Exploring health literacy as a factor contributing to adoption of the 2005 Dietary Guidelines among adults in the Mississippi Delta

FINAL REPORT

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PROJECT SUMMARY

Nutrition literacy may be defined as “the capacity to obtain, process, and understand basic nutrition information needed to make appropriate dietary decisions.” This study combined quantitative and qualitative research methodologies to explore nutrition literacy as a mediating factor contributing or inhibiting adoption of the 2005 Dietary Guidelines among adult Mississippi Delta residents. The conceptual model is illustrated below.

**Relationship between nutrition literacy and adoption of the 2005 Dietary Guidelines**

1. To describe the capacity to obtain basic nutrition information
   a. To describe awareness of the 2005 Dietary Guidelines/MyPyramid
   b. To describe predominant patterns of media exposure
   c. To describe type and level of exposure to nutrition and health information

2. To describe the capacity to process and understand basic nutrition information

3. To determine the relationship between capacity to process and understand and adoption of the 2005 Dietary Guidelines as assessed with a food frequency questionnaire.

4. To explore media and communication channels and culturally appropriate nutrition messages that may be used to promote the 2005 Dietary Guidelines/MyPyramid recommendations.

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1National Cancer Institute (NCI) Health Information National Trends Survey (HINTS) 2
2Newest Vital Sign (NVS)
3Delta Nutrition Intervention Research Initiative (DNIRI) Food Frequency Questionnaire (FFQ)
The results of objectives 1 and 2 are detailed in manuscript #1 which is currently under review at *Preventing Chronic Disease*. Manuscript #2 details the findings related to objective 4 and is currently under review the *Journal of Nutrition Education and Behavior*. Related to objective 3, this study did not identify any significant relationships between **capacity to process and understand** basic nutrition information (Newest Vital Sign score) and adoption of the 2005 *Dietary Guidelines* (dietary variables assessed with a food frequency questionnaire).

**MANUSCRIPT #1**

Seeking and trust of nutrition information is associated with nutrition literacy status among adults in the Lower Mississippi Delta

Submitted 1/08 for peer review at *Preventing Chronic Disease*

**MANUSCRIPT #2**

Meaningful messages: Adults in the Lower Mississippi Delta provide cultural insight into strategies for promoting the MyPyramid

Submitted 10/07 for peer review at *Journal of Nutrition Education and Behavior*
Seeking and trust of nutrition information is associated with nutrition literacy status among adults in the Lower Mississippi Delta
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Abstract

Introduction: The objective of this cross-sectional study was to describe the nutrition literacy status among adults in the Lower Mississippi Delta region.

Methods: Survey instruments included the Newest Vital Sign and an adapted version of the Health Information National Trends Survey. A proportional quota sampling plan was used to represent educational achievement of residents in the Delta region. Participants included 177 adults, primarily African Americans (81%). Descriptive statistics, Chi-square and ANOVA tests were used to examine survey data.

Results: Results indicated 24% of participants had a high likelihood of limited nutrition literacy skills, 28% had a possibility of limited nutrition literacy skills, and 48% had adequate nutrition literacy skills. Overall, the Internet was the least trusted and least used source for seeking nutrition information. Participants in lower nutrition literacy categories identified more barriers and less confidence in seeking information about nutrition, as compared to those in higher nutrition literacy categories. Only 12% of participants correctly identified the 2005 MyPyramid graphic, and the majority (78%) rated their dietary knowledge as poor or fair.

Conclusion: Rates of limited health literacy among Delta adults were high compared to other national surveys. Relying on the Internet as a central mode of health communication may only be widening the health disparity gap among impoverished rural regions similar to the Delta. If we intend to reduce the burden of nutrition-related chronic diseases and communicate scientifically-based nutrition information to rural, disadvantaged communities, we must understand the causes and consequences of limited nutrition literacy.
Introduction

Health literacy is defined as the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions[1]. Poor health literacy is recognized as a significant threat to health and disease prevention. Therefore, improving health literacy skills are a national Healthy People 2010 objective. Considering the increasing rates of nutrition-related chronic diseases and recent release of the 2005 Dietary Guidelines for Americans[2] and MyPyramid (Food Guidance System)[3], there is an important need to understand and promote health literacy within the context of nutrition. Nutrition literacy may be defined as the degree to which individuals have the capacity to obtain, process, and understand basic nutrition information needed to make appropriate dietary decisions.

It is especially important to investigate nutrition literacy in areas experiencing education, health, and nutrition disparities, such as the Lower Mississippi Delta (Delta) region. The Delta region is predominantly rural with a high concentration of African Americans, high rates of poverty, and low educational achievement[4]. Residents in the Delta suffer a disproportionate amount of chronic diseases including obesity, heart disease, diabetes, and hypertension; and have poorer adherence to Dietary Guideline recommendations when compared to the U.S. population[5-8]. Although these disparities are well documented, no known published research has examined the health or nutrition literacy status of residents in the Delta.
The overall goal of this cross-sectional descriptive study was to explore the nutrition literacy status among adults in the Delta. Since the 2005 Dietary Guidelines, MyPyramid, and Nutrition Facts Panel are the cornerstones to adopting nutrition recommendations, these resources served as integral components in this nutrition literacy research. The first objective of this research was to investigate Delta adult residents’ capacity to obtain nutrition information which included their level of awareness and perceived knowledge of the 2005 Dietary Guidelines and MyPyramid, and their use and trust of nutrition communication channels. The second objective was to examine their nutrition literacy, which was defined as capacity to process and understand basic nutrition information on the Nutrition Facts Panel.

Methods

Survey Instruments

In order to describe the capacity to obtain basic nutrition information, we developed four questions to understand awareness and exposure to the 2005 Dietary Guidelines and MyPyramid.

In addition, the Health Communication section of the National Cancer Institute (NCI) Health Information National Trends Survey 2 (HINTS 2) was adapted to reflect exposure to nutrition and health information[9, 10]. The HINTS was originally developed to understand how adults use different communication channels to obtain health information, and has been widely used to characterize cancer knowledge and awareness, trusted sources of cancer information, and preferences for cancer information[11-15]. For this research, one of the most notable adaptations to HINTS 2 was revising the reference to “cancer” and/or “health” to reflect “nutrition, food or diet”. Content validity of the developed and adapted questions were
established by an expert panel including one doctoral level health communication researcher and three doctoral level Registered Dietitians. The expert panel gave feedback on the survey’s content, clarity, and cognitive complexity. The instrument then underwent two rounds of cognitive interviewing with nine participants using concurrent, structured, verbal probing techniques[16]. Appropriate changes were made. The instrument was then pilot tested in a sample of 21 Delta residents, using retrospective, structured verbal probing techniques[16]. This pilot testing resulted in minor changes to the wording of a few questions.

The capacity to process and understand nutrition information was measured with the previously developed and validated Newest Vital Sign (NVS)[17]. The NVS involves having patients view information on a nutrition information label and then answer six questions about how they would interpret and act on the information contained on the label. The number of correct responses is summed to produce a nutrition literacy score ranging from 0-6. Zero or one correct answers indicates a high likelihood of limited literacy, 2-3 correct answers indicates the possibility of limited literacy, and virtually all individuals with scores 4-6 have adequate literacy skills. Validation results indicate that this instrument has good reliability, sensitivity, and accuracy for detecting limited literacy[17].

