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## An Adolescent Nutrition Learning Model to Facilitate Behavior Change in Overweight Teens

### Abstract

Understanding the process by which adolescents learn about nutrition is necessary for developing tailored education that leads to sustainable behavior change. Teens aged 15–17 participating in an obesity prevention program were interviewed. From the data, three themes emerged and informed development of an adolescent nutrition learning model. The themes were (a) valuable nutrition information provided by a reputable source, (b) hands-on learning as a learning preference, and (c) the linking of concepts learned to behavior change. The adolescent nutrition learning model that resulted encapsulates obese adolescents' process for learning about nutrition to bring about behavior change and can be integrated into nutrition education programs and interventions.

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### Introduction

Between 1980 and 2010, the number of adolescents 12–19 years of age who were considered obese increased from 5% to 18% (Centers for Disease Control and Prevention, 2012). Obviously, concern over obesity among adolescents has grown as well. Moreover, the increase in adolescent obesity has a direct impact on the prevalence of adult obesity (Spruijt-Metz, 2011). Adolescents commonly lack the nutrition knowledge needed to make healthful choices and often require nutrition education that is tailored to their learning styles (Casazza & Ciccazzo, 2007). A variety of Extension programs target adolescents and have been developed to address their learning needs (Norquest, Phelps, Hermann, & Kennedy, 2015); however, with greater attention by Extension on offering nutrition education to prevent and treat childhood obesity, insight into overweight adolescents' perceptions relevant to learning about nutrition is valuable. The purpose of the study described in this article was to investigate adolescents' process for learning about nutrition during an adolescent obesity intervention program. An adolescent nutrition learning model was developed from thematic analysis of 10 one-on-one interviews with overweight teens following their participation in the obesity intervention program.

## Methods

As part of a study that followed an adolescent obesity intervention program (Ramsay, Wilson, Young, & Becker, 2013), 20 adolescents who completed the program were asked to participate in one-on-one in-depth interviews. Ten (50%) agreed to be interviewed. An adolescent nutrition learning model emerged from the analysis of their responses. Approval for the study was granted by the University of Idaho Institutional Review Board.

### One-on-One Interview Procedures

One-on-one interview procedures followed protocol guidelines of Miles and Huberman (1994). An interview questionnaire guide was developed and reviewed by a childhood obesity expert. Participants were asked questions about what they learned from the nutrition component of the adolescent obesity intervention program. The following questions are examples of those asked: What did you learn from participating in the program, and about nutrition? What nutrition information did you want more of during the program? What nutrition information did you learn during the program that you will continue to use? Probing questions were asked as needed to gather further details and explanations from the participants. Interviews lasted approximately 30 min and were audio-recorded and transcribed.

### Data Analysis

Following the guidelines of Miles and Huberman (1994), transcriptions were systematically coded and analyzed to identify central themes. Multiple reviews of transcript data, codes, and themes occurred at each step of the data analysis process to confirm codes, themes, and metathemes. Data analysis consisted of data reduction, data display, and conclusion drawing and verification. The purpose of data reduction was to condense transcript data and focus on terms addressed by participants. Following data reduction, terms were categorized, and labels were given for data display. The categorizations and labels were then grouped into themes. Once data were organized and themes were categorized, connections between themes and metathemes emerged and aided the process of forming conclusions. All procedures in the data analysis were reviewed by a child obesity expert in addition to the primary researcher.

## Results and Discussion

### Demographics

Ten adolescents participated in the one-on-one interviews. Adolescents provided demographic information and reported their perceptions related to learning about nutrition and changing their nutrition-related behaviors. Demographic information is presented in Table 1.

