

THESIS

ASSESSING THE OUTCOMES AND ACCEPTABILITY OF *HEALTHY LIFESTYLES FOR
YOUTH CORPS MEMBERS*: PHASE 2 OF A MULTI-PHASE PROJECT

Submitted by

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ABSTRACT

IMPLEMENTING A *HEALTHY LIFESTYLES FOR YOUTH CORPS MEMBER*

CURRICULUM: PHASE TWO

Background: Obesity is a costly condition that can reduce quality of life and increase the risk of several chronic diseases. Obesity has a multi-factorial etiology, which includes genetic, behavioral, and environmental factors (Baranowski 2000). Such a complex disease needs a complex solution such as changing public policy and the environment. In addition, people must be given knowledge and self-efficacy to live healthy lifestyles. The obesity epidemic is not limited to adults. Childhood obesity is a growing problem. In 1980, 6.5% of children aged 12-19 years were obese and this number increased statistically to 19.6% in 2008 (CDC 2010). According to the 2007 National Survey of Childhood Health the obesity rate in Colorado for youth ages 10-17 is 14.2%. Children in Colorado are ranked 29th out of the 50 states for obesity (Trust for America's Health 2010). The committee on prevention of obesity in children and youth encourages the evaluation of interventions that focus on preventing an increase in obesity prevalence, improving dietary behaviors, increasing physical activity levels, and reducing sedentary behaviors (Koplan et al 2005).

There are several obesity prevention and intervention programs targeting youth, however, most of these efforts have been school-based or limited to school-aged children. The Youth Conservation Corps is a population not reached through these efforts. Traditionally, many of the youth employed by the Youth Corps have been low-income, at-risk, and ethnic minorities. There are currently no prevention programs targeting this audience and there have been no previous efforts addressing the health outcome of Youth Conservation Corps members.

Objective: The first objective of this project (phase 2) was to revise the *Healthy Lifestyle for Youth Corps Members* curriculum based upon the pilot test with 13 corps members of phase 1 of the project. The second objective for phase 2 of this project was to implement the *Healthy Lifestyles for Youth Corps Members* and analyze changes in knowledge, attitudes, and behaviors regarding healthy lifestyles.

Methods: Revisions to the curriculum were made based on the data collected during the first phase of the project and from suggestions made by researchers at Colorado State University and the Colorado Youth Corps Association. Data used in assessing changes in knowledge, attitudes, and behavior was collected using a survey that was tested for validity and reliability prior to implementation. In addition, the acceptability of the program was assessed by feedback from the corps members provided via the post-survey and crew leaders' instructor notes pages, which were located at the end of each unit specifically for crew leaders to fill out and offer feedback. Implementation and control group sites included Western Colorado Conservation Corps, Mile High Youth Conservation Corps, Larimer County Youth

Conservation Corps, Southwest Conservation Corps –Four Corners and Southwest conservation Corps- Las Valles.

Results: One hundred corps members in Colorado completed the program, 58 from the implementation group and 42 from the control group. The average age of all the participants was 20 years. When testing for knowledge only two questions had significant results. Many of the knowledge questions had a ceiling effect, as the corps members already knew the answer leaving no room for improvement. In addition, many of the corps members were already engaging in healthy lifestyle behaviors prior to the implementation of the *Healthy Lifestyles Curriculum*. Feedback from the crew leaders and corps members suggested that the curriculum was too basic and they suggested that the curriculum should contain more in depth information. However, there were corps members who enjoyed the curriculum and the younger corps members generally rated the curriculum as more acceptable.

Conclusions: The results of this study suggest that this sample of Colorado Youth Corps members in this study were not representative of all Colorado Youth Corps. The average age of participants in 2009 was 18 years and in our study, the average age was 20 years. In addition, in 2009 there was more ethnic diversity than the sample in phase 2. Many corps members in this study already had the knowledge about living healthy lifestyles. Changes to the curriculum could include combining units 2 and 3 and units 4 and 5. In addition, incorporating more in depth information could enhance the effectiveness of this curriculum in the future.

