

Outcome Evaluation: Healthy Habits Program



BOYS & GIRLS CLUBS
OF COACHELLA VALLEY

Prepared by



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Executive Summary

The Boys & Girls Clubs of Coachella Valley (BGCCV) began a new program for local club participants called the Healthy Habits program. This program, supported by the Humana Foundation, was designed to improve the health and wellness of participants. Main program components included both fitness classes and nutrition classes offered once a week over the course of ten weeks at three different clubs in the Coachella Valley.

BGCCV partnered with the Health Assessment Resource Center (HARC) to evaluate the program's effectiveness in improving participant health. The evaluation design included pre and post tests of health knowledge, behaviors, and objective outcomes. A total of 54 children between the ages of 9 and 17 participated in the data collection and the program.

Results showed that health knowledge significantly improved from Time 1 to Time 2. Participants also reported higher levels of exercise each week, along with higher levels of fruit consumption. Objective measures showed that participants' aerobic capacity also increased over the course of the 10 weeks, such that participants were more fit and able to run more at Time 2 than they were at Time 1.

Further in-depth analysis showed that attendance at fitness classes significantly predicted health knowledge at Time 2. This relationship was such that for a participant who only attended one fitness class, their predicted Time 2 score on a 10-item knowledge test was only a 6, while a participant who attended all 10 fitness classes had a near-perfect predicted score, over 9 questions out of the 10 correct. Additionally, results demonstrated that nutrition class attendance significantly predicted aerobic capacity. This relationship was such that for a participant who had only participated in one nutrition class, their predicted aerobic capacity score would fall into the "health risk" category. However, for a participant that attended all 10 nutrition classes, their predicted aerobic capacity score would fall into the "healthy fitness zone" where all children should score.

Overall, these results indicate that the Healthy Habits program is effective at improving the health of program participants, in terms of knowledge, behavior, and physical outcomes. It is clear that the fitness and nutrition portions of the program work in tandem together, and therefore, it is not recommended to present one without the other.

Introduction

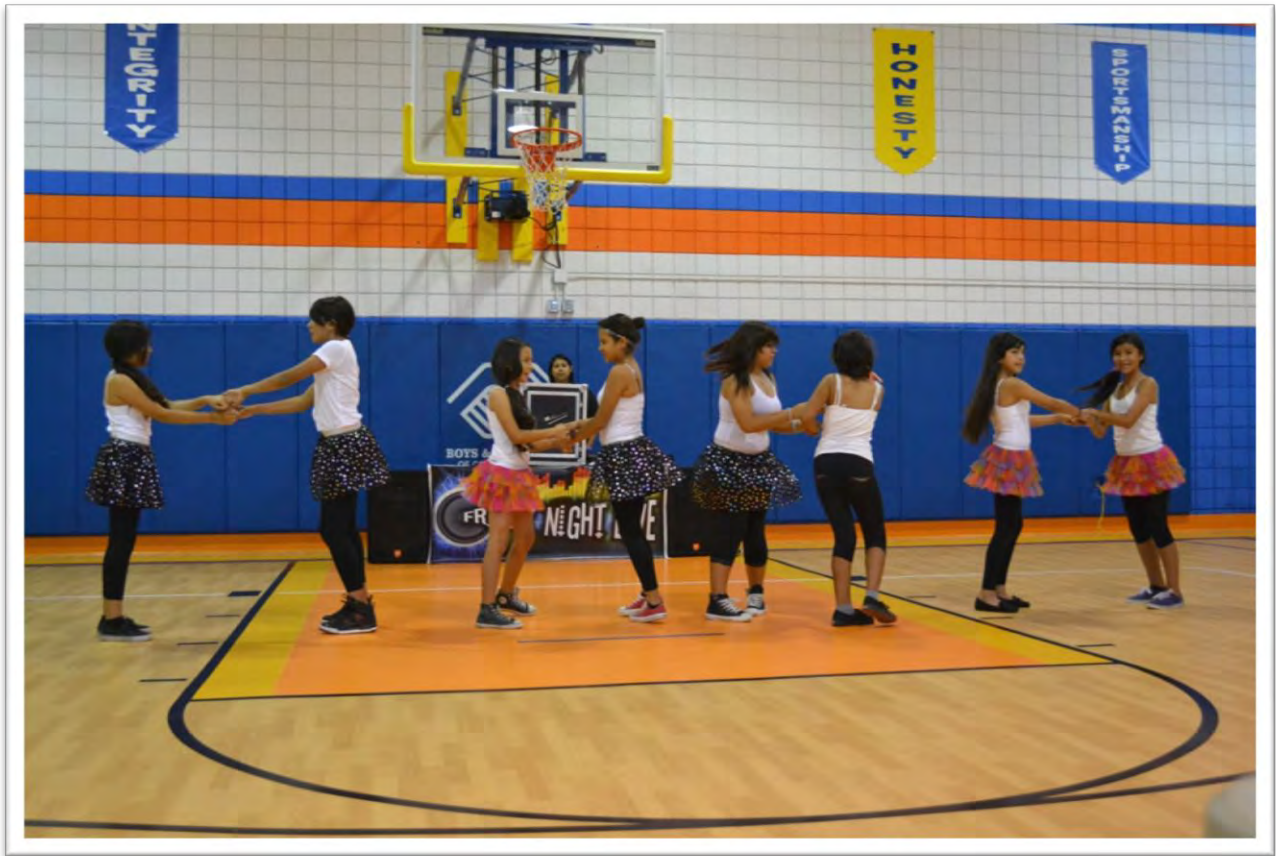
In 2012, the Boys & Girls Clubs of the Coachella Valley (BGCCV) created a new program, called the Healthy Habits program, designed to improve the health and wellness of program participants. The Healthy Habits Program was supported by the Humana Foundation.

The design of the Healthy Habits Program originated from portions of the Triple Play Program, which is a wellness endeavor of the Boys & Girls Clubs of America that is sponsored by the Coca-Cola Company and the WellPoint Foundation. These materials were subsequently adapted and others were added.

The resulting program was a 10-week program with two primary components: fitness classes and nutrition classes.

Fitness Classes

Each week, athletic directors began with an hour of physical activity. This fitness class was typically comprised of a warm-up period, a moderate to intense workout period that focused on circuit training, and a stretching and cool down period. Each fitness class lasted about an hour.



Healthy Habits participants demonstrate dance routines at Community Family Night held at the Indio club.

Nutrition Classes

Each week after the fitness class, students transitioned to the nutrition classes.

Nutrition classes began with 20 to 25 minutes of lecture. The topics of these lectures varied, and included subjects such as portion control, learning to read and interpret food labels, the importance of eating a wide variety of fruits and vegetables, basic food preparation principles, identifying food cues that triggered overeating, and more.

Each of these lectures was followed by a hands-on activity where students created a healthy snack using the principles they had just learned.



A Healthy Habits participant shows off his healthy snack.

