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Cooking Camps: A Novel Approach to Increase Knowledge and Cooking Skills among American Indian Youth

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Abstract

A pilot series of kids cooking camps was implemented on an American Indian reservation over the course of two years using Social Cognitive Theory to test short-term knowledge and behavior changes. Cooking camps were held over the course of two summers at four locations for six hours per day, four days per week. Camps incorporated information about My Plate, gardening, farm-to-fork, label reading, and physical activity. Cooking camps showed promising results in short-term knowledge gains and behavior changes.

Keywords: American Indian; Food security; Food insecurity; Nutrition; Camp; Self-efficacy; Social cognitive theory

Introduction

American Indian youth face high levels of poverty, disease, and obesity. Nutrition and physical activity are recognized as methods to combat obesity and other health factors affected by diet quality. The Academy of Nutrition and Dietetics (AND) recently published a study indicating that improved access to food and higher nutrition standards could foster healthy eating and “help raise a healthier generation of American Indian and Alaskan Native youth” [1]. Fleischhacker also lists engagement and empowerment of American Indian and Alaskan Native youth as a means of addressing the nutrition-related health problems in the American Indian population, however she neglects to include engagement at the local, community level for youth, who may have low access to transportation. In the United States and the United Kingdom, as in other areas, higher poverty is associated with lower diet quality [2-4]. Food poverty and health briefing statement [Introduction], n.d.). Low diet quality could be impacted by a variety of factors including: low access to fruits, vegetables, and whole grains, low self-efficacy, skills, or knowledge of cooking, lack of time to prepare nutritious meals with available ingredients, and low access to transportation, among others.

Both school-based and summer camp interventions see improved outcomes with parental involvement, possibly because parents are more able to reinforce the concepts at home after seeing them used in the classroom and camp settings [5-7]. However, it is not always possible to involve parents in a curriculum due to work and other time commitments.

Cooking camps for low-income youth provide opportunities for youth to learn basic culinary skills that are needed to prepare food for themselves and family members in a safe, controlled environment. These camps also foster an atmosphere where trying new foods is encouraged and praised, increasing the efficacy of the programs through participant engagement as well as involvement.

The authors are unaware of any previous studies examining nutrition education among American Indian youth and the knowledge and behaviors changes associated. Therefore, a series of cooking camps was created to encourage American Indian youth to practice their cooking skills while teaching them about My Plate and other important life skills such as food safety and gardening in a culturally acceptable way. The camps used Social Cognitive Theory (SCT) to inform the process of behavior change. The overall goal of this pilot series of camps was to create and evaluate a curriculum that incorporated food preparation techniques, nutrition information, and physical activities in a culturally acceptable, fun-filled day camp for Native American youth, and to test the short-term knowledge gains that the camps generated.

Methods

Theory

The program was informed by Social Cognitive Theory (SCT). This theoretical framework addresses health issues in communities by addressing individual and community self-efficacy in thoughts, behavior, and environment [8,9]. SCT is used in nutrition education research to make behavior change more attainable and sustainable for participants by creating hands-on learning opportunities [10-12]. The framework is

often used in school health interventions because of its use of peer to peer skill building and support.

The cooking camps aimed to provide participants with cooking skills, nutrition knowledge, and gardening experiences to build self-efficacy. We believe that youth practicing their new skills and knowledge at home will lead to familial knowledge transfer and the building up of community self-efficacy. The learning opportunities provided in the camp experience provide a safe atmosphere to learn and grow with positive role models and encouragement.

Camp setting and format

A pilot series of four cooking camps were held over the course of a summer on a rural and remote North Dakota reservation. Evaluations from the series and interviews with caregivers informed the process of standardizing a curriculum for the next year's series, which helped to finalize details in the curriculum and re-evaluate key points for educators who may be on a tight schedule.

The camps were held four days per week for six hours per day. Camps were held both in the morning and evening, based on community and facility availability. A total of 71 students participated in one of eight camps during the two year period.