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TABLE OF CONTENTS

Chapter 1: Introduction	1
Chapter 2: Review of Literature	4
Obesity in Youth and Young Adults.....	4
Role of race, ethnicity and socioeconomic status.....	7
Role of diet and physical activity.....	8
Obesity prevention strategies.....	10
Behavior and obesity prevention.....	16
Nature of the Youth Conservation Corps.....	17
Phase One.....	19
Summary.....	28
Chapter 3: Methods	30
Phase 2.....	30
Revising the Curriculum.....	31
Assessing the validity and reliability of the survey.....	36
Subject recruitment and selection.....	37
Training.....	38
Data Collection.....	41

Data Analysis.....	42
Chapter 4: Results.....	44
Characteristics of Participants.....	45
Results for Changes in Attitudes and Behaviors.....	47
Results for Changes in Knowledge.....	52
Program Acceptability.....	57
Corps Member Feedback.....	57
Crew Leader Feedback.....	59
Chapter 5: Discussion.....	72
Study Findings.....	73
Changes in Attitudes and Behaviors.....	73
Changes in Knowledge.....	75
Program Acceptability.....	80
Strengths and Limitations.....	80
Chapter 6: Conclusions and Recommendations.....	83
Conclusions.....	83
Recommendations.....	84
Chapter 7: References.....	88

Appendices.....	92
Appendix A: Institutional Review Board Letter of Approval.....	93
Appendix B: Sample Corps Member Guide.....	94
Appendix C: Sample Crew Leader Guide.....	96
Appendix D: Survey.....	98
Appendix E: Addendum to the Survey.....	99
Appendix F: Behavior Outcomes Ages 20 years and under.....	100
Appendix G: Qualitative Results Ages 20 years and under.....	101
Appendix H: Additional Figures for Knowledge Questions.....	107

LIST OF TABLES AND FIGURES

Tables

Table 2.1: Ethnicity of Corps Members in 2009.....	19
Table 2.2: Social Cognitive Theory Constructs.....	24
Table 4.1: Demographic Information.....	46
Table 4.2: Average Age of Youth Corps Members by Crew.....	46
Table 4.3: Pre and Post Survey Responses Question 3.....	47
Table 4.4: Within Subject Contrast for Behavior.....	48
Table 4.5: Between Subjects Contrast for Behavior.....	49
Table 4.6: Difference in Knowledge Score between Groups.....	53
Table 4.7: Difference in Knowledge Score between Survey.....	54
Table 4.8: Paired Sample T-test for Knowledge.....	57
Table 4.9: Acceptability of Each Unit and of Overall Curriculum.....	58

Figures

Figure 2.1: CYCA map of Youth Corps in Colorado.....	17
Figure 4.1: Difference in Meals Prepared Outside of Home.....	49
Figure 4.2: Difference in Fruit Consumption.....	50
Figure 4.3: Difference in Vegetable Consumption.....	51
Figure 4.4: Difference in Knowledge Score for Question 9.....	55
Figure 4.5: Difference in Knowledge Score for Question 12.....	56

CHAPTER 1

INTRODUCTION

Obesity is a growing health threat that has reached epidemic proportions and it is estimated that by 2015 more than forty percent of all US adults will be obese (Biro and Wien 2010). Results from the National Health and Nutrition Examination Surveys (NHANES) show the percentage of persons who are obese increased from 12% in 1991 to almost 18% in 1998 and is continuing to increase (Mokdad 1999). In addition, four out of the forty-five participating states had obesity rates of 15% or higher in 1991 and by 1998 thirty-seven states had rates higher than 37% (Mokdad 1999). Obesity is a costly condition that can reduce quality of life and increase the risk of several chronic diseases and can eventually cause premature death. The current health service cost of obesity is estimated to be about 9% of the overall cost but the social cost of the condition is difficult to measure (Lean 2006). The national health care expenditures related to obesity and overweight in adults alone have been estimated to range from approximately \$98 billion to \$129 billion after adjustments for inflation (Koplan et al 2005). For the year 2006, medical costs associated with obesity were estimated to be as much as \$147 billion and obese persons had estimated medical costs that were \$1,429 on average higher than persons of normal weight (CDC Morbidity and Mortality Weekly Report (MMWR)

2010). According to the Centers for Disease Control, tobacco use may no longer be the underlying cause of death in the United States and death due to poor diet and physical inactivity has been increasing since 2000. Smoking rates are dropping and obesity is on the rise and according to the Centers for Disease Control obesity was expected to surpass smoking as the prevailing underlying causes of death by 2005.

American society is 'obesogenic', which means that most Americans live in an environment that promotes increased food intake, plentiful amounts of energy dense foods, and physical inactivity. Obesity clearly has a multi-factorial etiology including genetic or physiological, behavioral, and environmental factors (Baranowski 2000). In addition to changing public policy and environment for solving the obesity epidemic, people must be given the knowledge and self-efficacy to live healthy lifestyles. The government objectives for Healthy People 2010 called for a reduction in the proportion of children and adolescents who are overweight or obese, but this goal has not been reached and obesity trends continue to rise (Ogden 2010, CDC 2010).

