

Research Article

Camp Power Up: An Evaluation of an American Diabetes Association Program to Target Children at Risk for Developing Type-2 Diabetes

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Abstract

Purpose: Camp PowerUp, sponsored by the American Diabetes Association, is a weeklong day camp for youth, ages 10-12 years at high risk for developing type 2 diabetes. Despite best efforts, San Antonio still faces a high rate of childhood obesity, especially in Hispanic/Latino populations. The purpose of this project is to implement and evaluate the efficacy of Camp PowerUp to decrease the risk of developing type 2 diabetes.

Methods: The program was evaluated using a mixed methods approach—qualitative and quantitative data through pre/post surveys given to the youth and their parents as well as quantitative data through TANITA Body composition scores of exact body mass indexes (BMIs) of the campers pre-camp and three months after.

Findings: The program was effective in teaching the parents/youth healthy living and active lifestyle as shown in the significant changes in 6 out of 9 (66.7%) pre and post survey questions for the adults ($p < .05$) and 6 out of 14 (42.8%) questions in the campers surveys ($p < .05$). When reviewing the journals, activity, exercise, healthy eating, and being healthy were common themes found everyday as well as diabetes, sugar, soccer, and vegetables being sub themes.

Conclusion: A SWOT analysis will also be done by the ADA-San Antonio planning board to address the strength, weaknesses, opportunities and threats from camp to prepare for 2018 as well as promote the start of camps in other cities with high prevalence of Type-2 diabetes.

Keywords: Childhood obesity; Hispanic youth; Type-2 diabetes; Health promotion and education;

Introduction

My favorite thing was learning to stay active. I learned how to eat healthy and how all the food I like are unhealthy and bad for my body” (Diego, age 12)

Methodology

We used pre/post survey design that focused on factors that cause diabetes as well as importance of diet and exercise such as: *How much of your plate should be filled with fruits and vegetables?* We also analyzed 49 journal entries collected at the end of the day. The pre and post surveys were given to all attendees of the camp as well as their guardians.

Camp Power Up was hosted at the YMCA fitness center in a hispanic community the program was sponsored by the local community HEB and Walgreens as well as universities within San Antonio. Camp Power Up is a week long educational program with focus on diabetes education, nutrition, physical activity and obesity prevention alongside a fun-filled environment. There were also two field trips to the local museum, and nearby university. Our study was approved by the institutional review board at the University of Health Science Center at San Antonio.

Each day of camp was nine hours with a lunch around noon. The meals we pre-approved by a dietician and prepared by local sponsors. Each meal adhered to the MyPlate approach where half of the plate is fruits and vegetables, one-fourth protein and one-fourth grain. The youth were also encouraged to drink only water for the entire

week while at camp. Snacks were also pre-approved by dieticians and consisted of portion size healthy snacks such as fruits and butterless popcorn. Each day of camp had a unique focus on a specific topic which included how to read labels, the ideal sugar intake for a day, and the importance of exercises. At the end of camp the youth were able to participate in recess as well as join in a yoga class. Thus the camp was able to expose the youth to healthy lifestyles in an interactive environment.

During participant observation, researchers joined in on the health and wellness sessions alongside the campers as well as the exercises completed during the camp. This allowed for a thorough assessment of the camp to create a SWOT analysis at the end of the program.

Overall, there were forty-nine hispanic/latino youth that completed the camp from start to finish. The ages ranged from 8-16 with 42% being female and 58% male. All youth campers had to be recommended by their primary physician as well as present signs of at least one risk factor- overweight with BMI over the 95% percentile, family history of Type-2 Diabetes, diagnosis of hypertension, diagnosis of hyperlipidemia, diagnosis of fatty liver, hemoglobin A1c

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in the range 5.7%-6.4% or diagnosis of polycystic syndrome. The highest prevalent risk factor among the camp was an overweight BMI which was 95% followed by a 94% of youth having a family history of Type-2 Diabetes.

There were also 49 adult parents/guardians surveyed pre and post camp. All of the parents/guardians were self-identified minorities, either black/african american (1), hispanic/latino (47), or native American (1). The demographics of the parents/guardians were 74% female and 26% male.

One main source of qualitative data was analyzed using standard textual analysis: journal entries used by the children to document what they "learned, liked, and tried" each day of the camp. Data was coded to a theme and subtheme with emergent themes being identified by frequency (Figure 1). Quantitative data came from pre surveys and post given to the campers as well as their guardians. A summary T-test for independent samples was run for each question. Frequency of correct answers allowed for us to assess retention of knowledge learned during the camp sessions. Other quantitative data included anthropometric measurements- height and weight- which were assessed on the first day of camp. BMI was calculated as body weight divided by height squared. Measurements of fat mass and percentage were taken as well using a TANITA body analyzer system. Blood pressure measurements were taken using a standard manual mercury sphygmomanometer in a seated position by a physician. Analytic procedures of recording glycosylated hemoglobin (HbA1c) were measured using a portable A1CNow+ system.

