

Eagle Adventure: School-Based Type 2 Diabetes Prevention Program Results in Improved Outcomes Related to Food and Physical Activity

Abstract

The Eagle Adventure program was designed as a semester-long, SNAP-Ed program to address food and physical activity choices important for prevention of type 2 diabetes, obesity, and other chronic diseases. The program was developed for implementation in Grades 1-3. This article presents findings from two participating grade centers inclusive of Grades 1-2. The elementary school-based program not only addresses health-related behaviors in a culturally relevant and responsive way, but also serves as a potential model for promoting diversity inclusion in Extension programming.

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Introduction

Supplemental Nutrition Assistance Programs Education (SNAP-Ed) is commonly implemented by Extension professionals and paraprofessionals in school settings. As the student population is becoming increasingly diverse, it is important for Extension educators navigating diverse

environments to implement inclusive programs and ensure historically marginalized groups are included as part of program curriculum in relevant and meaningful ways (LaVergne, 2013). Attention to culturally responsive programming is also necessary to engage diverse populations and strengthen collaborative efforts in school and community settings (Aubrecht & Eames-Sheavly, 2012).

The Eagle Adventure program is an example of a culturally relevant and responsive program developed by the Chickasaw Nation Get Fresh! SNAP-Ed program staff in collaboration with partners in the Department of Nutritional Sciences at Oklahoma State University. The program was conceptualized after formative assessment with Native American families implicated type 2 diabetes as a major concern with recommendations that prevention education begin at a young age (Parker et al., 2011; Hermann, Jackson, Miracle, Parker, & Robertson, 2010). The Eagle Adventure was selected as one of four programs included as part of the Wave 1 Models of SNAP Education and Evaluation projects (U.S. Department of Agriculture, Food and Nutrition Service, Office of Research and Analysis, 2012). Since its inception as a pilot program in 2010, the program has reached over 3,000 youth and their families with positive outcomes related to food and physical activity preference and choice behaviors.

Eagle Adventure Program Description

The Eagle Adventure was designed as a semester-long program to address food and physical activity choices important for prevention of type 2 diabetes, obesity, and other chronic diseases. The Centers for Disease Control and Prevention's Eagle Books were selected as the central theme around which the curriculum was developed (Centers for Disease Control and Prevention, Native Diabetes Wellness Program, 2014). The Eagle Books and Eagle Adventure program embrace storytelling as an important teaching method and integrate the inspirational message of hope that type 2 diabetes can be prevented through dietary and physical activity changes.

The socio-ecological model was used as the framework for program design and social cognitive theory constructs such as self-efficacy, positive reinforcement, and role-modeling were selected as essential constructs to incorporate throughout the curriculum. The Eagle Adventure program includes the following components:

- Introduction to the Eagle Adventure program through a scripted-reading play (Figure 1) designed to generate interest in Eagle Book characters and enthusiasm for change. Youth from 4-H nutrition clubs are actors in the play.
- Four in-class lessons taught by positive role models who convey enthusiasm for food and physical activity changes. Each lesson includes Chickasaw language and cultural connections (Figure 2) designed to be adapted to the needs of collaborating tribes and partner programs.
- Daily announcements were developed to reinforce lesson messages. Messages were designed as school intercom announcements but some teachers have chosen to read announcements in class.
- Take home components were developed and include kid-friendly recipes with few ingredients, parent tip sheets reinforcing lesson concepts, *Nestwork* designed as health homework with probes for action and family-based physical activity ideas.

Figure 1.

Eagle Adventure Play Presented by 4-H Youth and Chickasaw Nation Staff



Figure 2.

Youth Learn Concepts of Balance Using a Mock Turtle Shell (Flying Disk)



Eagle Adventure Program Evaluation

Changes in food and physical activity knowledge, choice, and preference were measured by means of single group pre-post survey methodology. Students in Grades 1-2 completed the pre-survey approximately 1 week prior to program implementation and the post-survey approximately 1 week following program completion. The survey was read aloud to students, and pictorial representation of foods and physical activities were included on the survey to address readability aspects.

The survey design was chosen because it could be easily replicated by SNAP-Ed programs and Tribal organizations on a long-term basis. Most students in low-income schools often consume the majority of meals at school. As such, parents are frequently unaware of food and activity choices in school environments. Therefore, parents were not the focus of this evaluation.