Data Collection

This research was approved by The University of Southern Mississippi’s Institutional Review Board. The target population for this cross-sectional descriptive study was adults residing in six Mississippi Delta counties. In the context of this health literacy research, it was important to achieve an accurate representation of education levels within these six counties to provide
assurance that the results were generalizable. Therefore, a proportional quota sampling plan based on the 2000 U.S. Census Data education levels was used [4]. Education achievement data for the six counties were averaged to determine percent population estimated in six education strata. The resulting proportional quota sampling plan included 1) 17% of participants with less than a 9th grade education, 2) 22% of participants with a 9th -12th grade education, 3) 26% of participants with a high school diploma or equivalent, 4) 17% of participants with some college – no degree, 5) 14% of participants with an associate’s or bachelor’s degree, and 6) 5% of participants with some graduate school.

Community Health Advisors as Research Partners (CHARPs) were trained to recruit subjects from their communities according to the sampling plan and to collect data. CHARPs are community members who have completed training on cancer awareness provided by the Deep South Network for Cancer Control (a National Cancer Institute-funded project), and who have successfully helped recruit subjects and/or collect data for several research projects in the Delta [18, 19]. For this nutrition literacy research, the CHARPs were required to attend a two-day training session. On the second day, each CHARP was required to pass a certification session whereby the investigators observed them completing a survey with a mock participant. Five CHARPs completed the training, passed the certification, and collected data for this study. The researchers continuously monitored data quality throughout the study. Data collection occurred at locations convenient to the participants including the participants’ home or office, the CHARPs’ home, libraries, and community centers. Participants were given a $25 gift card to compensate their time.
Data Analysis

Descriptive statistics including means, standard deviations and frequencies were used to summarize all responses. The associations of demographic characteristics (gender, race, age, income level, and education level) with survey responses were evaluated using Chi-square and one-way ANOVA tests. Chi-square and ANOVA tests were also used to examine the relationships between nutrition literacy and survey responses. Statistical significance is reported at p < 0.05. All statistical analyses were performed using SPSS version 15.0.

Results

The gender, race, age, income levels, education levels, body mass index, and nutrition literacy scores of the 177 participants are described in Table 1. The majority of participants were African American (81%) females (70%). As indicated by education levels, the proportional quota sampling plan was sufficiently achieved. Furthermore, the distribution of age ranges is well represented. Body Mass Index (BMI), calculated using self-reported height and weight, revealed that 82% of the participants were categorized as overweight or obese. Nutrition literacy scores varied significantly by income level and educational achievement, but not by race, gender, age, or body mass index.

When categorizing nutrition literacy according to developed NVS scoring procedures, scores indicated that 42 (24%) participants had a high likelihood of limited literacy skills (0-1 correct answers), 50 (28%) had a possibility of limited literacy skills (2-3 correct answers), and 85 (48%) had adequate literacy skills (4-6 correct answers). As illustrated in Table 2, several
significant differences were revealed when examining the relationship among nutrition literacy categories and participants’ use of communication channels both for general purposes and for obtaining information related to nutrition, food, or diet. When general use of media channels was examined, overall hours per week spent viewing television (27.8 ± 16.5 hours/week) was nearly twice as high as hours spent listening to the radio (15.6 ± 15.2 hours/week) and over four times higher than hours spent on the Internet (6.5 ± 9.9 hours/week). On average participants reported reading the newspaper 2.9 (SD=2.5) days/week. Participants in the lowest nutrition literacy category reported significantly more hours of television viewing for general purposes compared to the other two groups. Subsequently, participants were asked to report which media channels they had used in the past 12 months to obtain nutrition, food or diet information. Overall, the most frequently confirmed media channel for nutrition information was the television (57%) followed by newspapers or magazines (50%). Only 20% confirmed using the Internet to obtain nutrition information. There was a significant linear-by-linear association for each media channel, indicating that as nutrition literacy skills increase use of media channels for nutrition information also increases. When respondents were asked to report frequency of media use for nutrition information, television was used the most overall (1.9 ± 2.4 times/month), followed by newspapers or magazines (1.4 ± 2.1 times/month), and then the Internet (0.5 ± 1.54 times/month). Participants with high likelihood of limited literacy used the television and newspaper or magazines less frequently compared to those with adequate literacy skills. When examining demographic effects on use of media channels, the only significant (p<0.001) difference was that adults aged 61 years of age or older used the Internet less frequently than all other age groups.
Table 3 illustrates trust in sources of nutrition information, confidence in obtaining nutrition information, and barriers to seeking nutrition information. Overall, participants trusted information from doctor or health care providers and the television the most, and Internet the least. There were also significant differences among nutrition literacy categories whereby those in the lowest two nutrition literacy categories had lower trust in magazines and newspaper as compared to those with adequate nutrition literacy skills, and those in the lowest nutrition literacy category had lower trust in radio and Internet as compared to those with adequate literacy skills. However there were no trust differences among nutrition literacy categories for trust in health care providers, television, and family or friends. Confidence in obtaining nutrition information or advice about nutrition, food, or diet was rated significantly lower by the lowest as compared to the highest nutrition literacy category. Of the four questions related to barriers to seeking nutrition information, two of the barriers including effort and frustration were rated higher for the lowest two nutrition literacy categorizes as compared to those with adequate nutrition literacy skills.

When respondents were asked if they were aware that the government had released new Dietary Guidelines in 2005, 76% of the participants indicated they were not aware. When asked to identify the most recent picture promoted by the Dietary Guidelines, only 22 (12%) correctly identified the MyPyramid graphic. Most participants (46%) selected the 1994 Food Guide Pyramid graphic, followed by the Four Basic Food Groups graphic (23%), and Canadian Food Guide graphic (9%). When asked to rate their knowledge of the 2005 Dietary Guidelines on a 5-point Likert scale (with 1 = poor, and 5 = very good) the average was 1.8 ± 1.0 with the majority perceiving their knowledge as poor (53%) or fair (25%). Cumulatively, only 7% of participants
perceived their knowledge to be good or very good. None of these survey responses differed by demographic characteristics. However, participants with adequate literacy score rated their knowledge of the 2005 Dietary Guidelines significantly (p=0.02) higher (2.0 ± 1.0) compared to those with a high likelihood of limited literacy (1.6 ± 1.0) and possibility of limited literacy skills (1.5 ± 0.9). Of the 22 respondents who correctly identified the MyPyramid graphic, 13 had adequate nutrition literacy, 6 had possibility of limited nutrition literacy skills, and 3 had high likelihood of limited nutrition literacy skills.

Discussion/Conclusion

Although the education and health disparities in the Delta region are well documented, no other published studies have directly examined the health or nutrition literacy status of residents in the Delta region [6, 7, 20]. It was important to determine that the majority (52%) of participants had a high likelihood of or a possibility of limited literacy skills, as this finding helps establish the scope of health literacy among adults in the Delta region. The proportional sampling of educational achievement and adequate distribution of ages provides reasonable assurance that these nutrition literacy findings are generalizable to the greater Delta region. Although, Healthy People 2010 established the objective to improve the health literacy of persons with inadequate or marginal literacy skills, this is a developmental objective and therefore baseline data and targets have not been established[1].

