# The Impact of the Teen Cuisine Curriculum on the Health Belief Model and Dietary Behaviors

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## Abstract

*African American adolescents have the highest rate of obesity. The purpose of this study was to determine the impact of the Teen Cuisine Curriculum on selected health-belief constructs and dietary behaviors on predominately African American adolescents. Twenty-five African American adolescents formed the purposive sample that completed the Healthy Eating Beliefs Survey and the Behavior Checklist. The Statistical Package for the Social Sciences (SPSS) 21.0 was used to conduct the t-test for dependent means to compare the pretest and posttest scores of participants. The findings from this study were not statistically significant. For perceived susceptibility, participants did not believe they were likely to become overweight in the future. For dietary behaviors, participants' vegetable and whole-grain intake increased after the program. There was a disconnect between disease risk and lifestyle factors among adolescents. More research is needed to increase awareness of childhood obesity and its consequences among children and adolescents.*

**Keywords:** Nutrition Education; Adolescents; Health Belief Model; Dietary Behaviors; Community; Teen Cuisine; Curriculum.

## *Introduction*

The rate of childhood obesity has tripled over the last 3 decades (Ogden et al., 2006), and the current prevalence rate of obesity among children and adolescents is approximately 17% (Ogden, Carroll, Curtin, Lamb, & Flegal, 2010). Ethnic minorities, particularly African Americans and Hispanic Americans, have been disproportionately affected by childhood obesity. Several psychosocial and physiological conditions have been linked to childhood obesity (Must & Strauss, 1999).

Several theoretical frameworks have been widely used in health promotion interventions. The Health Belief Model (HBM) has produced positive outcomes. The premise for the HBM is that people are more likely to be proactive for their health if they believe they can avoid a negative health condition. Prevalent use of the model resulted in programs and interventions that successfully changed beliefs of individuals in efforts to increase healthy behaviors (Hazavehei, Taghdisi, & Saidi, 2007). Several studies identified success with health behavior programs targeting adolescents and young adults (Sanders, Nsuami, Cropley, & Taylor, 2007; Winham & Jones, 2011). In addition to overall behavior change, the HBM has had positive results in nutrition-education interventions (Burrows, Warren, Baur, and Collins, 2008).

Most interventions targeting childhood obesity have occurred in the school setting, and tend to lack community and parent involvement (Burnet et al., 2007). If effective strategies to reduce obesity rates are not implemented, obese children and adolescents are likely to experience negative physical and psychological consequences. Researchers have suggested that community-based interventions may be effective in producing positive behavior change (O'Connor et al., 2008); however, there is limited research on this topic for minority youth and related to constructs using the health-belief model. Although some of these interventions have resulted in reductions in BMI and waist circumference, a culturally tailored, church-based program may be more effective in reducing obesity in minority adolescents (Gittelsohn & Kumar, 2007). Furthermore, there is minimal literature on the impact of interventions in community settings such as faith communities, and even less research on the impact of nutrition-education interventions in adolescents.

The purpose of this quantitative, no experimental, one-group pretest–posttest design was to determine the impact of the Teen Cuisine Curriculum in a community-based setting on selected health-belief constructs and dietary behaviors in predominately African American adolescents. Results received from this study will assist researchers to prevent childhood obesity in community settings.

## *2. Methods*

### 2.1Research Design

A pretest–posttest study design was used to determine the impact of the Teen Cuisine Curriculum on a community-based setting using selected health-belief constructs and dietary behaviors in a predominately African American adolescent population. The group was given an instrument before and after the intervention. This design involved one test group and lacked a comparison group. Subjects were given a pretest and then a posttest, and data measured if a change in outcome had occurred (Babbie, 2007).

### 2.2 Pilot-Test Procedures

The instruments for this study were pilot tested in an effort to determine reliability. Participants for the pilot study were from Virginia Cooperative Extension programs. Adolescents for the pilot study were similar in demographics to the target population for the research study. Participants received consent forms prior to the test and the instrument was then administered in person. A response was analyzed and internal consistency and reliability was determined by measuring Cronbach's alpha. The pilot study occurred between May and June 2013; 13 participants took part in the pilot study. Parental consent and assent forms were distributed to these participants over a 2-week period and ten signed forms was obtained from 10 (77%) of these participants. After obtaining consent, participants completed the survey and all surveys were used to test for the reliability of the instrument.

