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For the Mouths of Babes: Nutrition Literacy Outreach to a Child Care Center

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Abstract

Childhood obesity is at crisis levels in the United States. Risk factors for obesity can begin as early as infancy. Approximately 12 million children up to five years of age spend about 22.5 hours per week in child care centers where they receive a significant portion of their daily nutrition. Child care center personnel may not know how to select nutritious meal and snack choices. A health sciences librarian, a child care center director and a dietitian designed an outreach program on nutrition that helped child care center teachers gain increased nutrition literacy. The teachers indicated that they gained increased personal understanding of formerly confusing nutrition issues (e.g., how to read a nutrition label and what defines a whole grain). Teachers were also able to identify aspects of web sites linked from MedlinePlus that indicated the sites served as reliable sources of health information.

Introduction and Background

Although childhood obesity is declining slightly in some states in the U.S., it is still a significant problem. Oregon and New Jersey have the lowest percentage of obesity among children in the U.S., ranging from 5.1% to 10%. Georgia, on the other hand, has some of the highest rates of obesity. In 2011 in Georgia, the percentage of obese children ranged from 15.1% to 20% (National Conference of State Legislatures 2014). Nationally, it has been shown that one in four children ages two through five years are overweight or obese (Ward, Vaughn and Story 2013). Obesity begins early in life and it has been linked to poorer cognition and self control in children (Ryan, Fauth and Brooks-Gunn 2006). Young children who are overweight or obese are increasingly at risk for diseases that were, during earlier times, only seen in adults. Children are more than ever at risk for diseases such as heart disease, high blood pressure and Type 2 diabetes (Center Helping Obesity in Children End Successfully, Inc. 2014). The childhood obesity epidemic may result in a reduction in life expectancy (Po'e et al. 2013). According to some, obesity is the most prolonged pediatric illness (Lyn et al. 2014). Children's food preferences and activity levels are established at a young age and evolve around family and cultural preferences, beliefs and attitudes (Savage, Fisher, and Birch 2007). Some researchers suggest that the in utero environment along with genes and epigenetics can influence whether a child will become obese (Rhee, Phelan, and McCaffery 2012). The challenge for parents and child care providers is, when the infant is

ready for table foods, to introduce new foods that are healthy and provide children with plenty of physical activity and floor activities during infancy.

Many parents and child care providers do not understand that young children will frequently reject new foods because they naturally have a tendency toward sweet, bland and familiar foods, a concept referred to as neophobia (Cooke, Hayworth and Wardle 2007). Many adults do not understand the importance of physical activity throughout childhood. Ginsberg (2007) suggests that in spite of the many important gains that result from play, time for free play, including physical activity, has been significantly decreased for some children. Early intervention in the home and child care setting can help children to establish healthy eating and activity levels at a very young age. However, many people may not understand proper nutrition or realize that their eating and/or activity habits may be unhealthy. For example, Glanz, et. al (1998, p. 1118) state: "Dietary patterns of Americans differ widely, but most Americans eat a diet that could best be described as in need of improvement."

Recent research suggests that the child care environment may serve as an excellent place to promote healthy nutrition and physical activity practices (Lyn et al. 2013). Approximately 12 million children up to five years of age spend about 22.5 hours per week in child care centers (Lyn et al. 2014) where they receive a significant portion of their daily nutrition. The Child and Adult Care Food Program (CACFP) subsidizes nutritious meals and snacks for children in centers eligible for the reimbursement. Children are eligible to receive up to two meals and a snack that meet the USDA requirements (FRAC 2014). While the USDA lists required components and serving sizes, the quality of the food is not prescribed. For example, in the grains/bread category, choices such as cornbread, biscuit, roll or muffin are listed. One might speculate a wide range of nutritional quality would be involved in the choices made by center and family home care providers. Further, little is known about how child care center directors and teachers influence the nutritional choices offered to children. Little is known about the nutrition knowledge base of directors and teachers at centers serving young children in full-day programs, or if child care center personnel know how to select nutritious meal and snack choices. The question the current authors proposed to answer was: Could a program on nutrition be designed that teachers and directors would embrace and that would result in healthier choices at the center?

Setting

Georgia Regents University (GRU), a comprehensive four-year university located in Augusta, Georgia, consists of both a health sciences campus/academic medical center and a liberal arts campus. On the health sciences campus, GRU operates a child care center for children of its faculty, staff and students. The Child Care Center, established in 1988, has planned programs for each child's level of development and a variety of learning and play activities are scheduled for children, based upon age level. Nutritionally balanced lunches are served daily, in addition to breakfast and morning and afternoon snacks. The Center is licensed by the State of Georgia. It is a 3-star Georgia Quality Rated center (the highest designation) and is accredited by the National Association for the Education of Young Children (NAEYC). Eleven full-time teachers, five permanent substitute teachers, an assistant director and the director are responsible for approximately 90 children who range

from 6 weeks through preschool age. The hospital prepares the lunches for the center, which are delivered each day. The center has always followed the USDA and CACFP food guidelines. However, some meals served included processed foods, high fat foods, and canned fruits instead of fresh fruits. Additionally, 100% juice was served each day.