Other Program Components

In addition to the weekly fitness classes and weekly nutrition classes, the Healthy Habits program included several other components. Six “Parent Nights” were held over the course of the 10 weeks. On average, about eight families attended each of these events.

At these events, parents and family members were given educational materials regarding various health topics, including healthy eating and family exercise. These events also gave Healthy Habits program participants a chance to demonstrate the cooking skills they had learned in the program by preparing meals for their families. Several of these “Parent Night” sessions also provided information and free resources about Supplemental Nutrition Assistance Program (SNAP). For these sessions, the Boys & Girls Clubs partnered with FIND Food Bank’s Foodstamp Outreach program to raise awareness of available resources and help get qualified families enrolled in the program.



Healthy Habits participants serving healthy snacks.

The Healthy Habits program also included efforts to connect with their community. This portion of the program was designed to help participants engage with their communities and families, and build positive relationships while sharing the knowledge and skills they had acquired through the Healthy Habits program.

Participants attended the Indian Wells Chamber of Commerce's Second Annual Health and Wellness Fair. At this event, participants manned a vendor booth, where they prepared healthy snacks on the spot and distributed them to the public. The Healthy Habits program was also showcased on the event's main stage, where program participants demonstrated dance routines for the public.

Evaluation

To assess the impact of this new program, the BGCCV partnered with Health Assessment Resource Center (HARC). In order to measure potential changes in health due to the Healthy Habits program, the evaluation was designed to include a pre-test and a post-test for all student participants. These pre- and post-tests included a variety of health indicators, including knowledge tests, self-reported behavior, and objective measures of health.

BGCCV staff members administered these various pre-tests one week prior to the start of the Healthy Habits program. Ten weeks later, at the end of the program, the same tests were administered to the same students who had participated in the Healthy Habits program. The BGCCV provided this data to HARC, where it was subsequently cleaned and analyzed. This report covers the results of this program evaluation in depth. For assistance in interpretation, please contact the author of this report, Dr. Jenna LeComte-Hinely, at HARC.

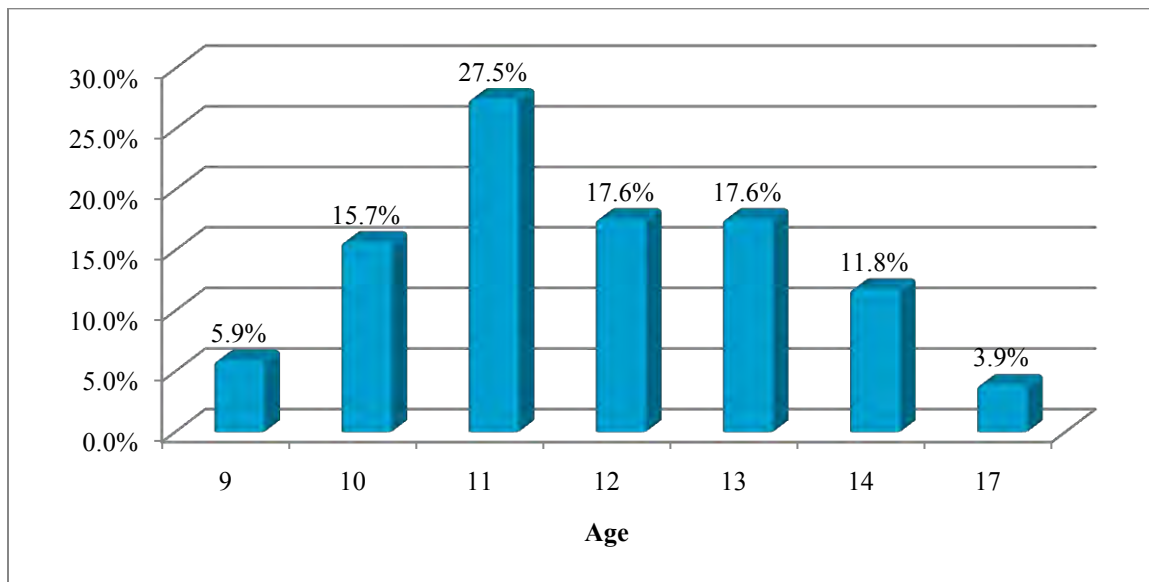
Demographics

A total of 54 children participated in data collection for the Healthy Habits program at Time 1 and Time 2. This demographic information, obtained from the Time 1 data collection, provides detail about the children that participated in the Healthy Habits program.

Age

Children in the program ranged from 9 years old to 17 years old. The average age of participants was about 12. The majority of participants were between 11 and 13 years old. See Figure 1 for the age distribution of participants.

Figure 1. Age Distribution of Participants



Race and Ethnicity

Healthy Habits participants were all racial minorities, as illustrated in Table 1.

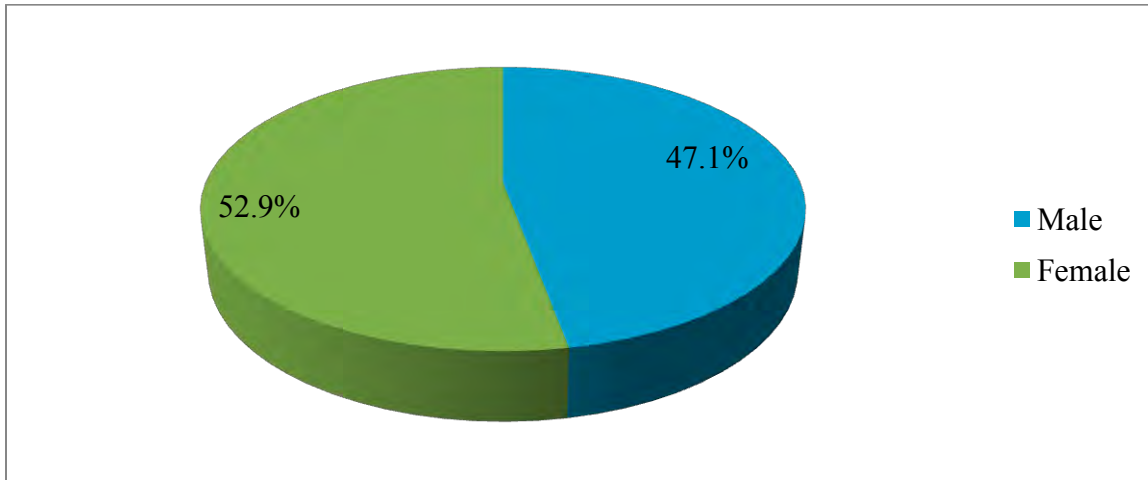
Table 1. Race and Ethnicity of Participants

| Race/Ethnicity | Number of Participants | Percent of Total |
|---|------------------------|------------------|
| Hispanic/ Latino | 47 | 87.0% |
| African American | 3 | 5.6% |
| 2 or more (African American/White, African American/Hispanic) | 3 | 5.6% |
| Not specified | 1 | 1.9% |
| Total | 54 | 100.0% |

Gender

Both genders were adequately represented in the participant pool. Slightly more than half of participants (52.9%) were female, but overall the sample was balanced, as illustrated in Figure 2.