### 2.3 Population and Sample Size

Participants were recruited for the research study from The Teen Cuisine Program that was implemented in a predominately African American Baptist Church in Southside Virginia that was affiliated with the Baptist General Convention of Virginia. The at-risk youth population included ethnic minorities and youth who were currently overweight or obese. The sample size consisted of predominantly African American adolescents. Participants and their parents were invited to participate in the study through a recruitment letter and information session.

The sample size consisted of approximately25 African American adolescents. Participants ranged from the ages of 11 to 18. Demographic data was collected as part of the pretest and posttest. Of participants, 76% were girls, 36% were middle school children between the ages of 11 and 13, whereas 64% of participants were high school children between the ages of 14 and 18.The appropriate sample size for this study was determined by conducting a power analysis, using G*Power 3 software (Faul, Erdfelder, Lang, & Buchner, 2007). An a priori power analysis, assuming an effect size ($f$ = .25), a = .05, indicated a minimum sample size of 34 total participants to achieve a power of .80.

**2.4 Instrumentation**

The study measured selected HBM constructs by modifying Champion's (1999) Health Belief Model Scale. Champion used the scale to measure selected constructs of the HBM on mammography and breast-cancer screening. Permission was obtained from Champion to modify the scale to measure the impact of the Teen Cuisine Curriculum, a nutrition education program, on selected constructs of the HBM (perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and self-efficacy) and childhood-obesity prevention. Although, this scale has been used primarily by adults and in cancer-prevention studies, the items used for each construct were changed to answer the research question in this study. The new scale was modified to develop the Healthy Eating Beliefs Survey (HBS).

Dependent variables were defined and four scales were modified: (a) a scale measuring susceptibility and severity of childhood obesity, (b) a scale measuring perceived benefits of participating in positive dietary behaviors, (c) a scale measuring perceived barriers about participating in positive dietary behaviors, and (d) a scale measuring confidence (self-efficacy) about participating in positive dietary behaviors. The constructs measured were perceived susceptibility and perceived severity (10 items), perceived benefits and perceived barriers (four items), and confidence (self-efficacy; five items). The scoring for the scale consisted of *Strongly Disagree* (1), *Disagree* (2), *Neutral* (3), *Agree* (4), and *Strongly Agree* (5).

Dietary behaviors were measured through the Expanded Food and Nutrition Education Program Behavior Change Checklists for sixth- through eighth-grade students and ninth- through twelfth-grade students. This was the evaluation tool used for the Teen Cuisine Program. The behavior checklist was a 14-item survey used to measure dietary behaviors, physical activity, food safety, and food security (Expanded Food and Nutrition Education Program, 2012). Question responses were entered and coded into Microsoft Excel, then SPSS 21.0.

**2.5 Instrument Validity and Reliability**

A four-member expert panel measured the construct validity of the HBM scales by assessing readability, face validity, and content validity in a one-round review process. All panel members had expertise in behavior-change theories, pediatric obesity, and instrument development. The panel described readability as the meaning of each item to be clear and understandable and the language used to be appropriate for a sixth-grade reading level. The panel described face validity as the appearance of each item to measure the intended construct defined in this study. The panel defined content validity as the adequacy of each item to assess each construct of the HBM.

**2.6 Intervention**

The Teen Cuisine Program is a skill-based food-preparation health curriculum for adolescents that consisted of six nutrition education sessions, one per week for 6 weeks. Each intervention session was approximately 1 hour and 30 minutes and included a lecture and a hands-on activity. Trained volunteers administered the nutrition sessions. Topics included general nutrition, protein, fat, meal planning, and food preparation. The Virginia Cooperative Extension developed the curriculum materials.