Multiple networks of public and private organizations may be engaged to coordinate a variety of interrelated and ideally, mutually reinforcing interventions that can be delivered through diverse channels such as the mass media, health care providers, schools, religious institutions, community based organizations, worksites, government agencies and businesses (Baranowski 2000). Research based knowledge about the design, implementation, and effectiveness of community based intervention programs with children and young adults are limited, but such

strategies are feasible. Community channels provide important opportunities for targeting and evaluating new types of intervention programs.

The purpose of this project was to implement a healthy lifestyles program specifically designed for members of the Colorado Youth Conservation Corps. This review includes studies investigating obesity in youth, existing obesity prevention strategies and programs, and the nature of the youth corps.

CHAPTER 2

REVIEW OF THE LITERATURE

The purpose of this project was to implement the second phase of a *Healthy Lifestyles* program designed for members of the Youth Conservation Corps in Colorado. This review includes the investigation of obesity in youth, the role of diet and physical activity, existing obesity prevention strategies, phase one of the program, and the nature of the youth corps.

Obesity in youth and young adults- nationally and within Colorado.

The growing obesity epidemic is not limited to adults and childhood obesity is a rapidly increasing problem. There is a common belief that dietary preferences and practices are learned at an early age and carry over into the adult years (Baranowski 2000). Overweight children are more likely to become overweight adults, especially those with a higher body mass indexes or BMIs (see page 5 for definition). Adolescents who have a higher BMI experience 30% higher rates of mortality as young and middle-aged adults (Biro and Wien). Obesity during the adolescent years is associated with many adverse health consequences. Dietary habits, physical inactivity, and rates of obesity become worse with the transition from the teen to the young adult years. Obesity during the adolescent years is

associated with an increased risk of multiple co-morbidities in adulthood. For example, obese children and adolescents are more likely to have risk factors for cardiovascular disease than their slender counterparts. Researchers concluded that epidemiological studies consistently find a positive association between anthropometric measures of obesity in childhood and those in adulthood. School aged obese or overweight children were up to 6.5 times more likely to become obese adults (Serdula 1993).

Body mass index (BMI) is the most common and practical method for determining overweight and obesity. BMI is used to screen for overweight and obesity in children and adolescents because it is relatively easy to obtain height and weight measurements, however BMI is not a direct measure of body fatness (CDC 2010). Based on current recommendations and terminology used by the Institute of Medicine and the American Academy of Pediatrics, children with BMI values at or above the 95th percentile of the sex-specific BMI growth charts are categorized as obese (Ogden 2010). Overweight is defined as a BMI at or above the 85th percentile and lower than the 95th percentile. The prevalence of obesity of 6 to 19 year old American youth has tripled from about 5% in 1988-1994 to about 16% in 1999-2002 (Tudor-Locke). Based on the adult definition of obesity which is 12.6% of adolescents aged 12 through 19 years were obese in 2007-2008 (Ogden 2010).

In Colorado, 8.4% of the population (both children and adults) was obese in 1991 compared to 14% in 1998, which is a 66.6% increase (Mokdad 1999). According to the CDC, in 2009 18.6% of the population in Colorado was obese. In

addition, the Colorado Department of Public Health and Environment the obesity rate in Colorado has climbed faster than the rate for entire United States population, rising 89 percent from 1995 through 2008 and the national obesity rate rose 67% from 1995 through 2008. The data suggest that there needs to be a higher priority for the development of strategies and programs for weight maintenance as well as weight reduction (Mokdad 1999). In Colorado, it is estimated that 13% of children are overweight and 14% are at risk of becoming overweight (Tudor-Locke). There is a high prevalence of obesity in the Southeast and parts of the Midwest and low prevalence in New England and parts of the Rocky Mountains for both adults and children (Tudor-Locke 2007). Despite lower rates of obesity in Colorado the rates are steadily increasing for all states and there is a need for prevention strategies.

In 2005-2006 10.9% of children nationwide, aged two through 19 years were at or above the 97th percentile of the 2000 BMI for age growth charts (Ogden 2008). Data indicate that 15.5% of American children are at risk of becoming overweight and 20% of school-aged children in the United States are overweight (Tudor-Locke 2007).

There is an increasing incidence of diseases related to obesity in children. Type II diabetes mellitus was previously very rare in children and is now becoming an increasing problem. For children born in the United States in 2000, the lifetime risk of becoming diagnosed with type II diabetes at some point in their lives is estimated at 30% for boys and 40% for girls if obesity rates level off (Koplan 2005).