Because of her concern about the nutritional content of the menu, the director decided to establish a wellness committee, comprised of faculty, parents and a teacher, for the center in order to address nutrition and physical activity issues. Simultaneously, the director and a medical librarian on campus became acquainted when the librarian enrolled her child in the GRU Child Care Center. From 2009 to spring of 2013, the child of the Area Health Education Centers (AHEC) Program librarian, who works on the health sciences campus, attended the child care center. As an involved parent of the center, she witnessed the center director's ongoing efforts to improve nutritional offerings at the center. She became a parent representative on the center's wellness committee and became equally committed to improving the nutritional choices offered at the center.

Previous Grants

As the child care center's wellness committee began to look at nutrition and physical activity issues, Bright from the Start: Georgia Department of Early Care and Learning (DECAL), the agency that oversees child care licensing and Georgia's nutrition program, began voicing concern about the rates of obesity in Georgia's youngest children. In an effort to provide opportunities for improving nutrition and physical activity in child care centers and family homes and in an effort to offer financial resources for intervention in the childhood obesity arena, DECAL published a request for proposals for wellness grants to child care center and family day care home directors in 2011. The GRU Child Care Center Director worked with the center's Wellness Committee, which included the authors, to provide input for the proposal. The proposal was submitted by the director and approved for funding by DECAL. The total grant amount was \$3,000.00 with a one-year timeline.

The grant funding from DECAL was used to change the center's 3-week rotating menu, provide education to parents and children in the areas of nutrition and planned physical activity, increase planned and unplanned physical activity for staff and children, purchase gardening materials and equipment, and be more proactive with family-style serving practices. The director worked with the hospital cafeteria chef to change the 3-week, rotating menu. The end result involved daily family-style dining for the preschool classrooms, the planting and harvesting of a garden, physical activity for a significant portion of the day, and the elimination of all processed foods and foods high in fat and or sugar. The center also adopted the American Academy of Pediatrics' policy on treating juice as a dessert. The center now serves 100% juice once each week only.

Health Literacy Pilot Project Award

In early 2013, an opportunity arose to extend the work at the child care center in the areas of nutrition and physical activity. Thus, the collaboration between the librarian, who had prior experience with outreach projects, the child care center director and teachers was extended. The National Network of Libraries of Medicine/Southeastern Atlantic Region (NNLM/SEA)

offers outreach awards to its member libraries for projects related to health information literacy and outreach to underserved populations. Child care workers are defined by NN/LM as an underserved population that would benefit from learning to use mobile technology in the classroom as well as from increased health literacy. The Robert B. Greenblatt MD Library at GRU, at which the AHEC librarian is a faculty member, is a long-time NN/LM member. The librarian and the child care center director wrote a proposal for the NN/LM's Health Literacy Pilot Project award, outlining a nutrition literacy project for the child care teachers at the center. The award was granted in April 2013. The award amount was \$5,000.00 with a one-year timeline.

The primary project goal was for Child Care Center workers at Georgia Regents University to gain improved nutrition and health literacy in order to complement current wellness initiatives at the Center. The assumption was that infants and children under the staff's care, who represent a diverse group of nationalities and ethnicities, as well as the staff and the children's families, would benefit from gaining additional information to establish healthy eating and physical activity habits early in their lives.

The librarian, child care center director and a registered dietitian (who had previously worked with GRU faculty on another project) designed a training plan for the literacy grant. Five 60-minute sessions would be offered to all full-time employees of the center, who would receive payment for attending the sessions. Training was scheduled after regular work hours since the teachers were fully involved with caring for the children during regular center hours. The educational content of the five sessions is shown in Table 1. The Center lacked computer equipment for use in classrooms, and typical laptops or desktop computers did not offer the flexibility required in a child care environment. NN/LM grant projects often feature a combination of purchased technology and training in information literacy. The project partners determined that mobile technology, specifically tablets, would be the best option both in terms of free applications and content as well as offering an intuitive interface.