Students prepared two snacks and one meal each day, with their last camp meal being a formal dinner prepared by the students with minimal help from the educators. Camp meals were planned around the My Plate icon and incorporated foods from all five food groups. The two snacks were also planned around My Plate as well as the camp topics. A sample camp schedule and menu are included after the references in Figure 1.

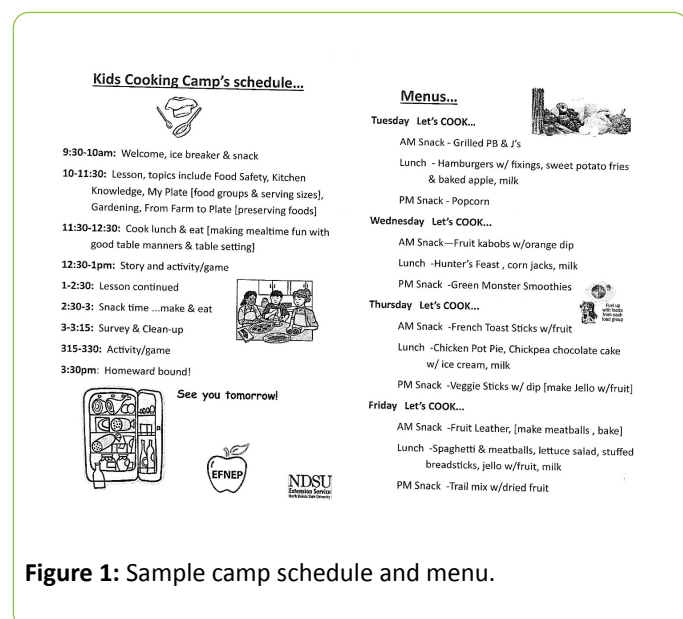


Figure 1: Sample camp schedule and menu.

Lessons were taught between times of games and food, with about 30 to 45 minutes being given to each subject, based on participant attention and interest. Alternate activities that promoted the lesson objectives were provided to participants when interest waned.

Participants

Participants were recruited through fliers posted around the reservations. We required that participants have finished second grade, but allowed participants up through eighth grade. Participants came from the community surrounding each camp site, arriving on foot or by bicycle, and the occasional student rode in with a parent or guardian. One site provided a bus and driver to pick students up.

Parents called to pre-register their children after seeing the signs posted near each site. The primary educator at these camps had a previous relationship with each of the site coordinators, who did some recruiting for us. Any student meeting the age requirement wishing to come to camp was allowed.

Educators

One Extension Service educator and a graduate assistant from the affiliated college served as nutrition educators for the camps. The Extension educator had worked on this reservation for a number of years and had a relationship with the site coordinators, with many of the participants, and with their families. The graduate assistant began the camps without a previously-existing relationship, but developed them over year one and into year two of the study.

Camp curriculum

Camp lessons included information about kitchen utensils, food safety, basic cooking techniques, gardening, food preservation, the farm-to-plate process, My Plate, and making healthy choices on a budget or in a hurry. Lessons incorporated times of lecture, skills practice, worksheets, crafts, physical activity games, and "acting it out" scenarios to provide students with multiple avenues of learning for with each of the learning styles. Each day's lesson built on previous lessons to allow participants to practice their cooking skills and knowledge.

Curriculum materials were compiled from various USDA curricula, non-profit organizations teaching the MyPlate message, and the Academy of Nutrition and Dietetics website for health educators. Food safety lesson materials were accessed from the Partnership for Food Safety Education website, fightbac.org. Farm to plate materials were used from the North Dakota State University Extension Service's Ag Mag and the Eat Smart Play Hard Magazine. Permission was granted to use materials coming from sources outside of the camp organizers.

The lesson plans addressed each of the questions in the pre-survey, and built on participant's current skills and education, incorporating reading, basic adding and subtracting, handling money in a play scenario, and interacting with other participants and educators. Questions from the assessment were incorporated into the lesson plans to encourage students to make healthful choices, such as eating more fruits and vegetables, choosing whole grains, drinking water, and being physically active.