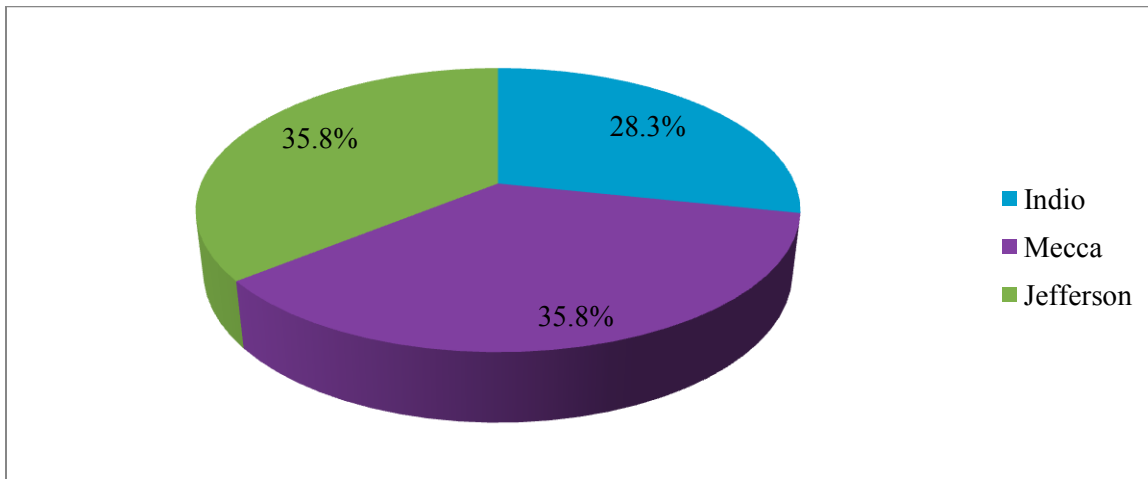
Figure 2. Gender of Participants



Location

Participants in this Healthy Habits pilot program came from three different clubs: Indio, Mecca, and Jefferson. As illustrated in Figure 3, the participants were nearly evenly split across the three clubs, with no one club dominating the sample.

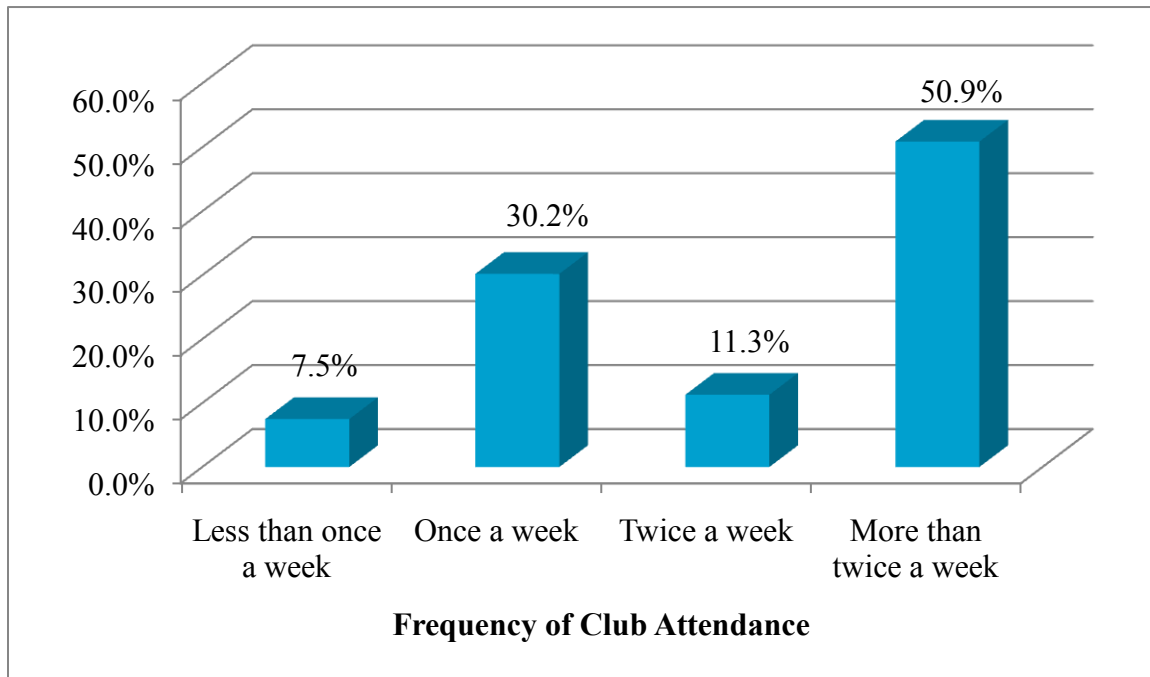
Figure 3. Club Location of Participants



Club Attendance

The majority of participants in the Healthy Habits program visited the Boys & Girls Clubs very frequently, typically more than twice per week, as illustrated in Figure 4. Only 7.5% of participants visited the Boys & Girls Clubs less than once per week, indicating that the majority of the sample spends significant time at the Boys & Girls Clubs each week, and thus, that it is likely that the Club has an impact on their activities and behaviors.

Figure 4. Club Attendance of Participants



Methods

The Healthy Habits program was designed to improve the health and wellness of program participants. “Health” is an extremely broad term, and can encompass a wide variety of factors, making it difficult to adequately measure outcomes of interventions aimed at improving health. However, most outcome measures can generally be grouped into three categories: increased knowledge, changed behavior (such as an increase of healthy behaviors or a decrease of unhealthy behaviors), and altered physical state (such as weight loss, strength increase, disease cures, etc). Generally speaking, these outcomes are usually related to one another, such that an increase in knowledge leads to a change in behavior which leads to improved physical outcomes. The BGCCV obtained outcome measures in each of these three categories.

Knowledge Outcomes

Three surveys were developed to assess the participants’ knowledge regarding health and nutrition: one for children between ages 6 and 8, another for children between ages 9 and 12, and a third for children between ages 13 and 18. These surveys were based on Triple Play programming. Each of the surveys asked 10 questions that tested participants’ knowledge regarding health and nutrition, in age-appropriate language. Participants were given this survey prior to beginning the Healthy Habits program (Time 1), and then again, 10 weeks later, after they had participated in the Healthy Habits program (Time 2).

Behavioral Outcomes

The nutrition survey used to measure knowledge also included several questions that assessed participants’ current level of physical activity and their recent consumption of a variety of fruits and vegetables. These questions were asked at Time 1 and at Time 2.

Additionally, a second survey was designed in order to assess whether participants proactively made time for physical exercise. This survey was adapted from a tool developed by Engage Learning, called “Exercising Control of Your Physical Activity Survey”. The original survey contained 20 items; the adapted and finalized survey used in this study contained 12 items. Overall, these 12 items measured how often participants actively took control of their physical exercise habits, such as scheduling time for exercise, setting exercise goals, participating in a variety of exercise activities, or seeking out people to exercise with. This instrument assessed how frequently participants proactively pursued a physically active lifestyle. It was also administered at both Time 1 and Time 2.