However, based on national trends, obesity rates continue to increase and thus the prevalence of type 2 diabetes in youth.

Specific “obesogenic” factors that may be driving childhood obesity include the marketing of energy-dense foods and beverages and the increased use of video games and TV watching (Swinburn 2009). Obesity can be considered an inevitable consequence of the commercial successes of industries creating an overconsumption of food and labor saving devices. The public health approach to obesity prevention would be to prevent unhealthy weight gain in the first place (Swinburn 2009). This could occur either in children and adolescents or in young adults. Prevention of pediatric obesity should include dietary, physical activity and behavioral components as part of a multidisciplinary intervention (Bennett and Sothorn 2009).

Role of race, ethnicity and socioeconomic status

Minority and lower socioeconomic groups are disproportionately affected by obesity, but the relationship is complex (Biro and Wien 2010). Low socioeconomic status is associated with a reduction of quality-adjusted life years (Biro and Wien 2010).

Racial and ethnic disparities in obesity prevalence among U.S. children and adolescence are significant (Ogden CDC 2010). The prevalence of obesity was significantly higher (26.8%) among Mexican-American adolescent boys than among non-Hispanic white adolescent boys (16.7%) in 2007-2008. Among girls in the

same time period, non-Hispanic black adolescents (29.2%) were more likely to be obese compared with non-Hispanic white adolescents (14.5%) (Ogden & CDC 2010).

In the first phase of the project well over half of the participants (62.5%) were Native Americans. The overall health status of American Indians continues to be poorer than that of the general population by most indications (Story et al 1999). Mortality related to behavioral or lifestyle factors have increased and chronic disease such as type II diabetes, heart disease, and cancer are among the leading cause of death among Native American adults. These chronic diseases are strongly associated with increasing prevalence of obesity in American Indians. There is a critical need for obesity-prevention programs targeted toward American Indian children (Story et al 1999).

Overweight has emerged as a major nutrition-related health issue affecting American Indian children as well as adults (Story et al 1998). Studies show that American Indian children have higher prevalence of overweight than do children from the general US population (Story et al 1998). Several dietary practices of American Indians are identified and include the use of butter, lard, whole milk, fry bread, fried meats and vegetables, and the general use of fats in the preparation of beans. In addition, there is a high consumption of sugary sweetened vegetables. The recent proliferation of fast-food restaurants and convenience food stores on or near reservations also encourages the consumption of high-fat, high-sugar foods and poverty limits the access to healthful foods (Story et al 1998). Type II diabetes mellitus was considered mostly an adult disease until recently, as an increase in

obesity has increased the diagnosis of type II diabetes mellitus in American Indian and other adolescents (Story 1998).

Role of diet and physical activity

Poor diet is a major contributor to obesity in the United States because of an abundance of foods low in nutrients but high in energy. Nutrition education plays an important role in obesity prevention strategies. One major implementation strategy is to increase the consumption of fruit and vegetables. School-based interventions to prevent obesity have successfully incorporated strategies that include increased fruit and vegetable consumption (Lowry 2008). Increasing fruit and vegetable intake in children's diet is one way to replace energy-dense, low nutrient diets (Demattia 2008). According to Lowry et al sufficient fruit and vegetable intake was independently associated with being physically active, eating a diet low in calories or fat and limited TV viewing. This study also suggests that interventions, which promote fruit and vegetable intake, may be more effective if they capitalize on the strong association between physical activity and fruit and vegetable intake.

Diet is not the only aspect of the obesity epidemic that should be considered when developing an intervention. There is convincing evidence that increased levels and frequency of physical activity are associated with decreased risk for obesity (Biro and Wien 2010). An effective intervention must tackle both diet and physical activity and integrate both (Lean 2006). Interventions should focus on enabling people to manage energy balance better in the current "obesigenic" environment

and changing the current sociopolitical environment that contributes to obesity (Lean 2006).

A combination of strategies is important for an effective intervention such as increasing physical activity and reducing total calories. Other examples include decreasing the prevalence of energy dense foods and reducing fat in the diet. Even small changes in behavior could prevent weight gain such as increased walking, decreased dietary fat, decreased sugar intake, and smaller portion sizes (Lean 2006). Regular exercise has the potential to improve many facets of physical and psychological health such as improvements of lipid profiles, increased fat-free mass and decreases in fat mass, improved oxidative capacity, increased resting metabolism, increased fat oxidations and improvements in insulin sensitivity (Bennett and Sothorn 2009). The obesity interventions that focus on physical activity from a literature review illustrated there was a remarkably high efficacy of physical activity in reducing obesity related measures and increasing overall physical fitness of school-aged subjects (Shaya 2008). Short-term interventions lasting less than 6 months in duration showed positive statistically significant results in reducing diastolic blood pressure, increasing physical activity incidence, and reducing triceps skin fold of study participants (Shaya 2008).