**Table 1.**  
Demographics of Study Participants

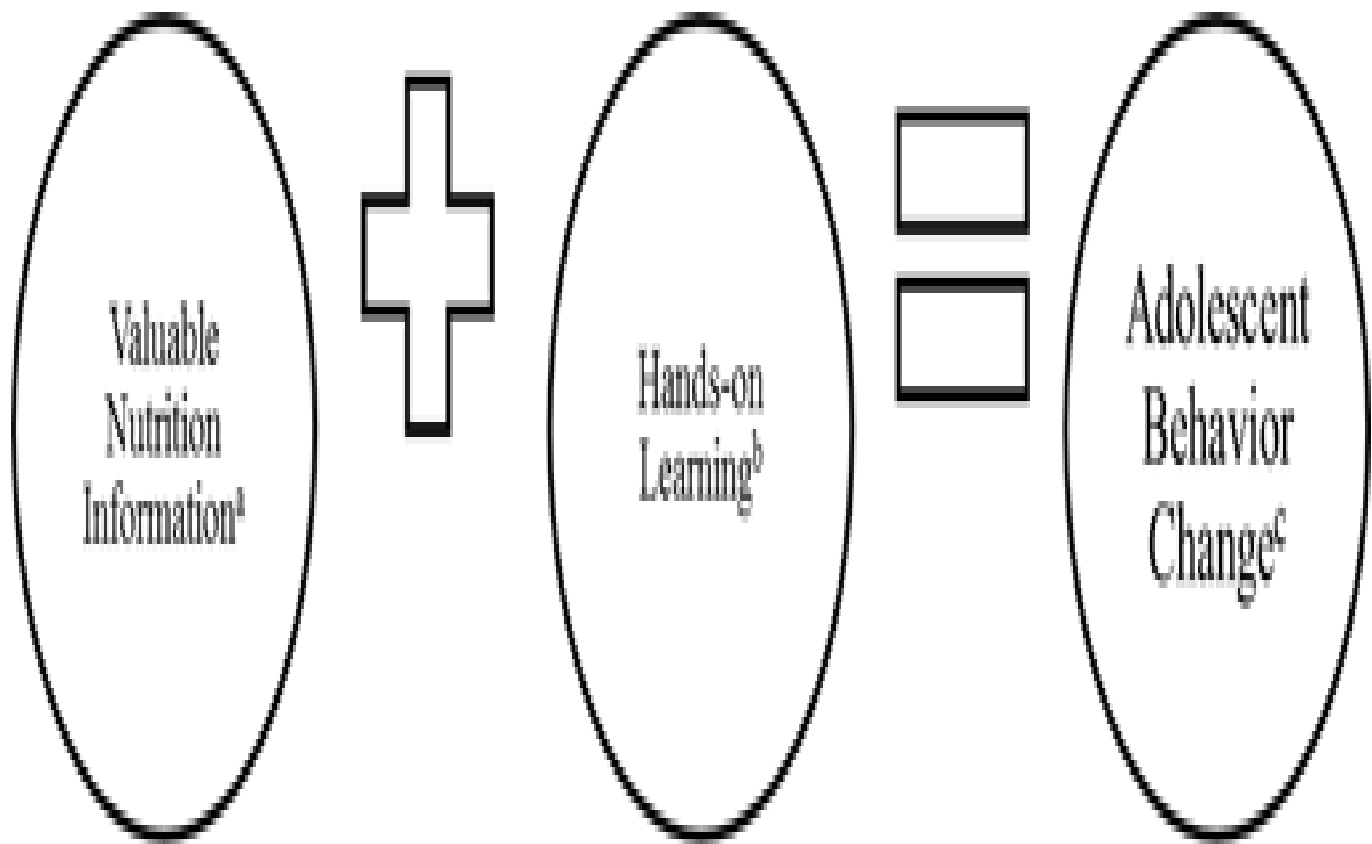
Characteristic of study participant	No.	%
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Gender		
Male	2	20
Female	8	80
Age		
15	1	10
16	5	50
17	4	40
Year in school		
10th	6	60
11th	4	40
Race		
American Indian/Alaskan Native	1	10
White	8	80
Other	1	10
Involvement in organized sports		
Yes	4	40
No	6	60
Marital status of parents		
Married	6	60
Divorced	3	30
Separated	1	10

## Adolescent Nutrition Learning Model

Three interconnected and overarching themes emerged and form the basis of the adolescent nutrition learning model (see Figure 1). Those themes were (a) valuable nutrition information provided by a reputable source, (b) hands-on learning as a learning preference among adolescents, and (c) the linking of concepts learned to adolescent behavior change.

**Figure 1.**  
Adolescent Nutrition Learning Model



<sup>a</sup>Subthemes include (a) receiving nutrition information that is based on adolescents' individual needs and (b) receiving nutrition information that is delivered in a supportive and nonjudgemental manner. <sup>b</sup>Subthemes include (a) learning in an experiential classroom, (b) learning from visual aids, (c) tasting/trying new foods, and (d) working in groups (engaging in a social learning environment with peers).

<sup>c</sup>Subthemes include (a) adding a variety of foods to one's diet; (b) making healthful choices while eating out with friends or when traveling; (c) incorporating nutrition principles learned (e.g., understanding portion sizes and recognizing internal cues); (d) reading nutrition labels; and (e) making a difference in family and friends by sharing nutrition information learned.

### ***Valuable Nutrition Information***

The valuable nutrition information component of the model refers to receiving nutrition information from a nutrition expert. In particular, the adolescents in the study desired nutrition information that is based on individual needs, a preference that has been identified previously (Flattum, Friend, Story, & Neumark-Sztainer, 2011). Additionally, the teens, who already felt judged because of their weight, favored nutrition information that is delivered in a supportive and nonjudgmental manner, another preference that has been noted previously (Jelalian, Sato, & Hart, 2011).

