Nutrition Education for Children

A Practical Method for Teaching and Assessing Nutritional Knowledge in Elementary School Children

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Abstract
Knowledge of nutrition, such as servings per day, naming fruits and vegetables, and how food gives energy, are important to learn in promoting a healthier lifestyle. Health educators should be using methods to ensure that students have knowledge of what should and should not be put into their bodies. This is important as their family may not have the education to know what their child’s nutritional needs are (Baskale & Bahar, 2011). Therefore, the purpose of this article is to present a review of school nutrition education interventions in Oklahoma before providing a two-lesson plan to educate elementary children on nutritional topics. In addition, this article provides an effective method for assessing the effectiveness of the lesson plans, which are easily integrated into other subjects such as math and reading. Lessons and assessments are provided with an explanation of how they should be used in order to determine improvement of children’s nutritional knowledge immediately following the lessons as well as long-term.

Childhood Obesity
Obesity in children in the United States is an epidemic, with approximately 32% of children and adolescents being overweight (Osborne & Forestell, 2012). Portion size increases over the last three decades (Cohen & Bhatia, 2012) in addition to over consuming high energy and low-nutrient dense food are in part contributors. Further, when individuals are presented with excess calories, they are more likely to eat more, do not eat less at other meals, and continue to calorically over consume.

Obesity is becoming more and more prevalent in America’s youth. This is problematic because obese children typically stay obese as adults, which can lead to morbid obesity (Osborne & Forestell, 2012). Side-effects of obesity can include type 2 diabetes and other metabolic risk factors (Ritchie, Raman, Sharma, Fitch, & Fleming, 2011).

Not all children are at risk of being overweight or becoming obese; the most at risk for developing obesity or being overweight are children of lower socioeconomic status (Zarnowiecki, Sinn, Petkov, & Dollman, 2011). Healthcare workers may not get the chance to see the child, due to the parent’s work schedule or finances. Dalton, Schetzina, Holt, Fulton-Robinson, Ho, Tudiver, McBee, and Wu (2011) state that healthcare providers recognize and treat less than 20% of overweight children. This is often due to time constraints which prevent the discussion on how to execute an ‘eat-less, exercise-more’ prescription and may hinder the initiation of any behavior changes (Dalton 2011). Thus, obesity statistics will continue to
rise until there is a national intervention on food regulation and nutrition education.

**Performance in School**

Nutrition effects how children perform in school. Not only do all children need the opportunity to have a well-balanced diet, but according to Farfan-Ramirez, Diemoz, Gong, and Lagura (2011), a child with proper nutrition has a higher ability to fully participate in school and learn. For example, Murphy and colleagues (1998) found that children who were hungry and at risk for being hungry were twice as likely to have impaired functioning and were two to three times more likely to have emotional problems. Further, Meyers, Sampson, Weitzman, Rogers, and Kayne (1989) reported that students participating in the school breakfast program had lower tardiness and absence rates than those who did not. It is encouraging that academic performance can be improved with school nutrition education combined with other programs that promote wellness (Farfan-Ramirez et al., 2011). Thus, it is important that health education includes nutrition as a core component.

**How Nutrition Improves Making Healthier Decisions**

Children need nutrition knowledge to make healthier food choices, and knowledge, in relation to eating and nutrition, is “defined as the understanding of the health benefits of food and nutrients” (Zarnowiecki et al., 2011, p. 1284). Nutrition knowledge is becoming increasingly important in food choices; associations shown in studies between knowledge and eating behaviors show that with nutrition knowledge, healthier eating behaviors may occur (Zarnowiecki et al., 2011). According to Osborne and Forestell (2012), “Although children understand that nutritious food contributes to a healthy body, they are generally not concerned about their health and second, children appear to believe that healthful foods are unpalatable” (p. 363). Thus, teaching children about nutrition is one of the most important subjects learned early in life with evidence suggesting that “diet during childhood may have important implications for the development of obesity and other chronic disease in later life” (Ritchie et al., 2011, p.236).

If children can learn what kind of diet they should be eating, they have a higher likelihood of making healthier decisions by eating more fruits, vegetables, dairy, and bread and less fatty low-nutrient foods (Baskale & Bahar, 2011). Baghurst and Eichmann (in press) recently reported that a school-based nutritional education curriculum can improve student self-efficacy. Thus, impressing upon children the importance of nutrition in their early years is paramount because they are still determining lifelong food preferences and eating habits (Zarnowiecki et al., 2011).

**Nutrition Requirements in Oklahoma Schools**

There are no current standards on teaching nutrition specifically in the state of Oklahoma. Although there are health standards, they do not specifically address nutrition. Standard Three states that: “The student will demonstrate the ability to practice health-enhancing behaviors and reduce health and safety risks” (Oklahoma Board of Education, 2013). This standard can be used to help address children’s’ nutritional knowledge requirements even though there are no specific standards for nutrition.

**School Interventions in Nutrition Education**

School health and physical education classes provide an opportunity to incorporate nutrition education into the curriculum. There are a variety of nutrition education programs that can be implemented in the schools that are easy to use and will help young students acquire healthy nutritional habits early in life (Agozzino, Del Prete, Leone, Manzi, Sansolone, & Krauss, 2007). According to Agozzino et al., “a substantial percentage of children do not demonstrate correct nutritional intake and therefore nutrition education interventions are more opportune and necessary than ever” (p. 275). However, to be successful interventions must include sharing commitment and setting health goals with the school community (Bisset, Potvin, & Daniel, 2013).