Preventing obesity is not just a matter of weight loss and maintenance but also preventing the onset of chronic disease. Methods of preventing chronic diseases include changing selected lifestyle behavior. Healthy children are better prepared to learn and educational accomplishments and aspirations are linked to health status

(Baranowski 2000). Deficiencies in a child's diet can impair cognitive functioning in general and school performance in particular (Baranowski 2000). Physical activity is related to positive mental health and emotional status. In its most severe form overweight can pose an immediate health risk for the child by stressing both the metabolic and the skeletal systems (Baranowski 2000).

Promoting Healthy Lifestyles: Obesity prevention strategies and programs- School based and non-school based

The need for a comprehensive approach to the treatment of obesity has been suggested in *The Surgeon General's Vision for a Healthy and Fit Nation 2010* and the 2010 Report of the White House Task Force on Childhood Obesity (MMWR 2010). The comprehensive approach should include multiple settings (such as medical-care sites, worksites, and communities) and many sectors (such as industry and government). There also needs to be a change in individual behaviors as well as policies and behaviors that contribute to an 'obesogenic' society (MMWR 2010). Environmental and policy support for physical activity and for nutrition are associated with increased physical activity and improved diet.

The strongest case for offering behavioral interventions in diet and physical activity to children and adolescents include the benefits for children's health, cognitive abilities, and emotional functioning (Baranowski 2000). Childhood obesity prevention should involve maintaining energy balance at a healthy weight while protecting overall health, growth, and development, and nutritional status (Koplan et al 2005). Recommendations for community-based programs involving child- and youth- centered community organizations should promote healthful eating

behaviors and regular physical activity through new and existing programs that will be sustained over the long term (Koplan et al 2005).

Obesity prevention strategies

Nutrition education interventions should encourage the consumption of certain food groups and limit the fat and sodium intake of children. Whole grain products, fruits, and vegetables should be encouraged to be consumed often along with 2-3 cups of fat-free or low-fat milk per day and lean protein (USDA dietary guidelines 2010). The consumption of calories in the liquid forms, especially soft drinks, should be discouraged. Nutrition education interventions should also include limiting portions sizes, frequency and type of snacking, restricting eating in front of the television or computer, and consuming nutrient dense rather than calorically dense foods (Bennett and Sothern 2009).

The Committee on Prevention of Obesity in Children and Youth encourages the evaluation of interventions that focus on preventing an increase in obesity prevalence, improving dietary behaviors, increasing physical activity levels, and reducing sedentary behaviors (Koplan et al 2005). Most research has been school-based and has been characterized by the delivery of nutrition education, promotion of decreased TV viewing and sedentary behavior with pamphlets and lectures, modification of the food offered by school cafeterias and the inclusion of physical activity programs (Gonzalez-Suarez et al 2009).

School based programs

The American Dietetic Association, School Nutrition Association, and Society for Nutrition Education have the position that comprehensive, integrated nutrition in schools are an essential component of coordinated school health programs (American Dietetic Association 2010). Teaching and promoting healthful eating is essential to address childhood health and education problems. There are many advantages for implementing obesity preventions in the school based setting. Students spend a good amount of time in school, which allows for many opportunities for interventions. Schools offer continuous, intensive contact with children during their formative years (Katz 2009). The most promising approach to prevention of obesity in teens and young adults is to encourage healthful eating and physical activity and promote healthy lifestyle changes (Agron 2002). The school-based interventions provide opportunities to prevent obesity by providing nutrition education to students while they are in the classroom.

The positive and negative effects of peer pressure are well documented and the development of a sensitive and inclusive intervention program is important (Shaya 2008). A program that includes peer progress, assessment through competition, peer-led education, or physical activity sessions may positively correlate to modification in dietary intake and/or physical activity participation (Shaya et al 2008). Food on the Run (FOR) is a high school based intervention program that has many components that promote healthful eating and physical activity among adolescents (Agron 2002). The mission of FOR was to increase healthful eating and physical activity among teens in order to improve their health

and reduce their risk of chronic disease (Agron 2002). This program was implemented during the course of the nine-month school year and included training student advocates to help teach and encourage other students to live healthy lifestyles. The FOR intervention demonstrates success in its school-based, student-driven nutrition and physical activity program (Agron 2002). Much of the success is likely due to the student advocate component of the program and the result of time spent on activities outside of the training.