The National Assessment of Adult Literacy (NAAL) recently released the first large scale study of health literacy among approximately 19,000 US adults[21]. The comprehensive assessment
examined prose, document and quantitative health literacy across three domains of health and health care information and services including clinical, prevention, and navigation of the health system. Analyses were weighted to represent the total US population. Results indicate that 12% of US adults have proficient health literacy, 53% have intermediate health literacy, 22% have basic health literacy, and 14% have below basic health literacy. Due to methodological differences in assessing and scoring health literacy, a precise comparison between the NAAL health literacy findings and our findings are somewhat difficult. However, based on the definitions and key abilities associated with each level in both assessment techniques, it is reasonable to combine the proficient and intermediate NAAL health literacy categories and compare this to the adequate category on the NVS, to compare the basic NAAL health literacy category with the possibility of limited literacy NVS category, and to compare the below basic NAAL health literacy category with the high likelihood of limited literacy NVS category[17, 21]. Although these crude comparisons must be interpreted somewhat cautiously including: adequate health literacy (65% NAAL vs. 47% Delta), possibility of limited literacy (22% NAAL vs. 28% Delta), and high likelihood of limited literacy (14% NAAL vs. 24% Delta); they suggest important differences in health literacy skills when our study in the rural Mississippi Delta is compared to national data. The NAAL study revealed that health literacy increases with each higher level of educational attainment and those living below the poverty level have lower average health literacy as compared to those above the poverty threshold. Our findings which identify both a significant relationship between educational achievement and nutrition literacy scores, and a significant relationship between income level and nutrition literacy score support the NAAL findings. Although our results did not identify race, age, or gender differences among nutrition literacy categories, the NAAL study indicated blacks have lower average health literacy
compared to whites, adults 65 years of age and older have lower average health literacy compared to younger age groups, and the average health literacy scores for men are lower than for women[21].

In our study, we assessed nutrition information seeking behaviors and defined seeking as an active and purposeful effort to obtain nutrition information. Our results suggest a clear association between nutrition seeking behaviors and nutrition literacy. The significant linear-by-linear association with nutrition literacy category and each media source we queried including television, newspaper/magazines, and Internet, indicates that nutrition information seeking increases as nutrition literacy skills increase. Other researchers have studied cancer-related information seeking behaviors, and distinguish seeking behaviors from scanning behaviors, where scanning is defined as passive or casual exposure to information [22, 23]. Findings point out scanning and seeking for cancer-related information are unmistakably separate behaviors and these behaviors have some clear associations with sociodemographic characteristics, lifestyle behaviors, cancer knowledge, and several health-relevant outcomes including fruit and vegetable intake[22, 23]. However, a limitation of our study is that we were unable to specifically distinguish between nutrition information scanning from seeking behaviors. The differences between nutrition information scanning and seeking behaviors and their relationships to nutrition literacy and dietary behaviors warrant further investigation.

The low use of Internet for general purposes and for seeking information related to nutrition, food or diet was a noteworthy finding of this study. The Internet was also the least trusted source of nutrition information. With launch of the www.MyPyramid.gov Website[3], the Internet
appears to be the major communication channel used to promote the *Dietary Guidelines* and *MyPyramid* key messages. Over the past decade the internet has undoubtedly caused a nationwide revolution in health information access, and in national surveys the Internet is consistently ranked among the most popular sources to obtain health information[11]. However, our findings suggest that Internet is not a frequently used or trusted source of nutrition information among adults in the Delta region. Not only is television viewing over four times higher than Internet usage, it is also a more trusted source of nutrition information. These findings suggest television is a more appropriate media channel for disseminating health and nutrition information and imply a need to increase the number of scientifically based messages related to diet recommendations during television programming. Although trust from non-print sources (including doctors or other health care providers, television, and family or friends) did not vary among literacy categories, individuals with lower literacy skills rated their trust in print sources (including magazines, newspaper and Internet) lower compared to those in higher nutrition literacy categories. Individuals in the lower nutrition literacy categories also had less confidence and rated barriers in seeking nutrition information higher. Collectively, these results identify important associations between seeking nutrition information and nutrition literacy. Although the NAAL study did not assess trust, barriers or confidence in seeking health information, the results indicate that when compared to adults with higher health literacy, those with lower health literacy receive less information about health from any written sources including the Internet[21].

This research conducted between November 2006 and April 2007, was approximately two years after release of the *Dietary Guidelines* in January of 2005 and the *MyPyramid* in April of 2005.
It was extremely important to discover only 12% of the Delta residents surveyed could correctly identify the MyPyramid graphic and the majority of respondents indicated they were not aware of the new Dietary Guidelines and rated their knowledge as poor. It is unclear if these findings are comparable to other populations since no other published research has examined the degree to which these new recommendations have infiltrated into other populations. Nevertheless, this finding illustrates poor dissemination of nutrition recommendations to this rural, health disparity region in the Delta.

The fact that 85% of participants in this study were classified as overweight or obese, as compared to a national average overweight and obesity prevalence in the United States of 66%, illustrates the critical nutrition- and obesity-related health disparities experienced by this Delta population [24]. Furthermore, considering that people tend to underreport weight, the documented rates of overweight and obesity based on self-reported measures in this study may be attenuated[25]. As this study suggests, focused attention to nutrition literacy may be one important priority area for reducing the burden of obesity and other nutrition-related chronic diseases in this region.

These findings have several practice and policy implications. First, if awareness of and access to trusted nutrition information is problematic, the likelihood of adopting healthy nutrition recommendations are greatly diminished. Relying on the Internet as a central mode of health communication may only be widening the health disparity gap among impoverished rural regions similar to the Delta. If health and nutrition professionals expect to compete with nutrition claims made through television and other types of advertising, they must understand and utilize
appropriate communication channels and overcome barriers to nutrition information usage.

Second, interpretations of our findings suggest it may be unrealistic to expect low nutrition literate individuals to seek information, regardless of the source, and educate themselves about nutrition-related decisions. The burden of low nutrition literacy is then partially shifted to nutrition educators to develop and deliver targeted nutrition outreach interventions which deemphasize the use of printed materials and remove the burden of individuals seeking nutrition information on their own. Correspondingly, it is important to realize the complexity of health literacy is not only affected by individual skills, but also by the organizations responsible for the delivery of health information and services. Finally, the potentially critical link between health literacy and disease prevention and health promotions has not been fully explored, as the majority of health literacy research has focused on the healthcare setting[26-34]. Since the implications for addressing health literacy in the context of primary prevention has enormous potential to impact public health, the need to understand limited health and nutrition literacy in non-primary care settings is exemplified in our study.

