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The “Art of Living Smart” Summer Camp Survey Results in Mississippi Delta Students Ages 6-13

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Abstract

Overweight in children is associated with lower academic achievement, depression, chronic diseases, and increases the risk of being overweight as an adult. Participation in physical activity and consumption of fruits and vegetables help prevent overweight in children. Mississippi has the second lowest rate of fruit and vegetable consumption in the nation. Being lower income and non-Hispanic black is associated with lower consumption of all recommended food groups, especially fruits and vegetables. In addition, rates of physical activity decline as children age. It is critical for children to develop healthy habits that carry into adulthood. Health and nutrition education are a means of helping children understand the importance of physical activity and eating a balanced diet that includes fruits and vegetables. The Art of Living Smart summer camp (AOLS) provides health and nutrition education through cultural arts to Mississippi delta children between six and thirteen years of age. The goal of the camp is to increase fruit and vegetable intake and physical activity. Three survey instruments were utilized to collect data before and after the camp, which included: Fruit, Fruit Juice, and Vegetable Preferences (FJV-P) (Jaramillo et al., 2006); Knowledge of Fruits and Vegetables (FJV-K) (Baranowski et al., 2000); and Physical Activity and Me (PA) (Sherwood et al., 2004). Overall the camp had the most positive impact on the six to eight year old participants in all three areas, including the likability...
of fruits and vegetable, knowledge of fruits and vegetables, and perceived difficulty of tasks associated with physical activity.

**Keywords:** child nutrition; nutrition education; childhood obesity; FJV-K; FJV-P; Physical Activity and Me; AOLS camp; Mississippi Delta

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According to the National Health and Nutrition Examination Survey (NHANES), obesity rates have increased among children aged 6 to 11 years, from 6.5% in 1980 to 19.6% in 2008. The obesity rates for Mississippi’s children are even greater. The Child and Youth Prevalence of Overweight Survey of Mississippi Children, conducted in 2003 through the Mississippi Department of Health, obtained actual measurements of heights and weights, rather than using self-reported data. This survey found that 24% of Mississippi children in grades one through eight were overweight. They further found that the rate of overweight increased with grade level (Mississippi State Department of Health, 2007). A report from The Mississippi Department of Education’s Office of Healthy Schools (n.d.) found that 40% of children in Mississippi are overweight or obese, which is a significant concern since overweight children tend to have lower academic achievement, have an 80 percent chance of becoming overweight or obese as adults, and are at increased risk of depression and chronic disease (Judge & Jahns, 2007). Helping children establish a healthy weight decreases the chances of them becoming obese as adults (Guo, Chunlea, & Roche, 2002).

As a result, school-aged children are encouraged to participate in physical activity for one hour each day, as this practice is considered part of a healthy school environment and is also a strategy in the treatment of obesity. The Center for Disease Control (CDC) and Prevention in conjunction with the U.S. Department of Health and Human Services (DHHS) recently reported that physical activity influences cognitive skills, attitudes, academic behaviors, performance, and achievement (CDC, DHHS, 2010). Even more recently, the CDC (2012) found that only 77% of children ages nine through thirteen reported participating in any amount of free-time physical activity during the seven days preceding the survey and those rates of physical activity decline as children age. While the need for physical activity is present, the knowledge and skills needed to implement it effectively are often absent in rural and/or high poverty areas like much of Mississippi.

Fruits and vegetables are also an important part of a healthy diet and help in the prevention of overweight and obesity. Nationally, only one in five people consume the servings of fruits and vegetables as recommended by the Dietary Guidelines for Americans. Mississippi has the second lowest rate of fruit and vegetable consumption in the nation (Mississippi Department of Education’s Office of Healthy Schools (n.d.), with a strong association between income and race/ethnicity and the consumption of healthy foods. Most notably, being lower income and non-Hispanic black is associated with lower consumption of all recommended food groups, especially fruits and vegetables. Therefore, the need for strategies to improve
consumption of fruits and vegetables is especially important for these groups (Kirkpatrick, Dodd, Reedy, and Krebs-Smith, 2012).

While the obesity epidemic and lack of adequate physical activity in Mississippi are prevalent threats to a healthy and productive population, the larger associations that bolster these are not always as clear. A growing body of research garners substantial support for the inevitable connections among one’s environment, nutritional intake, and academic performance (Taras, 2005). More specifically, areas identified as food deserts (geographical locations with low-income and low-access to supermarkets with fresh produce (USDA 2013)), directly influences local inhabitants’ intake of nutritionally sound foods like fruits and vegetables (Rose-Jacobs et al., 2008). This in turn affects individuals’ cognitive abilities and processes required for academic achievement (Cook & Frank, 2008; Gale, 2010; Northstone, Joinson, Emmett, Ness, & Paus, 2011). Thus, Mississippi’s obesity epidemic is a testament to its status as a food desert and translates, through a simple chain of events, into lowered academic performance; fortunately, health and nutrition education is one way to help students understand the importance of physical activity and eating a balanced diet that includes fruits and vegetables.

