup>	2.93 ± 1.21 <sup>b</sup>	2.98 ± 1.14 <sup>b</sup>	2.74 ± 1.28	3.40 ± 1.35 <sup>b</sup>
Tips from friends on Facebook, Twitter, or Pinterest	2.11 ± 1.05	2.07 ± 1.33 <sup>b</sup>	2.63 ± 1.27 <sup>b</sup>	2.64 ± 1.37 <sup>b</sup>	1.84 ± 0.89	2.90 ± 1.48 <sup>b</sup>

<sup>a</sup> Data are presented as mean ± SD.

<sup>b</sup> Significantly different ( $P < 0.05$ ).

These efforts should also be made in collaboration with teachers and other school professionals to send a consistent message.

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 for their children. The findings of this study will be valuable to nutrition educators who help parents improve their health and the health of their families.

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### Footnote

**Authors' Contribution:** Rachel Scoggins developed the study concept and design. Acquisition of data was provided by Rachel Scoggins and Laurel Lambert. Drafting and critical revision of the manuscript and statistical analysis are provided by Rachel Scoggins, Laurel Lambert, and Kathy Knight; material support is provided by Kathy Knight. In addition, this study was supervised by Laurel Lambert.

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