The use of multi-component interventions has been associated with greater positive changes in health outcomes in adolescents (Kelly and Melnyk 2008). The use of behavioral modification skills in programs for the treatment of obesity in adolescence appears to be linked to better outcomes. In the study by Kelly and Melnyk, ages of participants ranged from 12 to 20 years and most of the interventions met weekly. The length of time or program intensity did not allow predicting the program success in that longer programs or more sessions did not increase the likelihood that the program achieved significant results. Teens, who perceived healthy lifestyles as more difficult, also had less healthy attitudes and reported less healthy choices and behaviors (Kelly and Melnyk 2008). Thus, including strong cognitive behavioral skill building component into the intervention with teens might be key in boosting their confidence about being able to engage in healthy behaviors (Kelly and Melnyk 2008).

The Pathways study was a school-based study for the prevention of obesity in American Indian schoolchildren (Caballero 2003). This study was designed to

evaluate the effectiveness of a school-based, multi-component obesity intervention in elementary school children. The Pathways study consisted of four components: classroom curriculum, food service, physical activity, and family involvement (Caballero 2003). The outcomes of the study were measured by using specific anthropometric data, body fat percentage, physical activity, dietary intake and a questionnaire about knowledge, attitudes, and behavior. The results of this study indicate that there were no statistically significant differences between the intervention and the control group in anthropometric variables. The intervention group did report having significantly lower total daily energy intake and energy from fat compared to the control. Knowledge increased significantly in the intervention group compared with the control (Caballero 2003),

Planet Health was an obesity intervention designed to provide students with cognitive and behavioral skills (Gortmaker 1999). These skills will in turn enable students to change behaviors, strengthen perceived competence in employing new behaviors effectively. This study focused on increasing physical activity, increasing energy expenditure, and reducing time spent watching television. Planet Health was specifically designed to reduce obesity among middle-school youth. Study results show success in reducing obesity among middle school girls. In addition, reductions were found in the student's television viewing time (Gortmaker 1999).

Worksite based prevention

Worksite health promotion refers to strategies that are designed to improve health-related behaviors and health outcomes of workers. Worksite nutrition and

physical activity programs may occur separately or as part of a comprehensive worksite health promotion program addressing a broader range of objectives. Intervention programs take place in settings that may have a consequence for their effectiveness (Anderson 2009), which indicates some setting may be more appropriate than other settings.

Behavior and obesity prevention

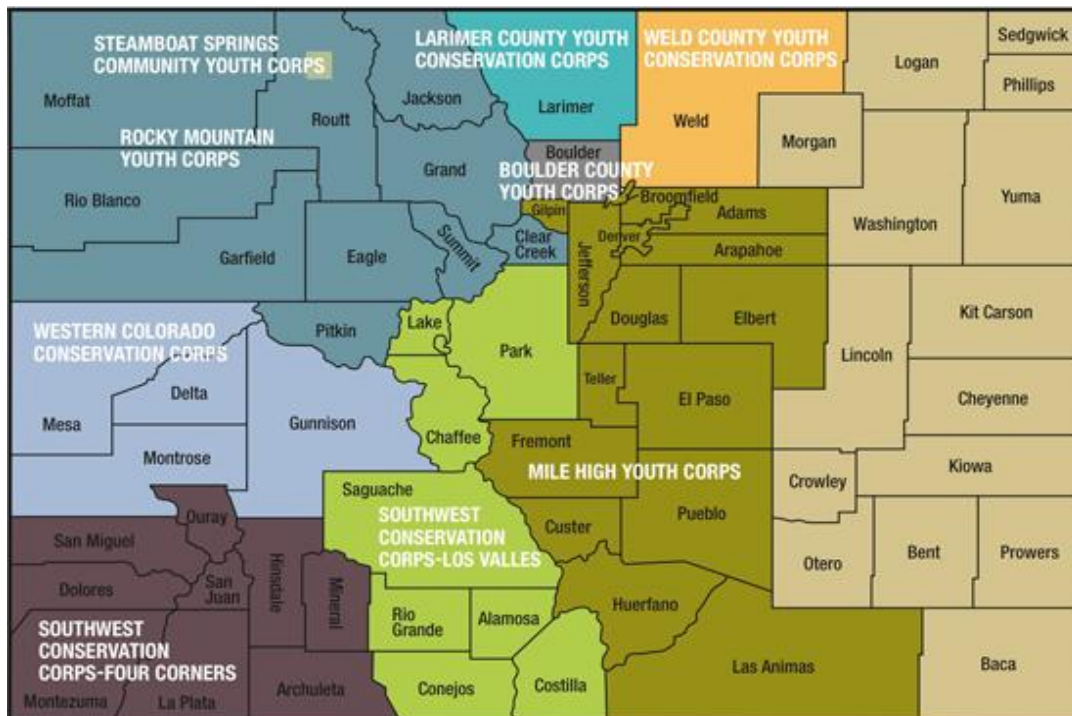
Experts at the American Dietetic Association analyzed literature related to behavior change theories and strategies used in nutrition counseling. The use of behavior change theories and models enables dietitians and nutritional educators to use proven strategies to enhance effectiveness when designing and implementing nutrition programs (Spahn 2010). The results from the analysis found that Cognitive Behavioral Therapy is beneficial in facilitating modification of targeted dietary habits (Spahn 2010). Cognitive behavior therapy is discussed further in chapter 3.