Method

In response to the dire need of increased health and nutritional awareness in Mississippi, sponsors established the Art of Living Smart Camp (AOLS) for children from ages six to thirteen. The camp, operating through a local museum in the Mississippi delta, fosters health and nutritional education through an encouraging exploration of cultural arts. AOLS has operated annually each summer since its initial camp in spring of 2010. The camp’s goals are aimed at enabling children to make healthier lifestyle choices that will “enhance their success in school and lives overall” (p.2) by providing students with opportunities to explore health related concepts and by offering activities and materials to families (Bennet, Shackleford, & Brown, 2012).

In each two-week AOLS camp, children attend either the morning or afternoon session and engage in classes that include dance, music, physical fitness, creative writing, culinary arts, nutrition, and arts and crafts. To do this, meals, snacks, and cooking classes introduce campers to many fruits, vegetables, low fat dairy products and sugar free drinks. Dietetics students at a local regional university teach the nutrition and culinary classes, which focus on topics such as weight management, fruits and vegetables, healthy snacks, and a class designed especially for the camp entitled Down with Disease, which emphasizes the importance of chronic disease prevention. Other lessons were Don’t Drink your Calories and Get the Junk Out of Your Trunk, which focused on limiting sugar sweetened beverages and empty calorie snack foods.

Not only were the children given healthier choices to try each day of the camp, but each day’s morning campers also received a healthy breakfast and a mid-morning snack while the afternoon campers received a nutritional lunch and an afternoon snack. The culmination of the four-week camp was the Grand Finale, a program for the campers’ families that highlighted songs written and sang by the children about healthy lifestyles. Some campers recited poems they had written and all campers performed choreographed dances together. Following the
program, parents and campers received invitations to a reception to see the children’s artwork and enjoy healthy drinks and snacks that the campers had helped prepare.

Participants

A peak total of 76 African American children from ages six to thirteen years participated in the program with half the children attending camp Monday through Friday mornings from eight o’clock a.m. through noon and the other half attending Monday through Friday afternoons in June from one until five o’clock p.m. Participants were from the local surrounding area in the Mississippi Delta and were grouped according to age with the six, seven, and eight year olds comprising the youngest group, the nine and ten year olds in the middle group, and the 11-13 year old students in the oldest group. The male-to-female ratio of campers was approximately 60 percent female and 40 percent male, with the 11-13 year group being female.

Materials and Procedures

Instruments. Three developmentally appropriate surveys served to collect data both before and after the AOLS camp. These surveys included the ‘Fruit, Fruit Juice, and Vegetable Preferences’ (FJV-P) (Jaramillo et al., 2006), the ‘Knowledge of Fruits and Vegetables’ (FJV-K) (Baranowski et al., 2000), and ‘Physical Activity and Me’ (PA) (Sherwood et al., 2004), which provided us with information of campers’ initial beliefs, knowledge, and attitudes, respectively, regarding healthy foods and physical activity. While the FJV-K (Baranowski et al., 2000) had a strong alpha reliability of .77, the PA (Sherwood et al., 2004) Cronbach’s alpha was only slightly lower with 0.67 and test-retest reliability of 0.56. Finally, the FJV-P (Jaramillo et al., 2006) had the strongest scores with an internal reliability of .87 and test-retest reliability of 0.73.

Camp. Increasing fruit and vegetable intake and physical activity were the main focal points of the camp because research (Lin & Morrison, 2002) showed that when children increased both fruit and vegetable intake and physical activity, the health benefits included healthier weights, and therefore decreased risk of diabetes, hypertension, cardio-vascular disease and certain types of cancer. On day one of the 2012 AOLS camp, nutrition and dietetics undergraduate students administered three brief surveys to each student in the three age groups. During the camp, participants took cooking classes where they prepared and ate daily snacks. Nutrition education occurred throughout each day’s activities, where campers participated in lessons with an emphasis on increasing fruit and vegetable intake as well increasing physical activity. On the last day of camp, campers again completed the surveys to provide post-test information about possible attitude and/or behavior changes because of the camp education and experience.