In summary, adults in the Delta are expected to comprehend and adopt complex nutrition recommendations, despite the lack of basic education and lack of nutrition and other health services. These results suggest the recent technology revolution and use of technology for health communication is problematic for impoverished rural areas, and especially ineffective for individuals with limited nutrition literacy skills. If we truly intend to reduce the burden of nutrition-related chronic diseases and communicate scientifically-based nutrition information to rural, disadvantaged communities in the Delta region, we must further strive to understand the causes and consequences of health and nutrition literacy.
Table 1: Relationship among Demographic Characteristics and Nutrition Literacy (n=177)

<table>
<thead>
<tr>
<th>Demographic Variables</th>
<th>No. (%)</th>
<th>Nutrition Literacy Score a Mean (SD)</th>
<th>P value b</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black or African American</td>
<td>144 (81)</td>
<td>3.12 (1.96)</td>
<td>0.21</td>
</tr>
<tr>
<td>White</td>
<td>33 (19)</td>
<td>3.61 (2.15)</td>
<td></td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>124 (70)</td>
<td>3.27 (2.00)</td>
<td>0.51</td>
</tr>
<tr>
<td>Male</td>
<td>53 (30)</td>
<td>3.06 (2.02)</td>
<td></td>
</tr>
<tr>
<td><strong>Age (years) c</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-30</td>
<td>31 (18)</td>
<td>3.16 (1.88)</td>
<td>0.16</td>
</tr>
<tr>
<td>31-40</td>
<td>29 (16)</td>
<td>3.62 (2.15)</td>
<td></td>
</tr>
<tr>
<td>41-50</td>
<td>42 (24)</td>
<td>3.21 (1.95)</td>
<td></td>
</tr>
<tr>
<td>51-60</td>
<td>39 (22)</td>
<td>3.46 (1.79)</td>
<td></td>
</tr>
<tr>
<td>61 and over</td>
<td>33 (19)</td>
<td>2.45 (2.22)</td>
<td></td>
</tr>
<tr>
<td><strong>Income Level (dollars)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;5,000</td>
<td>19 (11)</td>
<td>1.84 (2.04)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>5,000-14,999</td>
<td>52 (29)</td>
<td>2.63 (2.08)</td>
<td></td>
</tr>
<tr>
<td>15,000-24,999</td>
<td>29 (16)</td>
<td>2.93 (1.71)</td>
<td></td>
</tr>
<tr>
<td>25,000-34,999</td>
<td>24 (14)</td>
<td>3.50 (1.69)</td>
<td></td>
</tr>
<tr>
<td>35,000-44,999</td>
<td>20 (11)</td>
<td>3.70 (2.03)</td>
<td></td>
</tr>
<tr>
<td>&gt;45,000</td>
<td>16 (9)</td>
<td>5.31 (0.87)</td>
<td></td>
</tr>
<tr>
<td>Don’t know/Refused</td>
<td>17 (10)</td>
<td>4.00 (1.37)</td>
<td></td>
</tr>
<tr>
<td><strong>Highest Level of Education Completed</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 9th grade</td>
<td>28 (16)</td>
<td>2.43 (1.69)</td>
<td>0.008</td>
</tr>
<tr>
<td>9th -12th grade- some high school</td>
<td>41 (23)</td>
<td>2.88 (1.99)</td>
<td></td>
</tr>
<tr>
<td>High school diploma or GED</td>
<td>37 (21)</td>
<td>2.92 (2.18)</td>
<td></td>
</tr>
<tr>
<td>Some college or specialized training- no degree</td>
<td>36 (20)</td>
<td>3.81 (1.85)</td>
<td></td>
</tr>
<tr>
<td>Received Associate’s or Bachelor’s degree</td>
<td>22 (13)</td>
<td>3.59 (1.97)</td>
<td></td>
</tr>
<tr>
<td>Attended graduate school</td>
<td>13 (7)</td>
<td>4.46 (1.76)</td>
<td></td>
</tr>
<tr>
<td><strong>Body Mass Index (kg/m^2, calculated using self-reported height and weight) c</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underweight (&lt;18.5)</td>
<td>0 (0)</td>
<td>NA</td>
<td>0.85</td>
</tr>
<tr>
<td>Healthy weight (18.5-24.9)</td>
<td>31 (18)</td>
<td>3.16 (2.21)</td>
<td></td>
</tr>
<tr>
<td>Overweight (25.0-29.9)</td>
<td>55 (31)</td>
<td>3.11 (1.97)</td>
<td></td>
</tr>
<tr>
<td>Obese (≥30)</td>
<td>90 (51)</td>
<td>3.30 (1.97)</td>
<td></td>
</tr>
</tbody>
</table>

a Assessed using the Newest Vital Sign with scores ranging 0-6
b One-way ANOVA for difference in nutrition literacy score among demographic variables
c The sample size does not equal 177 due to a few missing responses
Table 2: Participants’ use of Media Channels for General Purposes and for Seeking Information about Nutrition (n=177)

<table>
<thead>
<tr>
<th>Nutrition Literacy Category</th>
<th>Overall (n=177)</th>
<th>Category 1: High Likelihood of Limited Literacy Skills (n=42)</th>
<th>Category 2: Possibility of Limited Literacy Skills (n=50)</th>
<th>Category 3: Adequate Literacy Skills (n=85)</th>
<th>Pairwise Comparison of Nutrition Literacy Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Media use for general purposes, Mean (SD)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Television (hours per week)</td>
<td>27.8 (16.5)</td>
<td>35.9 (15.9)</td>
<td>25.7 (13.0)</td>
<td>25.1 (17.5)</td>
<td>0.001&lt;sup&gt;a&lt;/sup&gt; 1 &gt; 2,3</td>
</tr>
<tr>
<td>Radio (hours per week)</td>
<td>15.6 (15.2)</td>
<td>17.4 (14.5)</td>
<td>15.1 (14.5)</td>
<td>15.6 (15.9)</td>
<td>0.59&lt;sup&gt;a&lt;/sup&gt; NS&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Internet (hours per week)</td>
<td>6.5 (9.9)</td>
<td>5.4 (11.0)</td>
<td>5.5 (9.7)</td>
<td>7.7 (9.4)</td>
<td>0.32&lt;sup&gt;a&lt;/sup&gt; NS&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Newspaper (days per week)</td>
<td>2.9 (2.5)</td>
<td>2.6 (2.5)</td>
<td>2.3 (2.2)</td>
<td>3.4 (2.6)</td>
<td>0.03&lt;sup&gt;a&lt;/sup&gt; 2 &lt; 3</td>
</tr>
<tr>
<td><strong>Confirmed using television for nutrition information</strong></td>
<td>101 (57)</td>
<td>17 (10)</td>
<td>20 (11)</td>
<td>64 (36)</td>
<td>0.001&lt;sup&gt;c&lt;/sup&gt; NA&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td>Confirmed using newspaper or magazine for nutrition information</td>
<td>88 (50)</td>
<td>15 (8)</td>
<td>18 (10)</td>
<td>55 (31)</td>
<td>&lt;0.001&lt;sup&gt;c&lt;/sup&gt; NA&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td>Confirmed using Internet for nutrition information</td>
<td>36 (20)</td>
<td>4 (2)</td>
<td>7 (4)</td>
<td>25 (14)</td>
<td>0.008&lt;sup&gt;c&lt;/sup&gt; NA&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Frequency of media use for information about nutrition, food or diet, Mean (SD)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Television for nutrition information (number of times per month)</td>
<td>1.9 (2.4)</td>
<td>1.5 (2.5)</td>
<td>1.2 (2.0)</td>
<td>2.6 (2.5)</td>
<td>.002&lt;sup&gt;a&lt;/sup&gt; 1 &lt; 3</td>
</tr>
<tr>
<td>Newspaper or magazine for nutrition information (number of times per month)</td>
<td>1.4 (2.1)</td>
<td>0.6 (0.9)</td>
<td>1.3 (2.1)</td>
<td>1.9 (2.3)</td>
<td>.003&lt;sup&gt;a&lt;/sup&gt; 1 &lt; 3</td>
</tr>
<tr>
<td>Internet for nutrition information (number of times per month)</td>
<td>0.5 (1.5)</td>
<td>0.5 (1.8)</td>
<td>0.2 (0.3)</td>
<td>0.7 (1.8)</td>
<td>.17&lt;sup&gt;a&lt;/sup&gt; NS&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup>One-way ANOVA  
<sup>b</sup>Not significant  
<sup>c</sup>Mantel-Haenszel chi-square (linear-by-linear association)  
<sup>d</sup>Pairwise comparison does not apply
Table 3: Trust, Confidence, and Barriers to Seeking Nutrition Information