Project Implementation

At the first session, the child care center staff were pre-assessed by the Director and librarian on their level of understanding of nutrition literacy. To minimize the burden on the center, the librarian and Greenblatt Library administrative staff provided administrative support for the award. Once the award funds became available, six iPads were purchased for the center, one for each classroom. Previously, the center had only one classroom with a computer for staff use (the Pre-K room). The librarian configured the iPads for the university's wireless system and bypassed the usual iTunes requirement for credit card data. Two teachers in each classroom would share each iPad and therefore such personalization was not needed. An icon for the National Library of Medicine's consumer health site, MedlinePlus, was placed on the first screen of each iPad as well, for ease of use in training sessions. The child care center used their regular supply funds to purchase shockproof and drop-resistant case covers for each tablet.

The dietitian and librarian determined the content and amount of time to devote to each topic/activity within each of the five 60-minute sessions. Additionally, time was allotted during each session for questions and answers. The librarian emphasized the need to make all learning activities highly interactive; teachers either followed along or worked independently on the iPads. Other sessions involved other materials, such as life-like plastic food, which the center owned. Content for the sessions is outlined in Table 1

Sessions were conducted in a classroom setting at the child care center. The librarian and the dietitian presented information and led activities designed to increase the workers' nutrition literacy. Content from the MedlinePlus web site was featured extensively during the sessions. The dietitian lead sessions on current nutrition issues, and the librarian instructed the teachers in the use of the iPads, MedlinePlus, and NLM's Guidelines for Healthy Web Surfing. The teachers at the center had varied levels of computer literacy; some were already owners of tablets or smartphones for personal use, while others had little or no experience with mobile devices. Fortunately the small size of the group (eleven teachers) allowed for more individualized attention when needed. The teachers with more computer experience would also voluntarily assist their colleagues with basic device functionality skills during sessions when needed. [black and white photo (group.tiff)]

Additionally, printed materials related to nutrition literacy were provided in a display unit at the center, to serve as a one-stop nutrition information site for parents and staff. Materials appropriate for both small children, such as board books, and adults, such as ChooseMyPlate laminated placemats, were purchased with award funds and displayed at the center for the children's family members to take home.

The partnership worked extremely well together with minimal problems. The only difficulty during grant period was an organizational one: the university's Human Resources/Accounts Payable required a large amount of paperwork before the teachers could receive their stipends at completion of the project [all teachers who attended at least 4 sessions received \$100 (pre-tax)].

Evaluation and Outcomes

All eleven teachers and the director attended at least 4 of the 5 hour-long sessions. Comparison of our pre-and post-test scores showed much improvement in the areas of information literacy and health literacy. (Test questions provided in Appendix A.) Of the five multiple choice questions on the assessment tool, most teachers scored less than 3 of 5 correct answers on the pre-assessment. When given the post-test, most teachers scored more than 3 correct answers (Table 2).

The teachers indicated that they gained increased personal understanding of formerly confusing nutrition issues (e.g., how to read a nutrition label and what defines a whole grain). Teachers were also able to identify aspects of web sites linked from MedlinePlus that indicated the sites served as reliable sources of health information. The dietitian also incorporated content from MedlinePlus into her final session, although she had not been required to do so.

One teacher (JH) commented: “I like the fact that going to MedlinePlus for medical and nutrition information provides information only from secure sites. Also, I was clueless about caloric and water intake needs. Now I’ve transferred my learning from these classes to my practices with my family and the children at the center. Now I try to serve the My Plate categories and portion sizes. I now read labels on products in the grocery store before making a decision about purchasing items.”

Another teacher (SM) stated: “I learned a great deal. I found out that a lot of foods I classified as healthy were actually not healthy.”

At the conclusion of the project, the teachers were asked to identify ways to incorporate nutrition literacy in the classroom, at levels appropriate for small children (6 weeks through preschool) and their families. Each teacher provided input that included the importance of family-style dining, the importance of reading labels, and the importance of serving sizes using the “MyPlate” model.

The computers are permanently located in each of the six classrooms of the center for workers to use when sharing nutrition and other caregiving resources with parents and caregivers. The teachers are also free to use the iPads in any other manner appropriate in the classroom, such as for music, physical activity, and other educational ideas. More and more frequently, the teachers are using the camera feature to document the children’s activities. For example, the first day an older infant tried black-eyed peas, the teacher took a picture of his first bite and sent it home to Mom. Mom said, “That picture melted my heart.”

In addition to sharing photographs of children’s milestones, the teachers use the iPads with parents in other ways. For example, the child care teachers interact with all parents upon arrival and departure. They also conduct parent-teacher conferences biannually. These interaction times provide a perfect venue for dissemination of information to families. Prior to the purchase of the iPads, teachers at the Center had limited means for sharing reliable health and wellness information with parents. Use of these mobile devices eliminates barriers to sharing information and provides reliable health information through MedlinePlus, which is known for providing information at many reading levels and in many languages. The librarian continues to provide updated information resources for the nutrition literacy display area. For example, when a local farmer’s market in the urban core of Augusta hosted a back-to-school edition of its weekly market, the librarian printed out flyers from the market’s social media site and brought them to the child care center for display. Free downloadable documents on nutrition and healthy lifestyles, from early childhood education publishers, are also reproduced and provided for the display.