Physical Outcomes

The BGCCV collected several important physical indicators, such as height, weight, age, and gender. These figures, along with a physical fitness test, allowed for the calculation of two important measures of health: body mass index and aerobic capacity.

Body Mass Index (BMI)

Body Mass Index, or BMI, is a ratio between height and weight, and is widely regarded to be a reasonable indicator of obesity. For adults, BMI numbers indicate weight status (underweight, normal weight, overweight, and obese). However, for children, different procedures are taken, given that growth patterns vary widely. Thus, children's weight status is determined using an age and gender-specific percentile for BMI. Growth charts from the Centers for Disease Control and Prevention (CDC) are utilized to determine BMI-for-age and gender percentiles. These percentiles are the most frequently utilized pediatric clinical indicator of size and growth.

Percentiles indicate a child's position with regard to a reference population of other children in the U.S. of the same age and sex. For example, 25% of children of the same age and sex are at or below the weight of a child at the 25th percentile of BMI-for-age, and 75% of children of this age and sex weigh more.

Generally speaking, children whose BMI-percentile is at or below 5% are classified as underweight, while those whose BMI-percentile is at or below 85% are classified as normal weight. Children whose BMI-percentile falls between the 85th and 95th percentiles are classified as overweight, while children at or above the 95th percentile are considered obese.

In order to obtain the data needed to calculate BMI, the BGCCV weighed participants, measured their height, and had the children self-report birth date and gender. HARC subsequently used this data to calculate BMI percentiles via the widely accepted formula and parameters provided by the CDC. This data was collected at both Time 1 and Time 2, allowing for BMI calculations at both time periods.

Aerobic Capacity

BMI is extremely widely used and accepted as one measure of fitness (weight status). However, an individual can be normal-weight, but still not be physically fit and able to engage in the physical exercise needed to enjoy a healthy life. Thus, to capture a different aspect of physical fitness, this study utilized the California Department of Education's physical fitness test, FITNESSGRAM.

FITNESSGRAM provides a standardized method of measurement and set standards for three areas of physical fitness: aerobic capacity, body composition, and muscle strength. The current study focused on the aerobic capacity of the FITNESSGRAM. Aerobic capacity is the maximum rate of oxygen uptake in a person's body. Higher scores indicate that an individual is able to process greater amounts of oxygen, indicating higher fitness levels. Research shows that having high levels of aerobic capacity is associated with reduced risk of many diseases and illnesses, including high blood pressure, coronary heart disease, obesity, diabetes, and cancer.

As per FITNESSGRAM protocol, aerobic capacity in this study was captured by the 20 meter Progressive Aerobic Cardiovascular Endurance Run (PACER). In this test, the students are required to run 20 meter laps at increasing paces until they reach their maximum speed. The number of laps completed are then combined with students' height, weight, gender, and age to

calculate VO_2 max scores. VO_2 max is widely accepted as the best way to measure aerobic capacity, as it measures the maximum rate of oxygen uptake.

It is worth noting that the FITNESSGRAM protocol is not recommended for children under the age of 10, and thus, several members of the current sample were not included. Additionally, if a child is unable to run 10 laps total, this is considered too low to be used to calculate a VO_2 max score. This means that students who are especially unaccustomed to exercise may have no VO_2 max score at all.

VO_2 max scores are categorized into one of three categories, according to FITNESSGRAM standardized guidelines. Based on the student's age and gender, VO_2 max scores are placed into the following categories (from most healthy to least healthy): the healthy fitness zone (HFZ), needs improvement, and needs improvement-health risk.

Results

Results showed that at Time 1, participants had middle-of-the-road levels of health knowledge, high levels of fruit and vegetable consumptions, and lower-than-recommended levels of physical activity. About two thirds of participants were physically fit (as categorized by BMI and VO₂max standards).

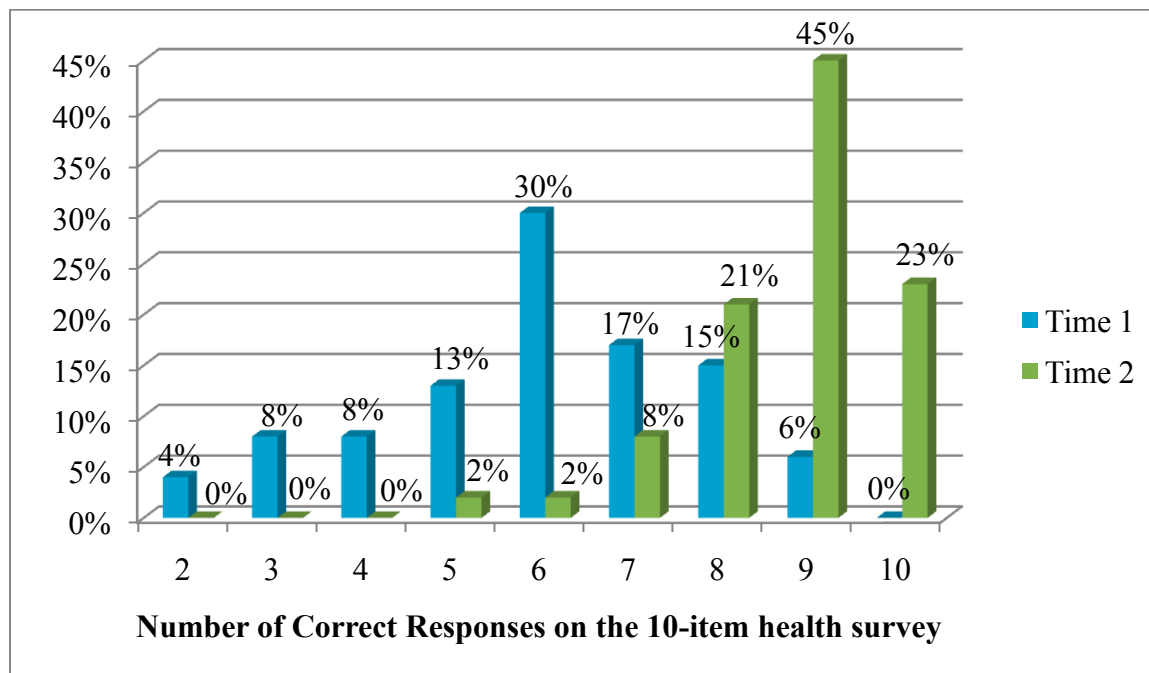
Overall, results showed that knowledge, health behaviors, and objective health outcomes all improved from Time 1 to Time 2. After completing the Healthy Habits program, participants had improved knowledge about health and nutrition, were active more often, consumed more fruits and fruit juices, and had better aerobic capacity levels.

Knowledge

At Time 1, the average participant scored a 5.98, or 60% correct, on the knowledge survey. No participants scored a perfect 10 out of 10. Similarly, no participants missed all 10 questions, as illustrated in Figure 5.