The behavior intervention component is important for the acquisition of knowledge and skills needed to promote healthy lifestyle choices in and out of school (Venditti 2009). An intervention targeted at reducing the risk factors for type 2 diabetes in adolescent focused on behavior change. Important aspects of this behavior intervention were behavior skills practice, using goal settings, and self-monitoring and problem solving (Venditti 2009). Key elements in this behavior change intervention included peer-led classroom interactions, multi-semester learning opportunities, training and practice of behavioral skills, and sustaining behavior change (Venditti 2009).

Nature of the youth corps: pertinent demographic information

The Colorado Youth Conservation Corps Association (CYCA) is a statewide coalition that employs and trains youth and young adults on land, water, and energy conservation projects. The Youth Conservation Corps is a proven strategy for engaging young people in community service projects and stewardship of their environment while preparing them with valuable skills to meet the challenges of the 21st century (Colorado Youth Corps Association 2010). The goal of CYCA is to teach job and leadership skills and the youth learn about such life skills as money-management, independent living, and organization. The goal of the *Healthy Lifestyle Curriculum for Youth Corps Members* is to teach the youth about the importance of living a healthy lifestyle. CYCA is divided into several youth conservation corps as shown in a map (figure 2.1) provided on their website (cyca.org/join).

Figure 2.1



CYCA employs and trains youth who are typically between the ages of 14-25 years. Many of these youth are low-income, at-risk, and/or ethnic minorities. There are currently 10 accredited youth corps in the state that served 1,232 corps members in 2009 (CYCA 2010). Day crews go out to work in the field and return home each night, whereas overnight crews remain in the field for up to a week at a time. In Colorado 89% of the corps members are Colorado residents while 15% claim residency in another state.

Some of the youth are from special populations such as veterans and some are children of foster care. In 2009, 6% of the youth employed by CYCA were veterans. Five percent of the Western Conservation Corps members were in foster care while 7% of the Mile High Youth Corps (MHYC) was in foster care. Weld County Youth Conservation Corps had 20% of corps members from foster care and 50% of their participants were court ordered as part of a special program.

In 2009, 50% were between the ages of 14-18 years, 35% were between the ages of 19-25 years, and 7% were over the age of 26. The primary ethnicity of the participants in 2009 was white/Caucasian. Table 2.1 breaks down the percent of participants by ethnicity. In 2009, 62% of the corps members were male and 38% were female.

Table 2.1 Ethnicity of Corps members in 2009

Ethnicity	Percent of total corps members
American Indian/Alaskan	5%
Asian	3%
Black/African-American	8%
Native Hawaiian/Pacific Islander	2%
White/Caucasian	54%
Hispanic/Latino	28%

Over half of the CYCA members had no prior work experience before joining (60%), while 28% had 2-3 jobs prior to joining the youth corps and 14% had more than four jobs. In 2009, the highest percentages of corps members were in high school (35%), while 18% had a high school diploma, 24% were studying to get their GED, and 27% had received a GED. Some of the corps members were currently enrolled in college or had taken some college courses (23%) and 10% had either a bachelor of arts or a bachelor of science. Only about 2% of participants had been to a trade school and 3% of participants were attending or had finished graduate school.

It also important to note that in 2009, 86% of participants completed the program while 14% quit or did not complete the full term.