<table>
<thead>
<tr>
<th>Level of trust of nutrition, food or diet information sources&lt;sup&gt;a,b&lt;/sup&gt;</th>
<th>Overall</th>
<th>Nutrition Literacy Category</th>
<th>Pairwise Comparison of Nutrition Literacy Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean(SD)</td>
<td>Category 1: High Likelihood of Limited Literacy Skills Mean(SD)</td>
<td>Category 2: Possibility of Limited Literacy Skills Mean(SD)</td>
</tr>
<tr>
<td>Doctor or other health care provider</td>
<td>3.6 (0.7)</td>
<td>3.5 (0.6)</td>
<td>3.5 (0.8)</td>
</tr>
<tr>
<td>Television</td>
<td>3.0 (0.7)</td>
<td>2.9 (0.9)</td>
<td>3.0 (0.7)</td>
</tr>
<tr>
<td>Family or friend</td>
<td>2.8 (0.7)</td>
<td>2.7 (0.8)</td>
<td>2.8 (0.7)</td>
</tr>
<tr>
<td>Magazine</td>
<td>2.7 (0.8)</td>
<td>2.5 (0.8)</td>
<td>2.4 (0.9)</td>
</tr>
<tr>
<td>Newspaper</td>
<td>2.6 (0.9)</td>
<td>2.2 (0.8)</td>
<td>2.5 (1.0)</td>
</tr>
<tr>
<td>Radio</td>
<td>2.5 (0.8)</td>
<td>2.8 (0.9)</td>
<td>2.4 (0.8)</td>
</tr>
<tr>
<td>Internet</td>
<td>2.3 (1.0)</td>
<td>1.9 (1.0)</td>
<td>2.2 (1.0)</td>
</tr>
</tbody>
</table>

Confidence in getting information about nutrition, food or diet<sup>c,d</sup>

<table>
<thead>
<tr>
<th></th>
<th>Overall</th>
<th>Mean(SD)</th>
<th>Category 1</th>
<th>Category 2</th>
<th>Category 3</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confidence</td>
<td>3.6 (0.9)</td>
<td>3.3 (1.2)</td>
<td>3.6 (0.9)</td>
<td>3.8 (0.8)</td>
<td>0.007</td>
<td>1&lt;3</td>
</tr>
</tbody>
</table>

Barriers to seeking information about nutrition, food or diet<sup>e,f</sup>

<table>
<thead>
<tr>
<th></th>
<th>Overall</th>
<th>Mean(SD)</th>
<th>Category 1</th>
<th>Category 2</th>
<th>Category 3</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>It took a lot of effort to get the information you needed</td>
<td>3.1 (1.4)</td>
<td>3.6 (1.4)</td>
<td>3.5 (1.4)</td>
<td>2.7 (1.3)</td>
<td>0.04</td>
<td>1, 2&gt;3</td>
</tr>
<tr>
<td>You felt frustrated during your search</td>
<td>2.7 (1.4)</td>
<td>3.1 (1.7)</td>
<td>3.1 (1.5)</td>
<td>2.3 (1.1)</td>
<td>0.01</td>
<td>1, 2&gt;3</td>
</tr>
<tr>
<td>You were concerned about the quality</td>
<td>3.5 (1.5)</td>
<td>3.5 (1.4)</td>
<td>3.0 (1.5)</td>
<td>3.5 (1.5)</td>
<td>0.75</td>
<td>NS&lt;sup&gt;g&lt;/sup&gt;</td>
</tr>
<tr>
<td>The information you found was too hard to understand</td>
<td>2.6 (1.3)</td>
<td>3.0 (1.6)</td>
<td>2.7 (1.4)</td>
<td>2.4 (1.2)</td>
<td>0.22</td>
<td>NS&lt;sup&gt;g&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup>Overall (n=176), Category 1 (n=41), Category 2 (n=50), Category 3 (n=85)
<sup>c</sup>Overall (n=174), Category 1 (n=40), Category 2 (n=50), Category 3 (n=84)
<sup>e</sup>Overall (n=103), Category 1 (n=19), Category 2 (n=27), Category 3 (n=57) (reduced numbers due to skip pattern in questionnaire)
<sup>g</sup>Not significant
References


Acknowledgements

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Abstract: Objective: To explore cultural perceptions of the MyPyramid key messages and identify factors that may impact adoption of these recommendations.

Design: In-depth structured-interviews.

Participants: Twenty-three adults, primarily African American females, residing in the Lower Mississippi Delta.

Analysis: Systematic content analysis of transcripts.

Results: When asked to identify good reasons to follow the MyPyramid key messages, non-specific references to improved health were most prevalent (n=130); however, participants also acknowledged the importance of getting vitamins and nutrients (n=81), and the impact food choices have on health conditions (n=77) and organ systems (n=65). Individual level factors (n=211), such as dislike for foods and tradition or customs, far outnumbered environmental level factors (n=48), such as cost and availability as perceived
reasons preventing community members from adhering to the key messages. The most frequently mentioned suggestion for helping community members eat according to the MyPyramid were to raise awareness (n=93), provide information (n=65), and improve the taste of or provide opportunity to taste (n=49).

Conclusions and Implications: This study captured participants' cultural perspectives of the MyPyramid key messages. Results indicate that both social marketing campaigns and intervention efforts focused on individual level factors are needed to promote the MyPyramid in this disadvantaged Delta region.
Meaningful messages: Adults in the Lower Mississippi Delta provide cultural insight into strategies for promoting the MyPyramid

Journal Section: Research Brief

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Meaningful messages: Adults in the Lower Mississippi Delta provide cultural insight into strategies for promoting the MyPyramid

INTRODUCTION

With the recent release of the 2005 Dietary Guidelines for Americans(1) and MyPyramid Food Guidance System (MyPyramid)(2), little is understood about the public’s perception of these new recommendations. Development of the education messages for the MyPyramid involved two phases of consumer research using 26 focus groups; however focus group participants were limited to three US cities including Baltimore, Chicago, and Houston(3). Therefore, it is important to assess how other populations perceive the MyPyramid, especially vulnerable populations where nutritional disparities are prevalent and accessibility to health services and health information are limited.

The Lower Mississippi Delta (Delta) region is predominantly rural with a high concentration of African Americans, high rates of poverty, and low educational achievement(4). Overall health and nutritional disparities are well documented in the Delta region(5-8). When compared to the United States population, Delta adults have poorer adherence to recommendations of the Food Guide Pyramid, including lower intakes of fruits and vegetables, higher dietary fat, lower dietary fiber, lower calcium, and overall lower Healthy Eating Index Scores (7, 8).

When developing communication and media approaches, including those used to promote the MyPyramid, the messages and communication channels must be viewed as personally and culturally relevant, taking into account cultural perspectives, values, and beliefs. Culture gives
meaning to health communication; therefore messages must be developed and delivered within the context of culture and language(9). The long-term goal of this research is to develop and disseminate culturally appropriate nutrition messages pertaining to the 2005 Dietary Guidelines and MyPyramid in the rural Delta region. The primary objective of this qualitative study was to explore perceptions of the MyPyramid and identify factors that may promote or inhibit adoption of these new guidelines by this population.