Lessons were occasionally abbreviated and other activities substituted to make the material more age-appropriate and tailored to our audience's interests. Each of the substituted activities continued to teach the targeted messages, albeit in a different form. Some substituted activities included nature walks and garden visits to local, community-member's gardens, as well as to an occasional community office to meet with local volunteers and workers.

Participants kept their worksheets in a decorated folder and given the completed folder and a small goodie bag at the end of the camp to thank them for their participation. The goodie bag included small materials to promote the lesson objectives, such as a fruit and vegetable scrubber, hand soap, sun visors, a Frisbee, a food or refrigerator thermometer, and a MyPlate placemat. Small incentives were also taken home from the lesson throughout the camp, such as a small food plant or a seed to start at home, apple/fruit leather made at camp, a "Bac catcher" game, and a MyPlate bracelet based on the MyPlate plan for a specific child's age, gender, and activity level.

Evaluation

Participants took an assessment survey at the beginning of camp on day 1 to indicate their knowledge, skills, and behaviors, and again at the end of camp each day for the material covered that day. On the last day of camp after the remainder of the curriculum was presented, the post-assessment was given to measure short-term knowledge and behavior changes.

The data from each survey was entered into SPSS and descriptive statistics were determined [13]. We then sent the data to the NDSU Statistical Consulting Service for further inferential analysis with SAS [14]. One-tailed t-tests were used to check for knowledge gains. Because of the small sample size, Fisher's Exact test was used to check for changes in response distributions from baseline. The alpha level for all testing was set at $\alpha \leq 0.05$.

After the completion of the camps, participants and their families were invited to take place in a focus group on the reservation. However, because of scheduling conflicts, one in-person interview, and four phone interviews were conducted to evaluate participants' thoughts, feelings, and attitudes about the camp, and their parent or guardian's perceptions of the camp and its effectiveness.

Ethical considerations

The camp framework and survey questions were sent to North Dakota State University's Institutional Review Board, and the protocol was approved for use with our audience, provided a parent permission slip and media release form were signed. Sitting Bull Tribal College also reviewed the camp materials and approved them for use. The informed consent documents included information about the premise of the cooking camps, what activities would be involved, and that surveys would be given to evaluate what participants learned.

Before beginning camp, participants were required to turn in their signed permission slip, which included an informed consent document along with emergency contact information and a list of any known food allergies, as well as a media release form so that we could incorporate participant pictures in crafts, news releases, and to promote future camps. Camp participants were read an abbreviated, simplified informed consent and given the opportunity to withdraw from camp.

Results

Camp composition

During the course of two summers, a total of 71 Native American youth participated in the camps. Of the 71 participants, 35 completed all survey questions. The results discussed herein contain information from both years' data collection.

Children's physical activity and nutrition knowledge improved significantly over baseline, especially in the topic areas of quick meals, MyPlate, and making healthful choices when eating out ($p=0.002$, $p=0.006$, and $p=0.042$ respectively). From pre- to post-assessment, participants reported being more physically active ($p=0.0318$) and practicing safe food handling ($p=0.0092$). Participants also showed increased knowledge in the areas of gardening and food preservation from pre- to post-survey ($p=0.0063$ and $p<0.0001$ respectively), two areas that show promise in improving food security.

Responses to questions about three food groups showed improvement in knowledge. The improvements were those being the portion of a plate recommended for: fruits ($p=0.0446$), grains ($p=0.0183$), and protein ($p=0.0183$). One item of interest was a percentage of students showing decreased knowledge for the number of servings of dairy recommended for all people ages 9 years of age and older, though the trend was not significant ($p=0.6097$). Practicing culinary skills led the youth in the 2014 kids cooking camps to become somewhat more confident in using measuring cups and spoons ($t=1.29$, $n=30$, $p\text{-value}=0.20$) and to realize their need for additional practice and instruction at following a recipe ($t=-0.28$, $n=30$, $p\text{-value}=0.78$). However, these questions did not show significant improvement in the 2015 camps.