Results

"What I liked about the camp is that it made me very active for the entire week. I learned how to stay active all the time and I will carry this information with me for the rest of my life" (Jonathan, age 11)

Survey Data-Parents/Guardians:

Pre and post surveys were collected of the guardians during the camp. At the end of the day there were optional bilingual parent classes that paralleled what the youth had learned such as how to read nutrition labels. Parent session attendance remained steady at 25% each day for the week with 75.6% of guardians attending three or more classes. Since assessments were done during registration at the beginning of camp as well as camp graduation, forty-one out of forty-nine (83.6%) of parents/guardians were able to complete both pre and post surveys. Out of those, six out of nine (66.67%) questions saw significant changes between pre and post surveys which included. The following are results for each of the significant survey questions. *How confident are you in reading a nutrition label to find the amount of sugar in the food?* For this question, 40.8% said very confident in the pre-survey versus 57% in the post survey ($X^2=10.726$, $df=2$, $p=.05$). *When reading a food label, the nutrition information about the food-like the calories, sodium, and fiber-is based on how many servings?* The correct answer was one, and the percentage of those who chose two went from 10.2% to 0% ($X^2=8.579$, $df=2$, $p=.014$) while the percent of those who chose the correct answer became 100%. *How much of your plate should be filled with fruits and vegetables?* In the pre-survey 59% chose half of the plate versus 68% in the post survey ($X^2=6.039$, $df=2$, $p=.049$). *How confident do you feel that you can order healthy meals at restaurants?* In the pre-survey 30.6% said very confident versus 58.5% in the post survey ($X^2=8.104$, $df=2$, $p=.017$). *In a typical day, how physically active is your child (walking, biking, sports, etc.)* In the pre-survey 38.7% said 30-45 minutes versus 58.5% in the post survey

($X^2=5.766$, $df=2$, $p=.05$). *In a typical week, how often do you plan for your family to be physically active?* 32.6% said they plan 3-4 times a week in the pre survey versus 70.7% in the post survey. Also, 40.9% said they did not plan exercise in the pre survey versus 14% in the post survey ($X^2=13.267$, $df=2$, $p=.001$).

Survey Data-Campers:

Pre and post surveys were collected of the campers during the camp. Each day of the week there were focus topics such as reading nutrition labels, healthy plate and BMI definition that the campers were taught by a pediatrician. Forty-five out of forty-nine (91.8%) of parents/guardians completed both pre and post surveys. Out of those, six out of fourteen (42.8%) questions saw significant changes between pre and post surveys. The following are results for each of these significant survey questions. *Which of these help you determine your healthy weight (BMI)?* 51% said all of the above (your age, height, gender) in the pre-survey versus 75% in the post-survey ($X^2=8.218$, $df=3$, $p=.036$). *How much of your plate should be filled with fruits and vegetables?* 61% said half of the plate in the pre survey versus 82% in the post survey ($X^2=5.943$, $df=2$, $p=.042$). *How many times within the last week have you eaten fruits and vegetables?* 51% said 3 or more times in the pre-survey versus 84% in the post-survey ($X^2=12.535$, $df=2$, $p=.001$). *How often do you read food labels on products in your own home?* 42.8% said rarely or never in the pre-survey versus 17% in the post-survey ($X^2=11.531$, $df=2$, $p=.003$). *When reading a food label, the nutrition information about the food-like the calories, sodium, and fiber-is based on how many servings?* 73% said one in the pre survey versus 44% in the post survey ($X^2=8.671$, $df=3$, $p=.013$). *How often do you participate in moderate physical activity?* 26.5% said more than 60 minutes per day in the pre survey versus 62.2% in the post survey ($X^2=12.322$, $df=2$, $p=.002$).

Anthropometric data

In addition to survey data, biomarker data was collected pre and post camp as well as one month post camp. This includes body mass index(BMI), fat mass percentage, and weight the campers. The biomarker data were taken using a TANITA body composition analyzer system. On the first day of camp, the mean weight for females (age 9-16) was 175 lbs, BMI was 31 and fat mass percentage was 42.6%. The mean weight for the males (age 8-16) was 168 lbs, BMI was 29.03 and the mean fat mass percentage was 36.05%. On the last day of camp, the mean weight for females dropped to 156 lbs, BMI 30.5, and fat mass percentage was 41.85%. The mean weight for males was 186 lb,

BMI of 32.4 and fat mass percentage of 41.3%.

Overall, the average body weight for all youth changed from 166.9 lb pre camp to 167.4 post camp. This is an average so does not reflect the individual weight lost in the campers which was seen. The average fat mass percentage for all youth dropped from 40% to 38% post camp. The average BMI value remained consistent at 30.5 which is expected since significant weight loss does not occur within one week. However the total pounds lost with all youth campers was 22.2 lbs, fat mass was 147.8 lbs, and fat percentage lost was 2.9%.

Campers Journal Entries

Campers were given a journal to write what they tried, liked, and learned at the end of each day. Common themes are terms repeated each day of camp whereas subthemes are terms used to describe the common theme (Figure 1). On day one there were 73% completed

Common Themes	Subthemes
Activity	Dancing
	Losing weight
Exercise	Friends
	Workout
	Basketball
	Yoga
	Karate
Healthy Eating	Soccer
	Vegetables
	MyPlate
	Calories
	Sugar
Being Healthy	Fruit
	Mindful Eating
	Food labels
	Diabetes

entries, day two had 81.6%, day 3 had 65.3%, day four had 57% and day five had 80%. This inconsistency was addressed in the SWOT analysis for the next evaluation. Activity was a key theme in youth explanations of the impact that the camp had in their lives. Healthy eating was another key theme seen throughout the journals which is shown below. When the youth discussed healthy eating it was normally followed with ideas from the sub theme. In this instance the sub theme would be MyPlate as the camper mentioned they learned what a healthy plate would consist of.

“Today I learned that staying active is fun, I’ve never been to a camp and i’m glad that I get to experience the activity that camp power up provides. I tasted a variety of foods, it wasn’t the best but at least I tried. Also I learned more about different types of foods and what a healthy plate should contain” (Leila, age 10)

Figure 1: Themes found in campers journals. When analyzing the campers daily journals these were the common themes and subthemes discovered.