

Grand Challenges Final Paper

Group 5 (The HIVE Team)

21 April 2014

How might we reduce the prevalence of childhood obesity by using elementary schools as the vehicle to promote healthy lifestyles?

THE PROBLEM

Problem Statement and Significance (1-2 paragraphs)

In recent times, obesity rates have risen dramatically and brought much attention to the impacts and causes of the issue. According to the Weight-control Information Network (WIN), roughly 30% of children 2 - 19 years old are deemed to be obese or overweight [1]. About, 80% of overweight children grow up to be overweight or obese adults [2]. Being obese raises a person's chances of certain diseases like type 2 diabetes, heart disease, and high cholesterol. According to the CDC medical costs related to obesity were estimated to be as high as \$147 [3]. People who are obese have medical cost about %1,429 higher than the cost for people of a normal weight. HIVE is a project aimed to reduce the prevalence of childhood obesity by using elementary schools as a vehicle to promote healthy lifestyles.

In order to tackle such a broad problem like obesity, one must first look at the roots of the problem to determine a solution. Because of the thin line between being obese and overweight in children, the solution space addresses all children in order to decrease the impacts of childhood obesity. Thus, childhood obesity is worth solving because many countries around the world have increasing rates of childhood obesity, causing larger governmental and individual health care costs and complications that follow children into adulthood.

Context of the Problem (1 paragraph)

Childhood obesity is a vast problem that directly affects the children and their families, as well as indirectly affecting taxpayers, insurance companies, and the food industry. Childhood obesity is the number one health problem for children and adolescents in the United States today [4]. Many of the key causes of childhood obesity are rooted in societal factors, such as unhealthy lifestyles, inactivity, and poor prenatal care. Essentially, the prices of foods with a high energy density, or foods that have higher fat and calorie content per pound, are decreasing relative to the rising prices of healthier foods. Therefore, it is easier and much more affordable for parents, restaurants, and schools to purchase unhealthy food [5]. This increases the dietary fat included in children's diets, which causes increased fat storage [6]. This is

exacerbated by a decrease in childhood activity. Many children would rather stay inside during their free time and schools provide a limited amount of recess [6].

THE SOLUTION

Goal (1 paragraph)

Our goal is to have a working meter and website by fall of 2015. This project is 100% attainable and something our group is dedicated to accomplishing. We want to develop a product that is well made and worthy of our time. There are many steps along the way including building a prototype, testing the website, and attaining COPA compliance, but we are committed to stand by our program and see how far we can take it.

Solution Description (1 paragraph)

HIVE is an interactive program that takes multiple aspects of children's lives and implements health knowledge. HIVE begins in schools where children spend 7 hours a day and then moves to family life. The HIVE program begins with education. The initial step is to integrate health lesson plans into elementary school teaching plans. These lessons cater to a teachers lessons and their student's abilities. Each lesson is informative and interactive all designed to promote healthy lifestyles. The second step is to implement pedometer technology and an interactive website to encourage active and healthy lifestyles. The final step is to have the students present their knowledge to their peers and parents in a creative way to solidify their knowledge as well as teach others the benefits of living healthy lifestyles.

Objectives and Status Update (2-3 pages)

Objective 1: Set up and design the experiment.

This objective involved selecting an experimental school, creating study groups, identifying metrics for experimentation, and defining measures to use for success for the research.

Status: This objective was completed during the Fall 2013 semester. Over the summer, members of our team met with Duluth Mayor Nancy Harris and identified Chattahoochee Elementary School as a potential school to conduct the experiment. After meeting with the Assistant Principal, Sheldon Harris, the team received permission to begin designing the experiment for 3 classrooms (two control rooms and one experimental). Over the course of the summer, members worked to identify learning objectives and health topics that would be covered by the class. During the fall, a final list of health topics was created based off Gwinnett County's mandated curriculum. From this, the team developed the health knowledge pre-and-post assessment.

During the Fall, the team also received IRB approval to conduct the research, and also set the foundations for a future publication. While doing this, the team established the final metrics that would be used for data analysis. The metrics will include presidential fitness data taken before and after the program, health knowledge tests, changes in class activity, and overall class data from the state CRCT test.

Modifications: The only modifications to this objective were the sample size of the experiment. Originally, the team planned on conducting the program in a whole school. After looking deeper into the logistics and goals of the experiment, the team decided that they implement the program on a smaller scale to ensure reliable data and coordinated lesson plans.

This objective will officially be completed when the health lesson and health fair are completed at the end of the Spring Semester. In the remaining weeks, the team will finish collecting data from the Physical Education Teacher and also distribute the final health knowledge assessment.