**2.7 Data Collection and Analyses**

The program was implemented in Fall 2013. Prior to data collection, approval was received from Walden University's Institutional Review Board (approval number 05-07-13-0153965) with an April 15, 2014 expiration date, and all participants and parents consented to participate in the research component. All participants were administered the survey before and after the intervention. Participants were assigned a code that was used on all surveys and kept all participants' identifiers confidential. Data was analyzed using the statistical software SPSS 21.0. Descriptive statistics were calculated for all dependent variables and for demographic information. Inferential statistical analyses consisted of the *t*-test for dependent means of before and after measures. Internal-consistency reliability was reviewed using Cronbach's alpha to determine the internal consistency of the researcher-developed instrument. Significance levels for all inferential analyses was set at < .05.

## *3. Results*

### 3.1 Pilots-Study Phase

The reliability scores for each construct measured in the HBS was compared to the reliability score of items measured in Champion's (1999) Health Belief Model Scale. For most constructs, the reliability scores between the two instruments were similar. According to Nunnally (1978), an acceptable reliability score is 0.70. Of the five scales tested, three (60%) had a reliability score of 0.70 or greater: susceptibility, severity, and barriers. The self-efficacy scale score of 0.68 was closer to the acceptable reliability score; therefore, the items in the scale were used in the HBS. Due to the low reliability score of the benefits' scale, the four items in this scale were eliminated from the HBS, thus removing the perceived benefits' construct from the study's research question.

### 3.2 Data Collection

#### *3.2.1 Recruitment*

Thirty-four participants in the Teen Cuisine Program were recruited to participate in the research study using purposive sampling between July and August 2013. Parental consent, informed consent, and assent were obtained for 29 (85%) of the participants over a 2-week period. Of participants who returned the informed consent and assent forms, 25 (86%) completed the survey before and after the program. The data collection period for the research study was approximately 6 weeks and occurred between September and October 2013.

#### *3.2.2 Sample Demographics*

The participants of the research study resided in the geographical region of Southside Virginia. All adolescents enrolled in the research study were African American. This sample was representative of the target population, specifically in Virginia, because African Americans have the highest rate of obesity in the state. Of participants, 76% were girls, 36% were middle school children between the ages of 11 and 13, whereas 64 % of participants were high school children between the ages of 14 and 18.

### 3.3 Research Study Results

#### *3.3.1 Health Belief Model Constructs*

The construct self-efficacy averaged the highest scores of 4.17 (preprogram) and 4.11 (post-program) on a 5-point Likert scale. The items that averaged the lowest scores were perceived susceptibility (post-program) and perceived barriers (pre- and post-program). Perceived susceptibility had a score of 1.78 on a 5-point Likert-type scale. Perceived barriers had the lowest score of 1.77 (preprogram) and 1.92 (post-program) on a 5-point Likert-type scale. There were no statistically significant differences observed between the effectiveness of the Teen Cuisine Curriculum and the constructs of the HBM. Participants selected *disagree* for the perceived-susceptibility construct preprogram ($2.01 \pm 0.92$). Post-program participants selected *strongly disagree* for the perceived-susceptibility construct ($1.78 \pm 0.77$). For perceived severity, participants selected *disagree* preprogram ($2.85 \pm 0.91$) and *disagree* post program ($2.68 \pm 0.97$). For perceived barriers, participants selected *strongly disagree* preprogram ($1.77 \pm 0.51$) and *strongly disagree* post program ($1.92 \pm 0.55$). Participants selected *agree* for the self-efficacy construct preprogram ($4.17 \pm 0.66$) and *agree* post program ($4.11 \pm 0.59$). A *t*-test for dependent means was conducted to compare the scores of each of the constructs of the health belief model pre measure and post measure (see Table 1). The *t*-test failed to reveal a statistically significant difference between each of the mean pre measure scores and post measure scores.