Parents who were interviewed about their child(ren)'s experience at cooking camp stated that they don't have enough time or are facing other barriers to practicing skills from camp. Time and supervision were two barriers that were listed as a concern for cooking more at home. Yet the favorite activity given from the camp was cooking, making the food, or otherwise tied to food preparation (Burdett, 2015, p. 31). Even given the concerns, parents and participants reported enjoyment of the camp atmosphere and activities.

Discussion

Participants showed knowledge gains in the areas of preparing meals quickly, MyPlate, healthful choices when

eating out, gardening, and food preservation. Participants also reported being more physically active and practicing safe food handling more often. Participants did not show significant increases in knowledge of label reading or traditional food systems/farm to plate. Along with Walters and Stacy our study found that cooking camps improve nutritional knowledge in at least some topic areas for American Indian youth.

While short-term knowledge tests showed improvements in some areas, several areas did not show a significant improvement over baseline. Increased exposure to the materials from camp may lead to more significant knowledge improvements, particularly through more targeted experiential learning, as Beets et al. [5] indicates.

A long-term follow up study has not yet been done to evaluate the long-term impact and outcomes of the camp. Future studies should follow participants over a longer period of time to evaluate health and behavior outcomes that may be affected by the knowledge gains in the camps, as well as community changes that could result from repeated camp experiences over the long-term.

Timing and relationships are important. Having long-term connections in a community may improve the relationships of counselors with campers and the general flow of camp, and possibly prevent some discipline issues that arise from “testing the waters” with new educators. Having community or parent volunteers may also allow a greater freedom to educators to experiment with more complicated recipes, crafts, and outings by providing more supervision for young and inexperienced participants [5-7].

Methods and curricula are difficult to standardize because of the variety of personality types, resources, and tribal cultural differences. However, a basic curriculum has been developed for use with American Indian youth that can be adapted to handle numerous camp atmospheres. This curriculum will be available to nutrition educators. Nutritionists and other educators should use a variety of methods to encourage youth to expand on what they already know, and ground new lessons in the previously-laid foundation.

Other limitations included: a lack of reliable transportation for the camp, a small sample size, and an inability to match surveys for a paired t-test analysis. A paired t-test analysis would have provided stronger power for our results and showed individual knowledge gains rather than group knowledge gains which could be coincidental. Being able to provide transportation could have given us more reliable numbers of students each day and improved our sample size.

Future studies should find a way of blinding surveys in a way that children can understand to allow for matched surveys. Providing transportation for children will allow a larger number of children to come to camp on a daily basis, giving them more exposure to the materials, and a more stable sample size.

Conclusion

A camp curriculum was developed and pilot-tested in a remote North Dakota reservation. Camp participants showed short-term knowledge gains in areas of nutrition and physical activity, as well as gardening, food preservation, and food safety. Long-term impacts were not evaluated. However, participants and family members who were interviewed reported high levels of enjoyment and improved food and nutrition practices at home in some areas.

Barriers such as age differences, discipline concerns, and developmental delays were presented to researchers as issues to be considered for future camps. Additional concerns such as providing time or supervision for further practice at home were also presented. These concerns will require examination and testing to alleviate.

Future camps should address targeted messages to a specific audience and reinforce those messages with age-appropriate materials. Learning styles differ and camps should avoid a “one-size fits all” approach, and instead tailor camps to meet participant and community needs. Increasing staff or recruiting volunteers may lead to a better adult to child ratio and allow for more freedom in the camp atmosphere.

Cooking camps continue to show promise for improving life skills among youth. As a result of the pilot study, the curriculum has been revised and finalized and is being used with additional audiences. The incorporation of nutrition and physical activity messages in camps may help combat the problem of obesity among some audiences, but long-term studies are needed to confirm this. Cooking camps foster a safe and creative learning environment for children where they can practice and learn new skills and try new foods. Short-term knowledge gains and skills practice show promise for behavior change, which could lead to a healthier generation.

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