**EVALUATION PROCESS**

This project was approved by “blinded for reviewers” Institutional Review Board. In-depth structured-interviews were conducted using a semi-structured interview guide. An expert panel consisting of three doctoral-level Registered Dietitians and one health communication expert developed and established content validity of the interview guide. Based on previous consumer research, it was anticipated that participants would have limited understanding of some MyPyramid terminology and concepts, such as whole grains, vegetable sub-groups, types of fat, and others (3). Therefore, consumer information posted on the MyPyramid.gov website was utilized to develop a brief explanation of each key message for the interview guide. Visual aid handcards were also developed to illustrate key message concepts. Prior to use in this study, the interview guide and handcards underwent cognitive testing with four individuals and appropriate changes were made. This report details participants’ responses to three questions asked for 10 key messages of the MyPyramid as illustrated in Tables 1-3 including 1) What are some good reasons for people in your community to eat ____?, 2) What keeps people
in your community from eating ____?, and 3) What would make or help people in your community want to eat ____?

The target population for this research included adults residing in the rural Lower Mississippi Delta. A purposeful, proportional quota sampling plan based on educational achievement was developed with the goal to interview approximately three respondents from seven different educational strata as defined by the Census Bureau (4). A purposeful sampling can be justified in this research because the investigators were interested in achieving an in-depth understanding of culturally appropriate nutrition messages from selected “information rich” respondents. A proportional quota sampling plan was developed to ensure reasonable representation of viewpoints from the target population. Community Health Advisors as Research Partners (CHARP) helped identify, recruit and schedule participants to meet the sampling plan. The CHARPs are volunteer community members who serve as a vital link between their communities and the health care system and have successfully helped recruit subjects for several research projects (10). Two African American graduate research assistants with a Bachelors of Science degree in dietetics were trained to conduct the interviews. The graduate research assistants also tape recorded the interviews and took field notes. Each interview lasted approximately one hour. The CHARPs received $10 for each participant they recruited and the participants received a $25 gift card for their time.

All of the audiotapes were transcribed verbatim. Systematic content analysis was used to evaluate the transcripts(11). Two researchers independently reviewed the transcripts and met to identify major themes and develop a distinct coding system. Three researchers then independently coded the transcripts and subsequently met to review assigned codes and reconcile disagreements. Finally, frequencies of distinct codes were determined and conclusions were drawn. The qualitative report was verified by the two interviewers involved in collecting the qualitative data.
SAMPLE POPULATION AND LESSONS LEARNED

The sample included 23 adults, 19 females and 4 males, residing in the Mississippi Delta. The majority of participants were African American (n=22) and one was white. Six participants were 19-40 years of age, eight participants were 41-60 years of age, and nine participants were >60 years of age. These age categories are respectively referred to as young, middle-aged, and older in the qualitative quotes below. In agreement with the proportional quota sampling plan, a representative distribution of education levels were sampled including three with less than a 9th grade education, three with a 9th-12th grade education, three with a high school diploma or equivalent, three with some college – no degree, two with an associate’s degree, five with a bachelor’s degree, and four with some graduate school. These 23 participants contributed a sufficient amount of in-depth data to establish major themes within each question (12).

Reasons to Adhere to MyPyramid Key Messages

Table 1 illustrates the emerging themes and frequencies of participants’ response to good reasons for community members to eat according to principles promoted in the MyPyramid. Across all key messages, non-specific, generic references to improved health such as the examples included were most common (n=130):

Q: What are some good reasons for people in your community to eat a variety of vegetables?
A: *I think to eat a variety of vegetables that would be helping you with all of your anatomies of your body. Helping you think right and helping your body be physically fit in order to remain healthy.* (young female)
Q: What are some good reasons for people in your community to eat a variety of fruits?

A: *Because they're a part of your daily requirement too. I think you need to eat two fruit [sic] a day. Help improve and maintain good health. (older female)*

Overall, numerous participants also acknowledged the importance of getting vitamins and nutrients (n=81), and the impact food choices have on health conditions (n=77) and organ systems (n=65). However, the frequencies within responses to each question were relatively low. For example, when asked good reasons to eat whole grains, of the 23 participants, only three participants stated fiber and five referred to the digestive system or bowels. Similarly, when asked good reasons to eat fewer added sugars, only three participants each mentioned weight loss and diabetes.

Fat and cholesterol (n=29) and general references to vitamins and minerals (n=15) were commonly mentioned. Taken as a whole, weight loss or overweight (n=27), high blood pressure (n=16), diabetes (n=12), and the body’s cholesterol (n=11) were the most frequently acknowledged health conditions being impacted by food choice. However, again, it is especially important to note the low frequencies within each question; for example very few respondents identified a health condition (including blood pressure, diabetes or cholesterol) as a good reason to eat a variety of fruits and vegetables.

Participants seldom used the word obesity. They were more likely to talk about weight loss (n=27) and less likely to mention calories (n=5). Participants did not state the term heart disease and rarely mentioned the term circulatory system; rather they consistently used the term “clog your arteries”:

Q: What are some good reasons for people in your community to eat more vegetable oils and less solid fats?
A: *The vegetable oils probably won't clog the arteries like the less [sic] solid fats which are the fat back, butter, stick margarine, and shortening, and lard oils.* (young female)

In reference to the skeletal system, participants did not mention osteoporosis; rather they made reference to the bones and teeth. The nervous system was not specifically named; rather participants associated eating fish with being good for the brain:

Q: What are some good reasons for people in your community to eat more fish, beans, and nuts?

A: *A lot of people in my area eat a lot of catfish. Mostly we gonna [sic] eat it fried. Fish is good for your brain.* (older female)

**Factors that Prevent Compliance to MyPyramid Key Messages**

As described in Table 2, individual level factors (n=211) far outnumbered environmental level factors (n=48) as perceived reasons preventing community members from adhering to the MyPyramid key messages. The most common perceived individual level factors were dislike for foods (n=69) and preference for competing foods (n=37):

Q: What keeps people in your community from eating whole grains?

A: *That's a good question. Probably because they really don't like the wheat part. They like the starchy grains more than the healthy grains, and maybe because of the taste.* (young female)

Q: What keeps people in your community from eating a variety of vegetables?

A: *Because they [sic] stuck on greens and they don't like the taste of broccoli and other stuff.* (young male)

Q: What keeps people in your community from baking, broiling, or grilling their meats?

A: *They don't bake or broil. They just love fried.* (older male)
Tradition or customs (n=42) was also a frequently mentioned deterrent for adhering to the key messages, especially when asked about low-fat or lean meats and poultry (n=8) and vegetable oils (n=7):

Q: What keeps people in your community from eating low-fat or lean meats and poultry?
A: *Because we didn’t grow up eating this type of food and it's a little hard for us to change what we've been accustomed to.* (older female)

Q: What keeps people in your community from eating more vegetable oils and less solid fats?
A: *That's just the way some of us were brought up eating a lot of grease, fat, and stuff.* (middle-aged female)

Although laziness was mostly related to exercise (n=12), there was also a common viewpoint that individuals were too lazy (n=4) or lack the time (n=2) to prepare vegetables.