By Time 2, however, the average score increased significantly to 8.74, or nearly 90% correct, $t(52) = -9.119, p < .001$. Nearly a quarter of participants scored a perfect 10 out of 10. This demonstrates that across the sample, participant knowledge significantly improved over time.

Figure 5. Health Knowledge Scores



$n = 53$.

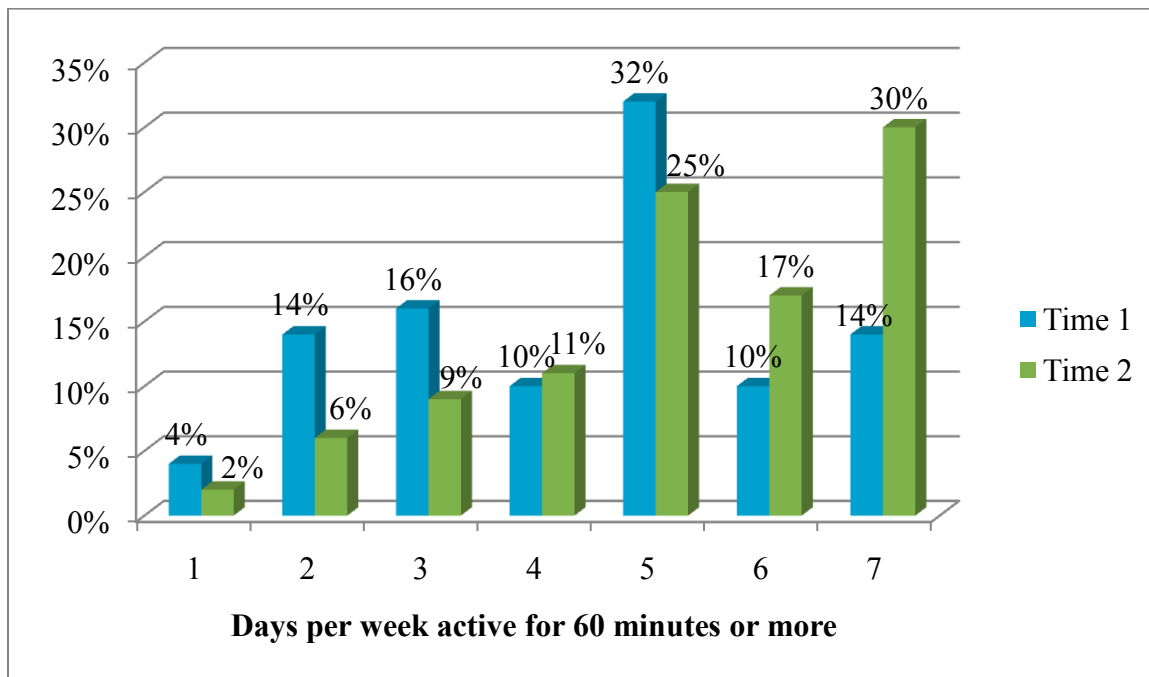
Behavior

Exercise

The CDC recommends that children get 60 minutes or more of exercise every day of the week. According to the children's self-reports, only 14% of participants met this recommendation at Time 1, as illustrated in Figure 6. Results show that on average, participants were physically active for at least 60 minutes per day 4.4 days per week at Time 1.

By Time 2, however, this number had significantly increased. At Time 2, participants were physically active for 60 or more minutes per day an average of 5.2 days per week, $t(49) = -3.110$, $p < .01$. The percentage of children getting the recommended 60 minutes or more of exercise 7 days per week more than doubled; at Time 2, nearly one third of participants were exercising the recommended amount, as illustrated in Figure 6.

Figure 6. Physical Exercise Frequency at Time 1



$n = 50$.

More specific questions regarding physical activity were asked of individual age groups. See Table 2 for further details. Results of a paired-samples t-test indicated that the average number of days per week 13 to 18 year-old participants were active at the BGCCV significantly increased from Time 1 to Time 2, $t(16) = -2.4$, $p < .05$. This indicates that by Time 2, the older participants were significantly more active at their respective clubs.

Table 2. Physical Activity Frequency

| Question | Age Group | Number of Participants | Average days per week at Time 1 | Average days per week at Time 2 |
|--|-----------|------------------------|---------------------------------|---------------------------------|
| Number of days per week exercised at all (no time stipulation) | 9 to 12 | 33 | 4.9 | 5.0 |
| Number of days per week physically active at the BGCCV | 13 to 17 | 17 | 3.4* | 4.6* |
| Number of days per week physically active in school PE | 13 to 18 | 17 | 3.3 | 3.4 |

Note: Statistically significant differences are starred.

The physical activity survey asked students to rate how frequently they participated in 12 positive activities, such as enjoying exercise, cross-training, setting exercise goals, and limiting sedentary activities. To analyze the physical activity survey, each response was given a numeric score consistent with the participant's frequency. "Nearly always" was given a score of 3, "often" was 2, "sometimes" was 1, and "never" was 0. To allow for analyses, these responses were then summed. Thus, a participant that indicated they never participated in any of the 12 activities would have a score of zero, while a participant who indicated that he or she nearly always participated in every one of the 12 activities would have a score of 36.

At Time 1, scores on this survey ranged from 4 to 35, illustrating a broad spectrum of physical activity experiences ($n = 50$). The average participant had a score of 22.3, indicating that most students exercised a moderate amount of control over their physical activity.

By Time 2, the average score had significantly increased to 28.6, $t(49) = -7.65, p < .001$, indicating that participants were taking more control over their physical activity and engaging in more physical activities. Additionally, the range of scores now spread from 19 to 35, indicating that the participants who didn't engage in hardly any of these positive activities now engaged in several of them with high frequency.

Fruit and Vegetable Consumption

Participants were asked to indicate how many times in the past 24 hours they had consumed several specific fruits and vegetables. The minimum score on each question was zero (indicating the child had not consumed that particular type of fruit or vegetable in the past 24 hours) and the maximum was 5 (indicating they had consumed that particular fruit or vegetable 5 times in the past 24 hours). The specific questions are illustrated in Table 3.