#### *3.3.2 Dietary Behaviors*

The dependent variable, dietary behaviors, specifically vegetable intake, fruit intake, low-fat-milk intake, sweetened-drinks intake, whole-grain intake, and restaurant intake for the research study, was measured on the Behavior Checklist. For several of the dietary behaviors, the mean score increased. Based on the previous day's intake, participants selected that they did not consume vegetables before the program ($1.76 \pm 1.05$) and after the program, participants selected that they consume vegetables one time during the day ($2.20 \pm 1.00$). For whole-grain intake, participants selected that they consumed whole grain once in a while preprogram ($2.56 \pm 1.29$) and post program participants selected that they consumed whole grains sometimes ($3.00 \pm 0.91$). A *t*-test for dependent means was conducted to compare the dietary-behaviors pre measure score to the dietary-behaviors post measure score (see Table 2). The *t*-test failed to reveal a statistically significant difference between the mean pre measure dietary-behaviors score and post measure dietary-behaviors score.

## *4. Discussion*

Childhood obesity continues to rise in the United States; particularly, ethnic minorities have among the highest rates (Ogden et al., 2006; Ogden et al., 2010). There are a variety of factors that contribute to this epidemic, such as dietary behaviors, health beliefs, knowledge, and environmental influences. The purpose of this study was to determine the impact of the Teen Cuisine Curriculum in a community-based setting on selected health-belief constructs and dietary behaviors in predominately African American adolescents in Southside Virginia. Adolescents often model parental dietary behaviors and this can contribute to healthy or unhealthy lifestyles. Due to parental community involvement, community-based nutrition-education programs are ideal for childhood obesity prevention.

In this study, a statistically significant difference was not observed between the effectiveness of the Teen Cuisine Curriculum and the constructs of the HBM. Teen Cuisine participants believed they were able to participate in positive dietary behaviors such as eating and preparing healthy foods; this will help them reduce their risk of becoming overweight. I measured outcomes by their selection of *agree* for self-efficacy pre- and post-program. Other researchers observed a relationship between increased self-efficacy and decreased disease risk (Winham & Jones, 2011; Steele et al., 2011). For perceived susceptibility, participants selected *disagree* preprogram and *strongly disagree* post-program. Participants reported post program that they did not believe they were at risk for becoming overweight in the future. Also, participants reported they did not believe the consequences of overweight were severe. Although the results in this study were not statistically significant, other researchers found similar results in that participants did not believe that they were at risk for contracting a health condition because they perceived they were healthy (Sanders et al., 2007). Based on the results of the HBS in this study, participants reported they did not believe there were barriers to eating healthy; they selected *strongly disagree* pre- and post-program. Park (2011) found similar results in that there were no significant differences for perceived barriers related to dietary behaviors.

The results for this research question are consistent with the literature in that research findings of other studies found no statistical significance as well (Park, 2011; Sanders et al., 2007). Several factors could have contributed to the lack of statistically significant results: the study's sample size, the length of the intervention, the lack of awareness and knowledge of the consequences of childhood obesity among participants, participants' lack of understanding of survey questions, and the use of the Likert-type scale in the instrument.

In this study, a statistically significant difference was not observed between the effectiveness of the Teen Cuisine Curriculum and dietary behaviors. Increases were observed in vegetable consumption post program. For vegetable intake, participants reported they consumed vegetables (cooked, canned, or in salads) one time during the day preprogram and two times during the day post program. Burrows et al. (2008) found increases in vegetable intake post program as well. Also, Burrows et al. found that taste, benefits of healthy eating, fast-food intake, and availability of fruits and vegetables at home influenced fruit and vegetable intake among adolescents. In the HBS, participants were asked several questions regarding perceived barriers to fruit and vegetable consumption. After the Teen Cuisine program, 92% of participants did not feel awkward about eating fruits and vegetables, 80% of participants did not feel that eating fruits and vegetables embarrassed them, and 80% of participants did not feel that eating fruits and vegetables would be unpleasant.