Q: What keeps people in your community from getting more exercise?
A: *They don't want to get up out of bed, get off the porch, get out the yard. Lazy.* (older female)

Q: What keeps people in your community from eating a variety of vegetables?
A: *Some people are very lazy- They don't like to clean and process especially turnip and collard greens.* (older female)

Lack of knowledge (n=17), lack of exposure (n=16), and lack of time (n=11) were also commonly cited individual level factors that prevented community members from adhering to the key messages.

Q: What keeps people in your community from eating more vegetable oils and less solid fats?
A: *I would guess they've never taught about it. Maybe some people don't even know it's better for them.* (older female)

Q: What keeps people in your community from eating a variety of fruits?
A: The only thing I can think of is about getting the variety of fruits. I don't know, I really don't know why they don't get the variety. I just didn’t know that much and haven't been exposed to them. A lot of them look at the kiwi and they don't like the look of kiwi. (older male)

Q: What keeps people in your community from eating whole grains?

A: To tell the truth really sometimes some of them hadn't even tried it and they really don't know how it tastes. (older female)

Q: What keeps people in your community from eating more fish, beans, and nuts?

A: ...and the beans they just, some people just don't eat them probably because it takes too long to cook them. (middle-aged female)

Q: What keeps people in your community from eating more fish, beans, and nuts?

A: Right now fish has become too expensive. Even though some get food stamps it's still too expensive. But on the other hand they prefer pork instead of fish- what they came up on. (older female)

Q: What keeps people in your community from eating more vegetable oils and less solid fats?

A: The price. The peanut oil and olive oil is really expensive in this area and the solid fats are much cheaper. (middle-aged female)

Q: What keeps people in your community from eating a variety of fruits?

A: A lot of fruits in my community are not grown there- like berries, apples, apricots. So a lot of time they don't have the money to buy them. (older female)
Strategies to Promote Compliance to MyPyramid Key Messages

As shown in Table 3, general suggestions of encouragement or awareness (n=60) were the most frequently mentioned suggestions for helping community members eat according to the MyPyramid. Recommendation from a doctor (n=17) was suggested more frequently than promotion through the media or TV (n=10) or church (n=6).

Q: What would make or help people in your community want to eat whole grains more often?
A: I believe if they were told about it more often. I think they should be continuously told about it. (older female)

Q: What would make or help people in your community want to eat low-fat or lean meats and poultry more often?
A: The only thing gonna [sic] help us is if the doctor says we have to. (middle-aged female)

Increase knowledge or provide education sessions (n=65) and improve the taste or provide opportunity to taste (n=49) were repeatedly cited as well.

Q: What would make or help people in your community want to eat a variety of vegetables more often?
A: If the community would set up a day for a vegetable dinner and invite people over for dinner, then people would get used to eating vegetables. Because I would. (older female)

Q: What would make or help people in your community want to eat/drink low-fat or fat free milk and milk products more often?
A: By trying different things. They can see that fat-free foods are not so bad. (young male)
Similar to the above findings, environmental changes (n=29) were perceived to be a less significant factor for helping community members eat according to the MyPyramid, however decreasing food costs (n=18) and increasing availability (n=7) were mentioned fairly frequently:

Q: What would make or help people in your community want to eat a variety of fruits?

A: If they were made available to them at a lower cost. Like one lady in the community has planted a fruit orchard - she just give them fruit at no cost. So that might encourage them to eat them because they don’t have to come out of pocket. (middle-aged female)

DISCUSSION

Any efforts aimed at promoting the MyPyramid in targeted disadvantaged populations should be preceded by identifying factors that influence adoption of the recommendations. This is especially important in regions, such as the Lower Mississippi Delta, where cultural dynamics have an immense influence on food choices and health practices. Although consumer research was used to develop the MyPyramid, no known published research has examined the perception and application of the MyPyramid key messages among targeted disadvantaged populations(3). The qualitative nature of this study helped capture the cultural and social application of the MyPyramid among the Delta population and provided valuable information on factors promoting and inhibiting adoption of the key messages.

The preponderance of responses for good reasons to comply with the MyPyramid key messages (Table 1) suggest that health messages, rather than nutrition messages, would be most effective for communicating MyPyramid recommendations to this population. Of all responses, 77% reflected health and physical function themes and 23% reflected nutrient themes. Of
responses categorized under health themes, 48% of those reflected general, non-specific health
themes, whereas 52% were related to specific health conditions or organs/systems. Considering
each MyPyramid key message individually, frequencies were much greater for general, non-
specific health messages than for messages related to any particular health condition or organ
system. These findings could suggest that Delta adults would most easily respond to broad health
messages aimed at promoting adherence to the MyPyramid. Conversely, the relatively low
frequencies within each key message for specific health conditions and organ systems could
indicate a lack of awareness and knowledge that adoption of the key messages could lead to
overall improvement of health and prevent or ameliorate specific health conditions that plague this
population, including high blood pressure, heart disease, and diabetes (5). With a heavy focus on
nutrient density in the 2005 Dietary Guidelines and the historical trend for the consumer guidance
system to increase in complexity; these findings are important (13, 14).

Interpreted collectively, the overall thematic responses regarding issues preventing compliance
with the MyPyramid (Table 2) and factors for helping community members eat according to the
MyPyramid (Table 3) indicate that both social marketing campaigns and intervention efforts
focused on individual level factors are needed. Prioritizing endeavors to improve the nutritional
status of this population are difficult since a variety of individual, community and environmental
factors affect the health and dietary patterns of Delta residents (15). Therefore it was important to
discover that individual level factors were perceived to have a greater impact on adopting
MyPyramid key messages than environmental factors. This finding supports a previous study
whereby 490 key informants from the Delta region rated individual factors including food choice,
education, willingness to change, and health behaviors more important than community level
factors with regard to nutrition and health problems (16).
Suggestions of encouragement, awareness, and increased knowledge were cited most frequently as factors that would help people in the community follow the MyPyramid recommendations. This implies that the MyPyramid messages have not infiltrated this region. With launch of the MyPyramid.gov, the internet has been a primary method for promoting the MyPyramid; however these Delta participants do not mention the use of computers as a way to promote the recommendations (2). Social marketing campaigns in these communities may be a good starting point to promote the MyPyramid key messages. These social marketing campaigns must address the individual and cultural barriers identified in this research, such as dislike for foods, tradition or customs, and lack of knowledge, exposure and time. In light of these barriers, these results also indicate that social marketing alone is not sufficient, and that educational opportunities to promote knowledge of the MyPyramid and increase the exposure to new types of foods and preparation techniques are needed.

The number of participants and population targeted in this research clearly limits generalization of these findings to the general public. However, because the sampling methodology attained a sufficient range of education levels and ages, these findings could be generalized to other populations in the southern Black Belt Region. This region refers to 623 counties located across parts of 11 southern states (17). Similar to the Delta region, these contiguous counties contain a high percent of African Americans, and are characterized by numerous inequalities including rural decline, poor health, and inadequate education.

Another arguable limitation of this research is the somewhat subjective nature of qualitative data analysis. However, the use of three independent researchers to code the transcripts helped establish frequency consensus on final thematic counts of the transcripts. Furthermore, the qualitative nature of this research may have actually minimized data analyses bias because
participants were not forced or limited to responses that the researchers pre-defined, rather participants provided detailed reactions to the MyPyramid in their own words.