In mid-2014, the librarian became the embedded librarian for the GRU Institute of Public and Preventive Health. Embedded librarians at GRU have office hours in a particular college or institute and provide specialized services (teaching, research, grant support, etc.) to that customer group. The child care center director is also a section chief in this institute. The close working relationship and new proximity to each other has allowed for continued collaboration between the director and the librarian, who continue to investigate further

funding for similar projects, and to disseminate information about their nutrition literacy project.

Discussion

Food preferences and physical activity levels are determined early in life. With childhood obesity at crisis levels, outreach to this child care center helped the teachers understand the importance of good nutrition for themselves and the children and families served by the center. It is critical to establish childcare environments that support regular physical activity and healthy eating habits before children develop poor eating habits (Ward et al. 2013).

Several study limitations should be acknowledged. First, pre- and post-tests employed in the study were developed by the authors and thus were not standardized in any way. Second, the study also has a relatively small sample size. Despite these limitations, however, the overall outcome of the project has excellent implications for collaborations between child care center directors and librarians in the context of enhancing the nutrition curriculum for teachers of young children and their families.

While the director has made decisions in the past regarding food choices for the children and policies regarding food brought into the center by the teachers, we believe that the information provided by our project increased the teachers' willingness to support and participate in healthy food and activity choices both at the center and at home. As Lyn et al. (2013, p. 1) state: "The child care environment has emerged as an ideal setting in which to implement policies that promote healthy body weight of children."

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Appendix A: Assessment tool

Health Literacy pre- and post-test questions

1. To judge the quality and reliability of a health information web site, you look for the following: (check all that apply)
 - a. Dates when the site was last updated or reviewed
 - b. Names of the person or group that wrote the information
 - c. Whether or not advertisements are clearly marked as such (“from our sponsors” or “advertisement”)
 - d. A way to contact the author or webmaster
 - e. Credentials of the person or group that wrote the information
2. To find reliable health information on the Internet, the BEST place to start would be:
 - a. Google
 - b. WebMD
 - c. The GRU homepage
 - d. MedlinePlus
 - e. Yahoo!
3. You want to give a parent of an infant information on breastfeeding and the use of infant formula. Which type of web site would you recommend? (choose up to two answers)
 - a. A web site run by an infant formula maker, such as Similac
 - b. A web site run by a nonprofit group that advocates for breastfeeding, such as La Leche League

- c. A web site run by physicians, such as the American Academy of Pediatrics
 - d. A web site such as MedlinePlus, with a variety of links to information
 - e. A parenting web site, such as www.babycenter.com, with a variety of links to information
4. If you have diabetes, which of the following advice comments should you follow? Check all that apply.
- a. Limit foods that are high in sugar
 - b. Eat smaller portions, spread out over the day
 - c. Eat fast food no more than twice a day
 - d. Be careful about when and how many carbohydrates you eat
 - e. Eat a variety of whole-grain foods, fruits and vegetables every day
 - f. Eat less fat
 - g. Limit your use of alcohol
 - h. Use less salt
5. What is the treatment for Celiac Disease?
- a. Eat lots of wheat, rye and barley products
 - b. Follow a gluten-free diet
 - c. Have your small intestine removed

Table 1

Session	Content
Week 1	(librarian) iPad setup: obtaining an Apple ID, how to download apps from the App store; introduction to MedlinePlus; pretest
Week 2	(dietician) Adult nutrition: ChooseMyPlate guidelines, fake food exercises (sorting foods into categories of protein, carbohydrates, fats, fruits and vegetables, starchy and non-starchy vegetables; designing a personal plate according to ChooseMyPlate model)
Week 3	(librarian) Overview of MedlinePlus Health Topics pages “Infant and Newborn Nutrition” and “Child Nutrition”; and introduction to NLM Guidelines for Healthy Web Surfing criteria for evaluating reliability of health-related web sites (dietician) Adult nutrition: reading nutrition labels, defining and identifying whole wheat and products containing whole grains
Week 4	(dietician) Child and Infant nutrition: breastfeeding and milk storage, formula feeding, whole foods for children (librarian) review of criteria for evaluating reliability of health-related web sites; teachers instructed to use criteria to evaluate child and infant nutrition web sites linked from MedlinePlus for reliability, explain to group how a particular site meets criteria
Week 5	(dietician and librarian) Questions and Answers/review; post-test

Table 2

Pre-test and Post-test scores