Results

Due to fluctuations in group size and participation along with the lack of matched pairs for each of the questionnaires’ first and second administrations, data analysis was accomplished by the use of chi-square statistics of participant responses by age for before and after camp comparisons. On the FJV-P (Jaramillo et al., 2006), campers ranked 44 different fruits, juices, and vegetables into 3 categories: 1) do not like at all, 2) like a little, 3) like a lot both before and after the AOLS camp. Results from each administration indicated a significant association
between age and likability with chi-square values of $X^2_{(4, N=64)} = 108.41, p < .000$ and $X^2_{(4, N=76)} = 28.29, p < .000$, respectively. Adjusted standardized residuals identified strong contributions from eight of the nine possible response combinations among all three age groups before camp while only one contributor from both the middle and older group responses were noteworthy for the after camp analysis, in each case indicating a clear deviation from the expected responses for the contributing age groups.

Crosstabulations of participant responses on the first and second completion of the FJV-P further illustrated how students’ ages strongly correlated with their expressed preferences before the AOLS camp and notably less influence after camp. While approximately one third of the nine and ten year olds as well as the 11-13 age group reported liking fruits, fruit juices, and vegetables a lot on the first administration, the youngest age group’s responses were just the opposite with nearly half reporting they did not like these nutrient dense foods. For the second administration, however, well more than half of the participants in all three groups indicated their increased affinity for the food types, with the youngest age group showing the largest gains in the like a lot category. For all three age groups, campers’ pre- and post-camp FJV-P results are displayed in Table 1.

Table 1

<table>
<thead>
<tr>
<th>Age</th>
<th>Do not like</th>
<th>Like a little</th>
<th>Like a lot</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
<td>Change</td>
</tr>
<tr>
<td>6-8</td>
<td>48.7</td>
<td>2.4</td>
<td>-46.3</td>
</tr>
<tr>
<td>9-10</td>
<td>28.7</td>
<td>2.0</td>
<td>-26.7</td>
</tr>
<tr>
<td>11-13</td>
<td>24.2</td>
<td>6.5</td>
<td>-17.7</td>
</tr>
</tbody>
</table>

Note. Age is in years; responses and change scores are in percentages.

For the PA (Sherwood et al., 2004) questionnaire, a similar association was evident with regard to each age group’s perceived difficulty of nine items related to physical activity. When students responded whether activities were 1) not hard at all, 2) a little hard, or 3) very hard, a significant chi-square value $X^2_{(4, N = 51)} = 14.51, p < .006$ was detected at the .001 level for the before camp association between age and responses. A significant association in the after camp perceptions was observed ($X^2_{(4, N=75)} = 40.84, p < .000$). Adjusted standardized residuals for the PA also illustrated strong contributions from all three age groups’ initial responses but only from the young and middle groups for the subsequent completion, indicating a lower association between older participants and their perceptions in the after camp condition. Table 2 presents the results of the chi-square analyses.
Table 2

Significance of the PA (Sherwood et al., 2004) and FJV-P (Jaramillo et al., 2006)

<table>
<thead>
<tr>
<th>Occasion</th>
<th>Physical Activity &amp; Me</th>
<th>Food Preferences</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$X^2_{(df, N)}$</td>
<td>$P \leq$</td>
</tr>
<tr>
<td>pre</td>
<td>14.51( (4, 51) )</td>
<td>0.006*</td>
</tr>
<tr>
<td>post</td>
<td>40.84( (4, 75) )</td>
<td>.000*</td>
</tr>
</tbody>
</table>

Note. *$p < .05$

Clearly, campers in youngest and middle age groups experienced real differences in attitudes regarding exercising and the level of difficulty of the nine tasks from the first to the second completion of the PA. Initially, all ages reported a low level of difficulty for most tasks, with approximately half of all groups stating that the noted activities were not at all hard. After the AOLS camp, however, even more participants in the youngest and oldest groups indicated a lower level of perceived difficulty while also reporting fewer items as either a little or very hard. Interestingly, the middle group of participants saw a reversal of scores, with less reported ease and more items perceived as a little hard while there were nearly no changes in perceptions of tasks that are very hard. Similar to the FJV-P, the youngest group realized the largest gains on the PA, as noted in table 3.

Table 3

Student responses regarding activity difficulty level on the Physical Activity and Me (PA) (Sherwood et al., 2004) questionnaire

<table>
<thead>
<tr>
<th>Age</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Change</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Change</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-8</td>
<td>49.3</td>
<td>71.0</td>
<td>21.7</td>
<td>25.0</td>
<td>24.2</td>
<td>-0.8</td>
<td>25.7</td>
<td>4.8</td>
<td>-20.9</td>
</tr>
<tr>
<td>9-10</td>
<td>63.6</td>
<td>47.2</td>
<td>-16.4</td>
<td>19.4</td>
<td>36.2</td>
<td>16.8</td>
<td>17.1</td>
<td>16.5</td>
<td>-0.6</td>
</tr>
<tr>
<td>11-13</td>
<td>57.6</td>
<td>65.4</td>
<td>7.8</td>
<td>31.3</td>
<td>28.8</td>
<td>-2.5</td>
<td>11.1</td>
<td>5.9</td>
<td>-5.2</td>
</tr>
</tbody>
</table>

Note. Age is in years; responses and change scores are in percentages.