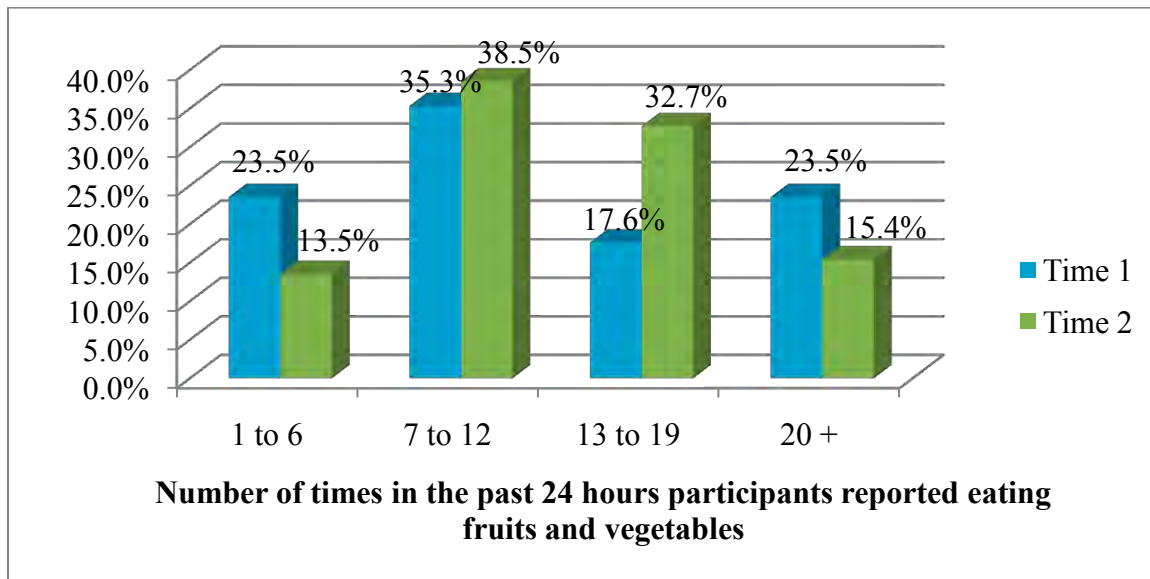
Table 3. Fruit and Vegetable Consumption at Time 1

| How many times in the past 24 hours did you... | Average Time 1 | Average Time 2 |
|--|----------------|----------------|
| Drink 100% fruit juice | 2.33* | 2.83* |
| Eat fruit | 2.33* | 2.87* |
| Eat green salad | 1.33 | 1.58 |
| Eat potatoes (not fried) | 1.82 | 1.87 |
| Eat carrots | 1.65 | 1.51 |
| Eat other vegetables | 2.29 | 2.52 |
| Total | 12.12 | 13.33 |

Note: Statistically significant differences are starred.

Overall, the results were high, indicating that the average participant had consumed fruits and vegetables about 12 times at Time 1 and an average of about 13 times at Time 2. Fruit juice consumption had a statistically significant increase from 2.33 times at Time 1 to 2.83 times at Time 2, $t(53) = -2.10, p < .05$. Fruit consumption also experienced a statistically significant increase from 2.33 at Time 1 to 2.87 at Time 2, $t(53) = -2.67, p < .05$. The other types of fruits and vegetables did not experience a statistically significant increase in consumption. While the fruit and vegetable consumption increased from Time 1 to Time 2 (as illustrated in Figure 7), this change was not statistically significant.

Figure 7. Overall Fruit and Vegetable Consumption at Time 1



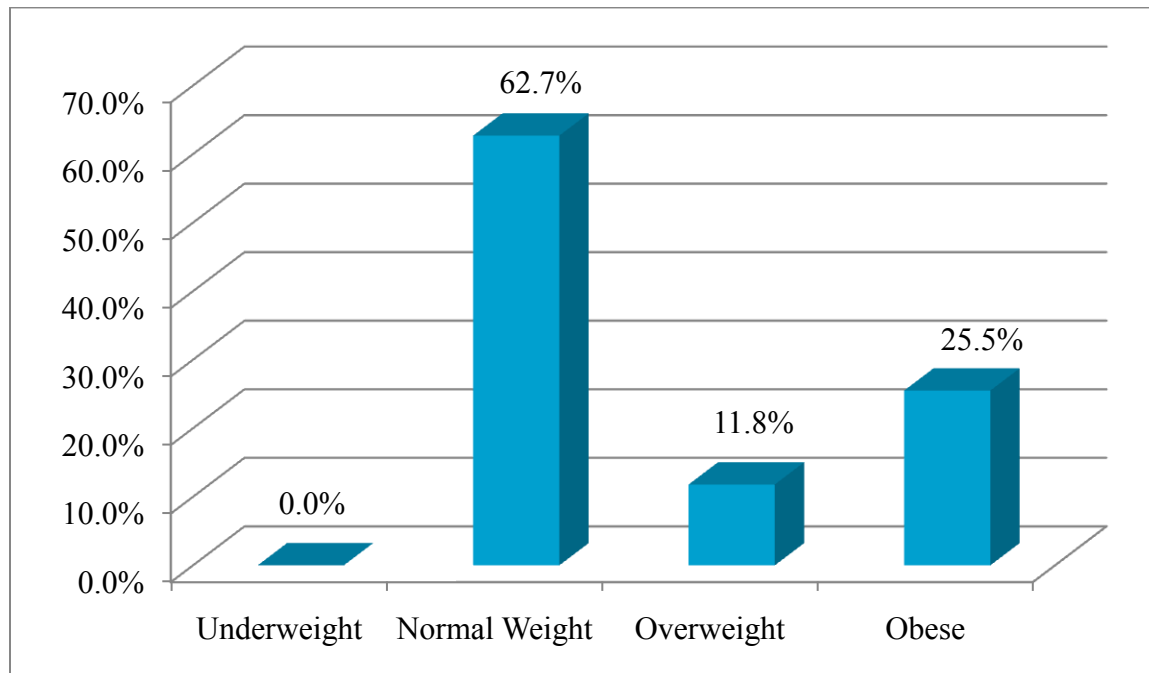
$n = 51$.

Physical

BMI

Results indicate that the majority (62.7%) of the participants in the Healthy Habits program were normal weight for their age, gender, and height. No children in the sample were considered underweight, however, as illustrated in Figure 8, a little over one third of the program participants (37.3%) were considered overweight or obese for their age, gender, and height. BMI did not change at all over time, that is, participants' BMI at Time 2 was identical to their BMI at Time 1.

Figure 8. BMI Categories



n = 51.