### ***Hands-On Learning***

The second theme represented in the model, hands-on learning, relates to activities the adolescents

identified as fun and enjoyable. These activities included (a) learning about nutrition in an experiential classroom, (b) learning from visual aids that guided nutrition information, (c) tasting/trying new foods, and (d) working in groups. Taking part in activities in an experiential classroom empowers adolescents to learn how to make healthful choices in real-life settings (Contento, Koch, Lee, & Calabrese-Barton, 2010). The adolescents enjoyed seeing visuals that helped explain the information being presented. These visuals included the U.S. Department of Agriculture's MyPlate graphic, which shows food groups and portion sizes, and Bodybugg®, an electronic wearable device that tracks calories burned and steps taken and displays graphs and charts. Tasting and trying new foods during nutrition classes increased the adolescents' willingness to eat, or at least try, different foods. Finally, the adolescents enjoyed working in groups, a preference that is supported by research suggesting that interaction with peers and friends reinforces a social learning environment (Wilson, 2007).

## ***Adolescent Behavior Change***

Overweight adolescents identified concepts learned during the nutrition component of the intervention and provided examples of how they applied those concepts (see Table 2). Most commonly reported behavior changes included (a) adding a variety of foods to their diet, (b) making healthful choices while eating out with friends or when traveling, (c) incorporating nutrition principles, (d) reading nutrition labels, and (e) effecting behavior changes in family and friends by sharing nutrition information learned. Teens in the study reported that combining knowledge gained from valuable nutrition information with hands-on learning is useful for enacting positive behavior changes. Gaining both knowledge and skills made it practical for the teens to apply the information they learned to their everyday lives and to easily make sustainable changes. These results reinforce previous research having similar findings (Norquest et al., 2015).

**Table 2.**

Adolescent Behavior Change Linked to Nutrition Concepts Learned

<b>Application of concepts learned (behavior change)</b>	<b>Outcome(s) and associated comment(s)</b>
Teens added a variety of foods to their diets.	<p>Added fruits, vegetables, grains, and lean proteins to meals and snacks</p> <p>"[What] I learned from the program was a whole different outlook on food . . . adding more variety of foods to my diet . . . I [now] know there's a variety of food out there that I can try."</p> <p>Able to distinguish between popular fad diets and evidence-based nutrition information</p> <p>"I used to eat just meat every night—that's it—for dinner."</p>

	<p>[Having a registered dietitian nutritionist in the program] helped me. I didn't know what I should be eating and how I should be eating it. I never [knew I] had to have fruits and vegetables. I thought, 'no carb diet.' I didn't know I was supposed to have variety."</p>
<p>Teens made more healthful choices when eating out with friends or when traveling.</p>	<p>Able to choose more healthful options from restaurant menus</p> <p>"Just make healthier choices, like when you go out to a steak house, instead of getting steak and a potato, you could get a steak and a salad."</p> <p>Able to choose more healthful options during a trip</p> <p>"We had to eat at airports [when traveling], but I knew the choices I could eat that I didn't know about before."</p> <p>Able to make more healthful choices while enjoying social outings with friends</p> <p>"I learned to make better choices and [to meet] other people half way [so that I would not be excluding] myself from everyone else. So if [my friends and I go] out to dinner, I can make my own decisions."</p>
<p>Teens applied nutrition principles learned through interaction with registered dietitian nutritionists.</p>	<p>Able to recognize and consume appropriate portion sizes</p> <p>"[I learned about] portion sizes and balanced diets and putting those fruits and vegetables in with your meals."</p> <p>Able to make small changes to lead to healthful outcomes (i.e., "all foods fit in in moderation")</p> <p>"You can change other ingredients to make [a recipe] healthier, and you don't have to [eliminate the recipe] . . . just [use] alternative stuff."</p> <p>Able to recognize and follow internal cues</p>

	<p>"You don't have to eat everything on your plate. When you're full, you can just be done with it."</p>
<p>Teens applied knowledge of how to read nutrition labels at the supermarket to make more healthful food choices.</p>	<p>Able to make healthful choices in types of fat used for cooking (i.e., saturated fat vs. unsaturated fat or oil vs. butter)</p> <p>"I liked the oils, different kinds of oils, and we looked at the nutrition [labels] on the back of [them]. Then my dad and me went to Albertson's right after [the fats and fiber class] . . . I told him about the oils, and he was like, 'Let's go look at the oils!'"</p> <p>Able to choose a more healthful food product instead of a similar but less healthful product</p> <p>"[Now] I know how to read a food label, and I know exactly what is in something before I eat it, so it has really helped me . . . to know [that] maybe I shouldn't eat [something]."</p>
<p>Teens used their nutrition knowledge to change the behaviors of those around them.</p>	<p>Able to share nutrition knowledge learned with friends and family to change their behaviors</p> <p>"It was very important to have the nutrition component. And it didn't just change you. It changed anyone else around you [referring to friends and family]."</p>

## Implications for Practice

Interventions tailored for overweight adolescents are necessary to meet the needs of this population (Rhea & Bettles, 2012). Nutrition education strategies, such as using experiential classrooms and incorporating hands-on activities, provide overweight adolescents with the knowledge and skills they need to make positive behavior changes (Condrasky & Hegler, 2010). Extension and health professionals may consider using the adolescent nutrition learning model for future adolescent obesity interventions and nutrition education to promote sustainable, healthful behavior changes.

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