The findings from this research study are consistent with the findings of other nutrition-education interventions targeting adolescents in that increases in fruit and vegetable intake was higher post program than any other food group and no statistically significant differences were observed in either study (Burrows et al., 2008). For whole-grain consumption, participants reported they consumed whole-grain products (brown rice, whole-grain bread, and whole-grain cereals) once in a while before the Teen Cuisine program and sometimes after the Teen Cuisine program. O'Connor et al. (2008) found that adolescents were able to make healthier food choices post intervention. Nutrition education that focuses on behavior change is an effective component of childhood obesity interventions (Hoelscher et al., 2002). Sweetened-beverage consumption has contributed to adolescent obesity (Vanselow et al., 2009), associated with lower intake of healthy foods such as milk. On the Behavior Checklist, participants were observed to have consumed sweetened drinks (soda, fruit-flavored drinks, sports drinks, energy drinks, and vitamin water) one time during the day. These results were consistent with the 2011 YRBS results, which reported that 28% of adolescents consumed soda at least one time during the day (CDC, 2012b). No low-fat milk (nonfat, 1% milk, low-fat chocolate or flavored milk, and low-fat milk on cereal) consumption was observed in this study.

*4.1 Limitations*

The study's sample was limited to adolescents between the ages of 11 and 18 enrolled in the Teen Cuisine Program. The age range of the target population was defined at the beginning of the study and the Virginia Cooperative Extension defined the appropriate age for participants in the Teen Cuisine Program. Anthropometric data was not measured. It was believed that collecting weight data would deter participants from participating in the study by focusing on weight-related numbers or terms such as obesity and overweight. The sample size of the research study was contingent on the researcher's ability to recruit participants from the Teen Cuisine Program to participate in the study for 6 weeks. Also, participants were allowed to participate in the program without being part of the research study. Participants and parents did not want to participate in such a lengthy research study. The research study was independent of the program that was sponsored by another entity. Due to these limitations, it was difficult to recruit the minimum sample size needed. The study results may not be generalizable outside of the southern Virginia metropolitan area. The research study was conducted in an urban city in Southside Virginia. The city had a population of about 30,000 residents; 80% of city residents are African American. The involvement of participants was dependent on their guardian. The research study was independent of the intervention. Therefore, the researcher was not able to oversee program procedures to ensure that each lesson and activity was carried out as instructed by the program's manual.

## *5. Conclusion*

This study observed a disconnect between disease risk and lifestyle factors among adolescents. More research and health-promotion initiatives should be designed to increase awareness of childhood obesity and its consequences among children and adolescents. More multi component interventions are needed to produce more positive outcomes in childhood-obesity prevention. Interventions should have a nutrition-education and a physical-activity component. In addition, interventions should measure dietary behaviors and anthropometrics, providing valuable information that can assist researchers and health professionals with information needed to impact childhood-obesity prevention efforts. Both schools and community-based settings are essential for behavior-change-focused interventions. Schools provide an organized and established structure that can foster knowledge and behavior change. In addition, interventions occurring in the school environment can increase recruitment, participant retention, and participation. Community settings provide parental involvement, needed for positive parental dietary-behavior modeling. Children and adolescents often pattern dietary and physical activity behaviors of their parents.

**Table 1:** ***Health Belief Model Constructs t-test***

| | Mean differences | *t*-test | Sig. (2-tailed) |
|---|---|---|---|
| Perceived Susceptibility (pre and post) | 0.228 | 1.309 | .203 |
| Perceived Severity (pre and post) | 0.168 | 0.819 | .421 |
| Perceived Barriers (pre and post) | -.152 | -1.162 | .257 |
| Self-Efficacy (pre and post) | 0.056 | 0.414 | .683 |

**Table 2:** ***Dietary Behaviors t-test***

| | Mean differences | *t*-test | Sig. (2-tailed) |
|---|---|---|---|
| Vegetable Intake (pre and post) | -.440 | -1.464 | .156 |
| Fruit Intake (pre and post) | 0.000 | 0.000 | 1.000 |
| Low-fat Milk Intake (pre and post) | -.280 | -1.193 | .244 |
| Sweetened-Drink Intake (pre and post) | -.040 | -.120 | .906 |
| Whole-Grain Intake (pre and post) | -.440 | -1.367 | .184 |
| Eating Healthy at Restaurant (pre and post) | -.200 | -.655 | .519 |

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