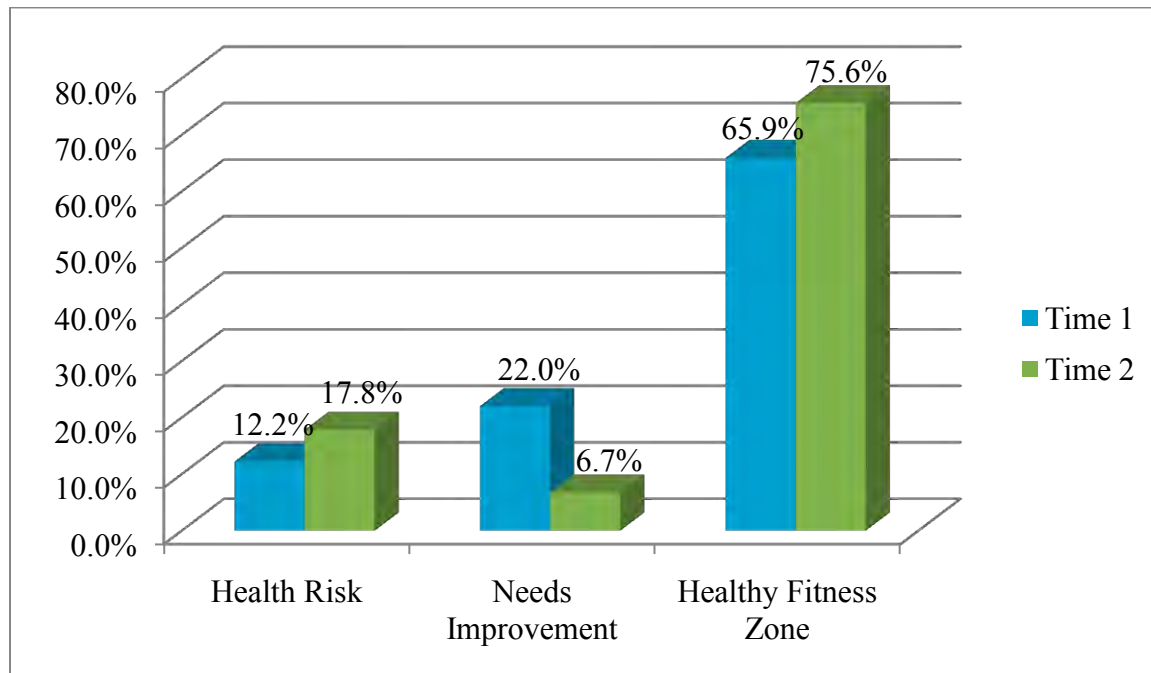
It is not surprising that BMI did not change over the 10-week period. BMI is slow to change, and there is a wide variety of factors that influence BMI that are out of the control of the Healthy Habits program coordinators (such as food consumption at home). It is likely, however, that if program participants continue the behavior changes that developed over the course of the program (increased exercise and increased fruit consumption) that the children in the overweight and obese categories are likely to lower their BMI over a longer period of time.

Aerobic Capacity

VO₂max significantly increased over the course of the program; the average VO₂max score at Time 1 was 41.68, but by Time 2 the average score had risen to 43.56, $t(36) = -5.2, p < .05$.

These raw VO₂max scores were subsequently transformed into categories, based on the California Department of Education’s FITNESSGRAM standards. The breakdown of these categories is presented in Figure 9. At Time 1, 24 students had VO₂max scores that were categorized as in the targeted “Healthy Fitness Zone” (or “HFZ”). By Time 2, this number had increased to 33 students.

Figure 9. VO₂max Categories



Time 1 $n = 41$, Time 2 $n = 45$.

Five students scored in the “health risk” category at Time 1. Their VO₂max scores significantly improved over time from an average of 31.86 at Time 1 to 33.74 at Time 2, $t(4) = -5.194, p < .01$. Two of the five “health risk” students increased their scores by an entire category, subsequently falling into the “needs improvement” category at Time 2.

Eight students scored in the “needs improvement” category at Time 1. Their VO₂max scores increased from 38.43 at Time 1 to 40.03 at Time 2, however, this change was not statistically significant, $t(7) = -1.882, p > .05$. Six of these eight students improved a category into the “HFZ” category. Of the remaining two students, one maintained a “needs improvement” classification, while the other dropped down a category into the “health risk” category.

Twenty-four students scored in the “HFZ” category at Time 1, indicating their physical fitness levels were already high at the start of the Healthy Habits program. However, the VO₂max scores for these students also significantly improved over the course of the program, rising from

an average of 44.81 at Time 1 to 46.78 at Time 2, $t(23) = -4.066, p < .001$. This indicates that even those individuals who were physically fit at the start of the program gained aerobic capacity over the course the program. All 24 students who scores in the “HFZ” at Time 1 maintained that category at Time 2.

An additional six students that had endurance scores too low to calculate VO₂max scores at Time 1 were able to run enough laps at Time 2 to actually have a VO₂max score. In fact, three of these individuals increased all the way to the “HFZ” category—an increase of three entire categories. The categorical changes are all represented in Table 4.

Table 4. VO₂max Score Category Change from Time 1 to Time 2

| Type of Change | Specific Change | Number of Students | Valid % of students |
|------------------------|---|--------------------|---------------------|
| Positive Change | Any Type | 8 | 19% |
| | <i>Health Risk to Needs Improvement</i> | 2 | 5% |
| | <i>Needs Improvement to HFZ</i> | 6 | 14% |
| No Change | Any Type | 28 | 65% |
| | <i>HFZ to HFZ</i> | 24 | 56% |
| | <i>Needs Improvement to Needs Improvement</i> | 1 | 2% |
| | <i>Health Risk to Health Risk</i> | 3 | 7% |
| Negative Change | Needs Improvement to Health Risk | 1 | 2% |
| Other Change | Any Type | 6 | 14% |
| | <i>Too low to health risk</i> | 3 | 7% |
| | <i>Too low to HFZ</i> | 3 | 7% |

Impact of Class Attendance

The Healthy Habits program’s major components included 10 physical fitness classes and 10 nutrition classes. On average, children in the Healthy Habits program attended about 8 fitness classes over the 10 weeks and about 7 nutrition classes. Children who took one type of class were significantly more likely to take the other type of class ($r = .328$). See Table 5 for descriptive statistics on class attendance.