Eagle Adventure Program Outcomes

Results presented are from two schools in Pontotoc County, the location of Chickasaw Nation headquarters. In order for schools to participate in the program, 50% of students had to be eligible to receive free or reduced priced lunches and the proportion of Native American students enrolled had to exceed 19%, Oklahoma's state average for the percent of Native American students enrolled in elementary schools. In this iteration of the Eagle Adventure program, two schools opted to participate that included Grades 1-2.

Paired t-tests were used to determine mean differences in food choice, physical activity choice, food knowledge, physical activity knowledge, food preference, and physical activity preference scores pre- and post-intervention (Table 1). The most significant differences at post-survey were related to physical activity. Students' intent to choose a physical activity over a sedentary behavior (PAC) was

significantly higher at post-survey. Further, preference to engage in a physical activity over a sedentary activity increased significantly at post-survey. In terms of food-related behaviors, choice of a healthy food over a less healthy food increased significantly at post as well as preference for vegetables. The scales related to food knowledge and fruit preference did not result in a significant change, but this may be due to scores being near maximum at pre-survey.

Table 1.
Differences between Student Pre- and Post-Survey Scores (n=370)

Variable	Intervention				
	Pre Mean (SE)	Post Mean (SE)	Difference Mean (SE)	<i>t</i>	<i>p</i>
Food Choice Score (FCS)	6.93 (0.07)	7.15 (0.06)	.22 (0.07)	3.14	0.002
Food Knowledge Score (FKS)	7.88 (0.03)	7.86 (0.03)	-.02 (0.02)	-0.65	0.513
Fruit Preference Score (FPS)	7.70 (0.04)	7.73 (0.04)	.03 (0.03)	0.97	0.333
Vegetable Preference Score (VPS)	6.35 (0.08)	6.56 (0.07)	.21 (0.06)	3.33	0.001
Physical Activity Choice Score (PAC)	6.52 (0.07)	7.11 (0.06)	.59 (0.07)	8.21	<0.001
Physical Activity Knowledge Score (PAK)	7.72 (0.04)	7.81 (0.04)	.09 (0.04)	2.36	0.019
Physical Activity Preference Score (PAP)	8.95(0.06)	9.21 (0.06)	.26 (0.06)	4.03	<0.001
FCS scores could range from 4-8; FKS scores could range from 4-8; FPS scores could range from 4-8; VPS scores could range from 4-8; PAC scores could range from 4-8; PAK scores could range from 4-8; PAP scores could range from 5-10.					

Overall, student acceptance of the Eagle Adventure and participation in take-home components was positive (Table 2). Over 95% of students who attended the Eagle Play indicated they liked the play. In terms of participation in take-home activities, reading the Eagle Books at home (78.3%) was the most frequently reported take-home component, with participation in Eagle games (69.3%) and Nestwork (66.1%) being the next most frequently reported.

Table 2.

Student Acceptance of Program Components and Participation in Take-home Activities (n = 370)

Survey Question	Yes n (%)	No n (%)
Did you see the Eagle Play?	336 (90.8)	34 (9.2)
Did you like the Eagle Play? ¹	324 (95.6)	15 (4.4)
At home, did you or anyone else in the family read the Eagle Books?	288 (78.3)	80 (21.7)
At home, did you ask a parent or adult to buy more fruits and vegetables?	238 (64.5)	131 (35.5)
At home, did you do the Eagle song and dance?	229 (62.1)	140 (37.9)
At home, did you make an Eagle recipe?	190 (51.4)	180 (48.6)
At home, did you play an Eagle game?	255 (69.3)	113 (30.7)
At home, did you do the Network?	242 (66.1)	124 (33.9)
¹ Percent based on the number of students who saw the Eagle Play.		

Implications

Results from this iteration of Eagle Adventure implementation and those from the SNAP-Ed Model Demonstration pilot indicate Eagle Adventure has the potential to positively influence food and nutrition-related behaviors among diverse youth in elementary schools. The curriculum was designed to reinforce the importance of traditional food and activity ways as healthful in a manner responsive to identified needs of community members. The program is important for addressing health-related behaviors and serves as a means of promoting diversity inclusion in Extension programming. For additional information about the Eagle Adventure visit www.eagleadventure.com.

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