Children have the opportunity to learn how to healthily replenish their bodies through nutrition education programs in school. With society becoming busier and relying more on convenient meals (French, Story, & Jeffery, 2001), nutrition education has never been so important in schools. With over one third of the adult American population being obese (Wilson, Crosnoe, & Daniels, 2012) failing to educate children about proper nutrition will likely yield to continual deleterious consequences. Thus, the purposes of this article are to provide: a) a curriculum with two practical lessons for teachers seeking to incorporate nutritional education into their classroom, b) an example of how knowledge gained can be assessed, and c) an example of how and when these lessons can be delivered.

**Curriculum and Lessons**

In this example, the USDA Fresh Fruit and Vegetable Curriculum developed through the Fresh Fruit and Vegetable Program (FFVP) approved by Congress.

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Lesson Plan One
The first lesson, “Focus on Fruits and Vary Your Veggies” (p. 99-100), integrates math to help develop fluency in addition and subtraction and to identify patterns. Included in the curriculum are several teacher resources as well as handouts that are included at the end of the lesson for homework (p. 10-14; 17; 19-38). The focus of the lesson is for students to create a list of fruits and veggies that they eat, whether it is from a garden, raw, cooked, or on a pizza. The students should also give reasons as to why it is important for them to eat many fruits and veggies every day.

There are seven key points that need to be addressed in this lesson: eating a lot of fruits and veggies every day helps us stay healthy; fruits and veggies are excellent sources of many nutrients, including vitamins A and C, potassium and fiber; vitamin A keeps eyes and skin healthy and helps to protect against infections; vitamin C helps heal cuts and wounds and keeps teeth and gums healthy; fiber keeps food moving through the digestive tract; most fruits and veggies are naturally low in fat and calories and do not contain cholesterol; and MyPyramid tells us how many fruits and veggies we need to eat every day.

The handouts in the curriculum can expand students’ knowledge on important nutrients that fruits and veggies contain. One example determines if the students can identify what type of nutrient would be in their favorite types of fruits and veggies. The “Vegetable Menu” (p. 101-102), “Boxing Fruits and Veggies” (p. 103-104), and “Which Fruit?” (p. 105-106) handouts can be provided as homework.

Lesson Plan Two
The second lesson, “My Fruit and Veggie Goals” (p. 107-108), integrates language arts to foster students’ use of phonics knowledge, using text for a variety of reasons, explaining things in their own words, and using oral communication. The same resources (p. 10-14; 17; 19-22; 28-38) in the curriculum, except for the MyPyramid resources (p. 23-27), can be used for this lesson also. This lesson focuses on asking students about the types of fruits and veggies they have eaten at school, which ones they liked, and why they liked them. Students are also expected to discuss ideas on how to eat more fruits and veggies outside of school and they should be reminded that eating a variety of fruits and veggies is important.

There are only two talking points for this lesson. First, set realistic and achievable goals. For example, if only corn and apple juice are what is being offered, try adding one new fruit this week. Second, take one step at a time. No one expects a complete change in eating habits to happen overnight. Therefore, the student should be encouraged to try making one new, positive change and then continue to make gradual changes over time.

After the lesson is completed, students should be given the handouts: “My Fruit and Veggie Snack,” (p. 109) “Eat More Fruits and Veggies,” (p.110) and “My Fruit and Veggie Goals” (p.111) for the students to complete on their own as homework.

Assessing Knowledge
To determine knowledge gained, a 25 question test is provided in Appendix A. This test can be given to students both prior to and following the lessons. In addition, it is recommended that a third assessment period, several weeks later, should be conducted to determine knowledge retention.

The test requires students to identify the names of 10 different fruits and 10 different vegetables shown in pictures. Most of these fruits and veggies are ones that students may not necessarily see on a normal basis. About five of each should be common fruits and veggies that students have a higher chance of eating locally. Five questions should be matching foods to the vitamins or nutrients contained in a food. The test for this study can be found in Appendix A.

Delivering the Lessons
To include all three assessments during the same semester, these lessons should be delivered early in the semester. The three tests should not vary. Each test should be given in class and read aloud so that students may read along and answer the questions. The first lesson should then be taught with homework due at the beginning of the next class. The next time that the students meet, the second lesson should be taught, and similarly, homework should be due the next lesson. The second test should be completed the next time that the
students meet so that students are no relying on answers in short-term memory and have completed their second homework assignment. At least one month after, as all the tests should be given in the same semester, the test should be given a last time to see if students have retained their nutritional knowledge.

**Conclusion**

Obesity is an epidemic not just in adults, as obese children tend to remain obese into adulthood (Osborne & Forestell, 2012). Therefore, it is important that physical and health educators incorporate nutrition into their curricula (Agozzino et al., 2007). This article has provided a practical method for incorporating two lesson plans into a curriculum that provide practical nutritional knowledge. Further, an assessment has been included that can be used to determine pre and post knowledge acquired from the lessons.

**References**