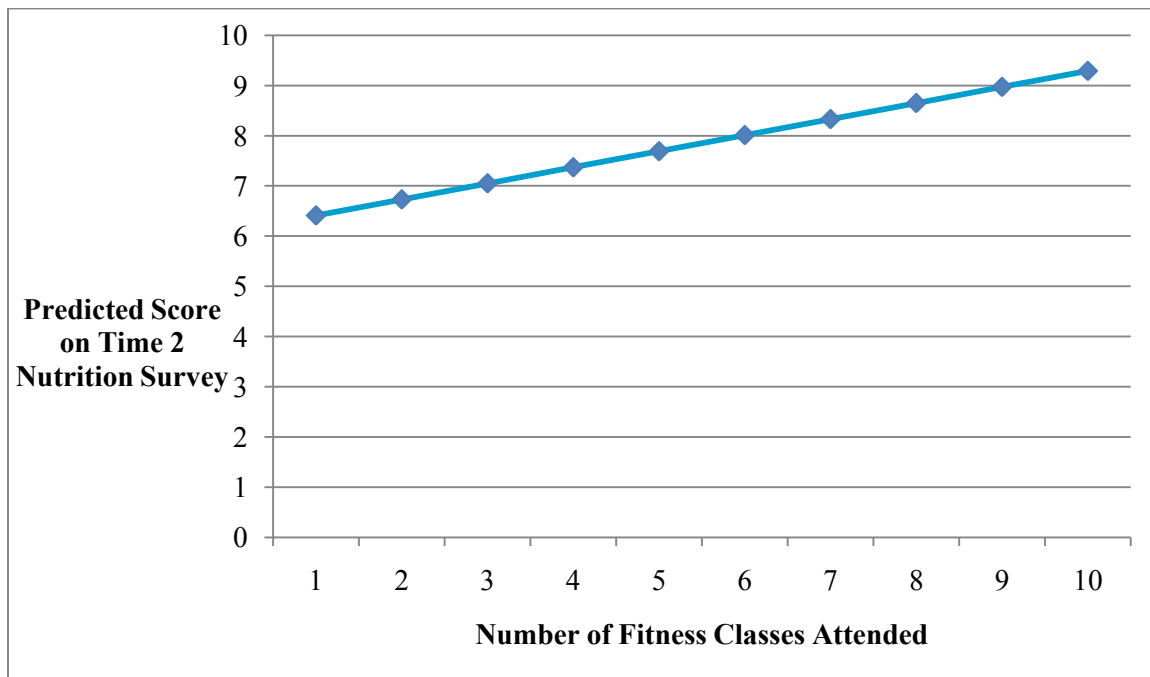
Table 5. Class Attendance

| Type of Classes | Minimum Attendance | Maximum Attendance | Average Attendance |
|-----------------|--------------------|--------------------|--------------------|
| Fitness | 6 | 10 | 8.28 |
| Nutrition | 2 | 10 | 7.26 |
| Total | 10 | 20 | 15.52 |

Fitness Classes

Results of a linear regression showed that fitness class attendance significantly predicted the student’s Time 2 scores on the knowledge survey, such that the more fitness classes a child had attended over the 10 weeks, the higher their score was on the health and nutrition survey. Specifically, for every additional fitness class a student attended, there is an increase of .32 points on the predicted knowledge score, $F(1, 51) = 8.05, p < .01$. For example, a student that only attended one fitness class would have a predicted score of 6.32, while a student who attended all ten fitness classes has a much higher predicted score of 9.29. See Figure 10 for an illustration of this relationship.

Figure 10. Fitness Classes and Health Knowledge Score at Time 2

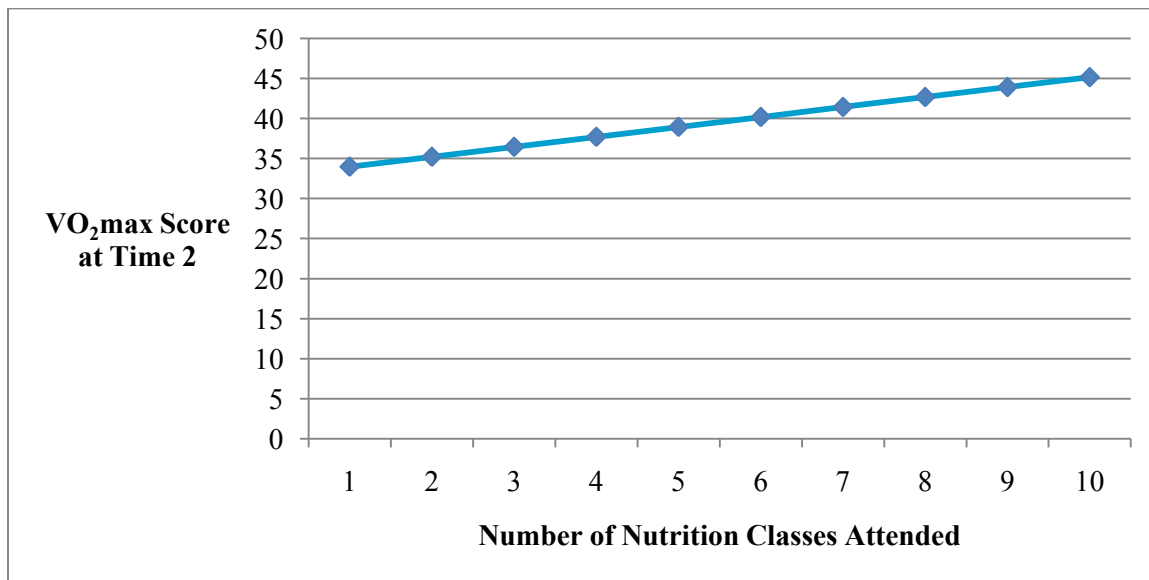


Fitness class attendance was not statistically significantly related to other Time 2 outcome measures such as fruit and vegetable consumption, number of days of exercise, scores on the physical test, or VO₂max scores.

Nutrition Classes

Nutrition class attendance significantly predicted student VO₂max scores at Time 2, $F(1, 44) = 4.849, p < .05$. Nutrition class attendance explained 9.9% of the overall variance in VO₂max scores. For every additional fitness class a student attended, there was a 1.243 point increase in their VO₂max score. Based on this, a student who had only attended a single nutrition class would have a predicted VO₂max score of 33.98, which is in the “health risk” category for every gender and age category defined by the California Department of Education. In contrast, a student who had attended all ten nutrition classes would have a predicted VO₂max score of 45.164, which is in the HFZ for every age-gender combination, as per the California Department of Education. See Figure 11 for an illustration of this relationship.

Figure 11. Nutrition Classes and VO₂max Score at Time 2



Nutrition class attendance was not statistically significantly related to other Time 2 outcome measures such as fruit and vegetable consumption, number of days of exercise, scores on the physical test, or predicted score on the nutrition survey.

Conclusion

Based on the results presented here, it is clear that the Healthy Habits program had a positive impact on participants' health and wellness. Over the course of the 10-week program, health knowledge, healthy behavior, and physical health outcomes all improved. This evaluation was not a randomized controlled trial in design, and thus, it cannot be *proven* that the Healthy Habits program caused these positive changes. While it is possible that these changes are due to forces other than the effects of the Healthy Habits program, it is unlikely. Thus, the BGCCV can feel confident knowing that the Healthy Habits program does indeed reach programmatic goals: participants who have gone through the program are better informed about health facts, more likely to exercise and eat right, and more likely to be physically fit.

Interestingly, fitness class attendance impacted knowledge outcomes, whereas nutrition class attendance impacted physical outcomes, which is counterintuitive. While additional data may provide clear answers to the underlying causes of this relationship, it aptly illustrates how interconnected health is, such that learning can affect behavior and behavior can affect learning. Based on this finding, it would be unwise to focus only on a single component of the program (such as just nutrition classes) without the complementary other component.

Based on the analysis, HARC would recommend the following changes to future evaluation of the Healthy Habits program:

- When asked to report on their fruit and vegetable consumption, participants' self-reports were implausibly high (for example, eating fruits and vegetables 30 times in the past 24 hours). It may be that some participants misunderstood the question. Based on this, future questions regarding consumption should be altered for clarification. It may also be helpful to create a method to assess serving size, as that would then enable a comparison of eating habits to those recommended by the American Dietary Guidelines.
- When asking participants to self-report on their physical activity, the questions should be asked of participants of all ages, rather than broken out by groups. Additionally, it is redundant to ask participants how many days they exercise and then how many days they exercise 60 minutes or more. HARC recommends cutting out the question that was posed to 9 to 12 year-olds about how many days they exercise (without the time clarification), as it doesn't add much to the knowledge base.