Objective 2: Creative and Educational Final Project

This objective involves producing educational projects, involving the teachers and students in order to teach the benefits of adopting a healthy lifestyle to other students.

Status: This objective was completed April 16, 2014. After the health lesson plans were taught, the students were split into six different groups. Each group was given a health topic taught in the lesson plans to then teach to other kindergarten classes. Over the course of 3 weeks, members from HIVE went to Chattahoochee Elementary School to help the groups create their final projects, which ranged from videos, skits, posters, and even Prezi presentations. During the fair, three different kindergarten classrooms visited each group and learned about various health topics. Despite the minimal time HIVE members had with the students to create their final projects, the event ran very well and every group was able to finish a successful final project where they showcased their knowledge from the health lessons.

Modifications: Due to the amount of snow days, the original health play had to be modified to fit a smaller time frame. As a result, the team restructured the health play and turned it into a Health Exploration Fair, which featured students creating their own projects to explain health topics to other classes.

Objective 3: Pedometer and Interactive Website

This objective utilizes pedometer technology in conjunction with an interactive website in order to promote living a healthy lifestyle and health education.

Status: This objective will be over Thursday, April 24, 2014 after the final assessment is given. The HIVE group continued to use the company Zamzee as the pedometer technology, but many problems were found with their product. Therefore, the HIVE group is in the beginning stages of developing their own pedometers and interactive website. This new website will be personalized and geared towards specific audiences, and the pedometer will be more wearable and desirable. Surveys are currently in the making in order to discover user preferences regarding the pedometer and the website. Once that step is completed, the HIVE group can delve further into production of these.

Modifications: Due to the wearability of the Zamzee pedometers, students continued to lose or break their Zamzees, which posed a problem to the HIVE group. Luckily, they had

enough replacements to just give out, but a more sustainable solution must be discovered before production of the HIVE meters.

Objective 4: Healthy Lunch Options

This objective encouraged healthy eating habits through offering healthy lunch options in schools.

Status: This objective was postponed until further notice. After meeting with Nancy Harris, mayor of Duluth, Georgia and former elementary school principal, it was decided that trying to get public schools to adopt healthier lunch options was too daunting of a task for the group to complete. It would take cooperation of government officials, and the group did not possess enough power to carry any weight. Also, this task would require the government to reallocate more funds towards school lunches, which in the government's eyes, is not an attractive option.

Modifications: The group is going to reinstate this objective once they have more proof of results, which will likely occur after the group reruns their own program in Chattahoochee Elementary in Spring 2015. This way, they will have developed credibility when working with the government officials and parents will also be more receptive of the change.

How has your project changed over time? (1 paragraph)

The main way that our project has changed over this semester has been with the creative health arts show. The original plan was to do a class play and perform it for Kindergarten classes. The play would include information the students learned over the semester. However, this plan was dropped because the snow days took away vital time that we needed to prepare the students. Instead, we decided to allow the students to do small projects themselves and present those to some Kindergarten classes. These projects included a prezi presentation, poster projects, and also three videos. The purpose of the health fair was still accomplished and the students had a great time doing it.

THE FUTURE

Future Implications and Next Steps (1-2 paragraphs)

The future of our project has become the main focus of our group. We have decided to try and develop our own exercise meter and interactive website in order to better target the students. We plan on forming the HIVE Health Products Company and selling the HIVE program to individuals and schools. The HIVE program will include a website where individuals can see their exercise progress as well as receive personalized health advice. The Next steps to accomplish this plan involve product environment research, communication with Wahoo Fitness, and hard

work on developing the website. Product environment research will involve sending surveys to elementary school students all over the state of Georgia to learn what they need in an exercise meter. Communication with Wahoo will help us with hardware, coding, and business advice. The website work will be a long project developing the interface and personalization

Works Cited

[1] <http://win.niddk.nih.gov/statistics/index.htm>

[2] <http://health.usnews.com/usnews/health/healthday/071205/overweight-kids-often-become-obese-unhealthy-adults.htm>

[3] <http://www.cdc.gov/chronicdisease/resources/publications/aag/obesity.htm>

[4] <http://www.vaxa.com/childhood-obesity-statistics.cfm>>.

[5] <http://www.iom.edu/~media/Files/Report%20Files/2004/Preventing-Childhood-Obesity-Health-in-the-Balance/FactSheetSchoolsFINALBitticks.pdf>

[6] Davies, H. Dele., Hiram E. Fitzgerald, and Vasiliki Mousouli. "Causes of Childhood Obesity." Obesity in Childhood and Adolescence. Westport, CT: Praeger, 2008. N. pag. Print