In the third questionnaire, campers were tested both before and after camp on their knowledge of fruits and vegetables with the FJV-K (Baranowski et al., 2000), which includes 16 multiple-choice formatted questions with five response options. Questions pertaining to the nutritional value and benefits of healthy eating quiz children’s knowledge of basic nutrition related information, such as the number of recommended fruit and vegetable servings one should
eat each day. Once again, results illustrated the largest positive gain in nutrition knowledge for the youngest age group due to the AOLS camp experience and classes, with the middle age group close behind. Table 4 presents the results for all three groups.

Table 4

Correct responses on the Knowledge of Fruits and Vegetables (FJV-K) (Baranowski et al., 2000) questionnaire

<table>
<thead>
<tr>
<th>Age</th>
<th>Pretest</th>
<th>Posttest</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-8</td>
<td>28.2</td>
<td>78.0</td>
<td>49.8</td>
</tr>
<tr>
<td>9-10</td>
<td>31.12</td>
<td>75.0</td>
<td>43.88</td>
</tr>
<tr>
<td>11-13</td>
<td>53.9</td>
<td>78.0</td>
<td>24.1</td>
</tr>
</tbody>
</table>

Note. Age is in years; test scores are in percentages.

Discussion

The two-week Art of Living Smart summer camp was in its third year of operation when participants in three age groups received three questionnaires both before and after camp to detect any differences between initial and subsequent opinions and perceptions of nutritious foods and physical activity. The nutrition knowledge data that resulted from the FJV-K (Baranowski et al., 2000) was most encouraging as each age group had a failing average score when camp began but by the end of camp, each group had a passing average score. Additionally, both of the younger age groups, which included participants six to ten years of age, yielded the most improvement. The fact that each group started out with a failing score illustrates the need for nutrition education and healthy lifestyle information among these participants from the Mississippi Delta.

For the PA (Sherwood et al., 2004), results were somewhat conflicting with the younger and older participants’ responses showing real gains whereas the middle group participants’ responses actually regressed as they indicated a higher level of perceived difficulty of physical activity-related tasks. Further, the relationship between age and PA responses as shown by significant chi-square results remained fairly constant both before and after camp, however the large contributions dispersed among age groups in the initial analysis were not fully present in the second, as there were no strong contributors from the older group responses. These data indicate that the AOLS camp was most successful in changing younger participants’ attitudes on the difficulty of exercise, but further progress and efforts need to be made in reaching the middle group demographic.

The youngest age group also achieved the largest gains in fruit, juice, and vegetable likability (FJV-P) (Jaramillo et al., 2006) after camp while the middle group revealed notable differences as well and the older age group following closely behind. When coupled with the significant relationship between age group and response illustrated by chi-square analysis and the resulting residuals, it is clear that age played the largest role in participant responses before the
AOLS camp with regard to student preferences of nutritious foods. Campers of all ages reported liking more fruits and vegetables at the camp’s end, which was likely due to the exposure to new foods through snacks, cooking activities, and nutrition classes.

As Mississippi’s food desert status will not likely change in the near future, it is imperative to make efforts toward bridging the gap between the state’s residents and nutritious foods such as fruits and vegetables. Simply being aware of fruits and vegetables is not enough, however; individuals must understand and take ownership of the importance of making smart food choices in everyday situations, which means we not only need an informational shift, but also an attitudinal one. With promising empirical literature, that illustrates the cognitive, developmental, and academic benefits of improved nutritional intake (Taras, 2005), there is no time to lose.

Overall, the Art of Living Smart Camp had the largest impact on the six to eight year old participants in all three areas, including the likability of fruits and vegetables, knowledge of fruits and vegetables, and the perceived difficulty of tasks associated with physical activity. These data are particularly pertinent as this age group makes dietary changes easier than older children are because the earlier weight management is established; the less likely they are to carry obesity into adulthood (Guo, Chunlea, & Roche, 2002). Future studies should gather additional information regarding participant demographics and food availability both at home and in local eateries as well as the number of supermarkets nearby. Closer analysis of fresh fruit and vegetables offered in government-sponsored environments such as schools/daycare would also be beneficial, as “gray-green canned peas, rubbery canned fruit” or a “sorry-looking salad” (p. 79) are neither appetizing nor adequate for reaping the benefits of a nutrient rich diet (Saul, 2006).

References