IMPLICATIONS FOR RESEARCH AND PRACTICE

This research will serve as the foundation for developing culturally meaningful messages and communication strategies to promote the MyPyramid key messages in the Lower Mississippi Delta, and may help inform other nutrition educators working with disadvantaged, rural African American populations. This research also exemplifies the importance of formative research and the need for nutrition educators to consider cultural context prior to developing and implementing nutrition interventions to promote the MyPyramid. Finally, this research lays the conceptual foundation for replication by other nutrition researchers interested in exploring the cultural application of the MyPyramid in the communities where they practice.
References


Meaningful messages: Adults in the Lower Mississippi Delta provide cultural insight into strategies for promoting the MyPyramid

Abstract:

**Objective:** To explore cultural perceptions of the MyPyramid key messages and identify factors that may impact adoption of these recommendations.

**Design:** In-depth structured-interviews.

**Participants:** Twenty-three adults, primarily African American females, residing in the Lower Mississippi Delta.

**Analysis:** Systematic content analysis of transcripts.

**Results:** When asked to identify good reasons to follow the MyPyramid key messages, non-specific references to improved health were most prevalent (n=130); however, participants also acknowledged the importance of getting vitamins and nutrients (n=81), and the impact food choices have on health conditions (n=77) and organ systems (n=65). Individual level factors (n=211), such as dislike for foods and tradition or customs, far outnumbered environmental level factors (n=48), such as cost and availability as perceived reasons preventing community members from adhering to the key messages. The most frequently mentioned suggestion for helping community members eat according to the MyPyramid were to raise awareness (n=93), provide information (n=65), and improve the taste of or provide opportunity to taste (n=49).

**Conclusions and Implications:** This study captured participants' cultural perspectives of the MyPyramid key messages. Results indicate that both social marketing campaigns and intervention efforts focused on individual level factors are needed to promote the MyPyramid in this disadvantaged Delta region.
Table 1: Emerging themes and response frequencies to the question “What are some good reasons for people in your community to eat_________?” (n=23)

<table>
<thead>
<tr>
<th>General suggestion of improved health</th>
<th>Whole grains</th>
<th>A variety of vegetables</th>
<th>A variety of fruits</th>
<th>Low-fat or fat free milk and milk products</th>
<th>Low-fat or lean meats and poultry</th>
<th>Bake, broil, or grill their meats</th>
<th>More fish, beans, and nuts</th>
<th>More vegetable oils and less solid fats</th>
<th>Fewer added sugars</th>
<th>Get more exercise</th>
<th>TOTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nutrients or calories</td>
<td>14</td>
<td>18</td>
<td>13</td>
<td>8</td>
<td>9</td>
<td>14</td>
<td>15</td>
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<td>130</td>
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<td>Fat or cholesterol</td>
<td>9</td>
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<td>11</td>
<td>9</td>
<td>8</td>
<td>2</td>
<td>0</td>
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<td>7</td>
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<td>1</td>
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<td>0</td>
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<td>0</td>
<td>1</td>
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<td>“Other” specific nutrients</td>
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</table>
Table 2: Emerging themes and response frequencies to the question “What keeps people in your community from eating ______?” (n=23)

<table>
<thead>
<tr>
<th>Individual level factors</th>
<th>Whole grains</th>
<th>A variety of vegetables</th>
<th>A variety of fruits</th>
<th>Low-fat or fat free milk and milk products</th>
<th>Low-fat or lean meats and poultry</th>
<th>Bake, broil, or grill their meats</th>
<th>More fish, beans, and nuts</th>
<th>More vegetable oils and less solid fats</th>
<th>Fewer added sugars</th>
<th>Get more exercise</th>
<th>TOTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dislike these foods</td>
<td>11</td>
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<td>16</td>
<td>18</td>
<td>8</td>
<td>5</td>
<td>2</td>
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<td>2</td>
<td>0</td>
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<td>Preference for competing food</td>
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<td>5</td>
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<td>1</td>
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<td>37</td>
</tr>
<tr>
<td>Tradition or customs</td>
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<td>4</td>
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<td>0</td>
<td>12</td>
<td>19</td>
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<tr>
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<td>4</td>
<td>0</td>
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<td>3</td>
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<td>17</td>
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<tr>
<td>Lack of exposure</td>
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<td>1</td>
<td>4</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>16</td>
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</tr>
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<td>Lack of time</td>
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<td>0</td>
<td>0</td>
<td>2</td>
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<td>0</td>
<td>0</td>
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<td>0</td>
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<td>Environmental level factors</td>
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<td></td>
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<td></td>
<td></td>
</tr>
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<td>Expense/cost</td>
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<td>0</td>
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<td>3</td>
<td>0</td>
<td>6</td>
<td>8</td>
<td>3</td>
<td>0</td>
<td>29</td>
</tr>
<tr>
<td>Lack of availability</td>
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<td>2</td>
<td>6</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>Other</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>4</td>
<td>7</td>
</tr>
</tbody>
</table>
Table 3: Emerging themes and response frequencies to the question “What would make or help people in your community want to eat________?” (n=23)

<table>
<thead>
<tr>
<th>Theme</th>
<th>Whole grains</th>
<th>A variety of vegetables</th>
<th>A variety of fruits</th>
<th>Low-fat or fat free milk and milk products</th>
<th>Low-fat or lean meats and poultry</th>
<th>Bake, broil, or grill their meats</th>
<th>More fish, beans, and nuts</th>
<th>More vegetable oils and less solid fats</th>
<th>Fewer added sugars</th>
<th>Get more exercise</th>
<th>TOTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Encouragement, awareness, recommendation or promotion</td>
<td>11</td>
<td>9</td>
<td>10</td>
<td>5</td>
<td>11</td>
<td>8</td>
<td>6</td>
<td>15</td>
<td>7</td>
<td>11</td>
<td>93</td>
</tr>
<tr>
<td>Encouragement or awareness</td>
<td>7</td>
<td>6</td>
<td>6</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>12</td>
<td>4</td>
<td>8</td>
<td>60</td>
</tr>
<tr>
<td>Recommendation from a doctor</td>
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<td>1</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>17</td>
</tr>
<tr>
<td>Promotion through the media or TV</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Promotion through church</td>
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<td>1</td>
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<td>0</td>
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<td>0</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Increase knowledge or provide education sessions</td>
<td>7</td>
<td>4</td>
<td>6</td>
<td>5</td>
<td>6</td>
<td>5</td>
<td>8</td>
<td>5</td>
<td>10</td>
<td>9</td>
<td>65</td>
</tr>
<tr>
<td>Increase knowledge or provide information</td>
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<td>2</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>8</td>
<td>3</td>
<td>8</td>
<td>1</td>
<td>46</td>
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<tr>
<td>Health fairs or classes</td>
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<td>2</td>
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<td>1</td>
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<td>0</td>
<td>2</td>
<td>2</td>
<td>8</td>
<td>19</td>
</tr>
<tr>
<td>Improve the taste or provide opportunity to taste</td>
<td>5</td>
<td>9</td>
<td>4</td>
<td>12</td>
<td>6</td>
<td>6</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
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<td>Improve the taste of the food or make more appealing</td>
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<td>1</td>
<td>8</td>
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<td>4</td>
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<td>3</td>
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<td>5</td>
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<td>Decrease food costs</td>
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Acknowledgements

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