Phase One

A previous graduate student, Molly White, worked on the first phase of this project. The first phase of the program included the following elements: 1) assessing the needs of the target audience; 2) developing the *Healthy Lifestyles* curriculum and instructors guide; 3) training of instructors; and 4) assessment of the qualitative

measures including feasibility and acceptability of the pilot program according to participants and instructors (White 2009).

Subject Selection and Needs Assessment

For the first phase of the project, the participants were recruited from three Youth Conservation Corps in Colorado. The Youth Corps consisted of Weld County Youth Conservation Corps (WCYCC), Western Colorado Conservation Corps (WCC), and Southwest Conservation Corps (SWCC)- Four Corners. Two crews were randomly selected from each of these corps to participate and each crew consisted of 1-2 crew leaders and approximately 8-10 corps members. The ages of the youth were between 14-25 years and both males and females were recruited. Consent forms were required to participate. The Colorado State University Institutional Review Board approved the research for both phases of the project (see appendix A for Institutional Review Board letter of approval).

A needs assessment was conducted to guide program development and to determine feasibility of implementing a healthy lifestyle program with members of the Youth Conservation Corps in Colorado. A group discussion was conducted with recruited members representing each of the participating youth corps. A single one-hour session led by a researcher from Colorado State University was conducted at each of the participating youth corps. The researcher played the role of facilitator by asking questions, initiating discussion, encouraging participation from all in attendance, and probing for details. Two other staff members were present to distribute themselves amongst the participants and record all observations and

responses from participants. The purpose of the group discussions was to narrow the focus of the topics that would be discussed in the curriculum and to determine the feasibility of implementing a nutrition and physical activity-based curriculum with the target audience. The results of the group discussion at each location were compiled and then analyzed to determine common themes as well as feasibility of implementing a healthy lifestyle curriculum with this audience.

Design of the Curriculum

The results of the group discussion were combined with feedback from youth conservation corps staff members and CYCA staff members. Based on staff feedback regarding crew schedules, the *Healthy Lifestyles* curriculum was designed with eight lessons, or one lesson per week (these lessons were later changed to units in the second phase of this project). Based upon feedback from staff members each of the eight lessons was designed to be around 30 minutes in duration. The curriculum was also designed to be flexible and easily adapted to the varying routines of each crew. The needs assessment was used to determine the topics that would be covered in the curriculum with the exception of the food safety lesson and the health insurance section, which was added by CYCA staff. The eight original lesson topics from phase one included in the pilot program were:

1. *Lesson 1: Importance of a Healthy Lifestyle*
2. *Lesson 2: Tools for Success: Reading Food Labels and Ingredient Lists*
3. *Lesson 3: How to Avoid Marketing Traps*
4. *Lesson 4: Eat Smart! Making Healthful Choices On-The-Go*
5. *Lesson 5: Eat Well for Less*

6. *Lesson 6: Healthful Meals Quick!*

7. *Lesson 7: Keep Your Food Safe*

8. *Lesson 8: Keep it Up!*

For the first phase of the project following curriculum completion, participants were provided with educational enhancers intended to enable and encourage participants to practice safe food handling. The materials included color-coded cutting boards, cooking thermometers and refrigerator magnets showing proper cooking temperatures. Due to issues with funding these educational materials were not provided in the second phase of the project.

Theoretical Framework

The Social Cognitive Theory was used as a basis for the theoretical framework of each lesson. The Social Cognitive Theory (SCT) was developed by Bandura to analyze and understand human thought, motivation, and action (Contento 2007). Social Cognitive Theory is based on the notion of ‘reciprocal determinism’, in which personal, behavioral, and environmental factors work in a dynamic and reciprocal fashion to influence health behavior. With each of these factors are a number of constructs that are used to predict and explain the outcome. For individual or personal factors, constructs include outcome expectations, outcome expectancies and self-efficacy (Contento 2007). Constructs for behavioral factors include knowledge and skills, self-regulation, and goal setting. Constructs of environmental factors include observational learning (Contento 2007). The constructs of this theory used in developing the *Healthy Lifestyles* curriculum

applied to all three of these factors and included reinforcement, outcome expectancies, self-regulation, self-efficacy and observational learning.

The curriculum was designed to increase outcome expectancies by ensuring that participants viewed the lesson topics and activities as valuable. The needs assessment in the first phase of the project provided valuable information related to topics of interest to this population. The curriculum contained multiple forms of reinforcements such as supplemental activities and a summary of the lesson to encourage acceptance and implementation of the desired behaviors. Self-efficacy is an important construct of the Social Cognitive Theory and was addressed by encouraging youth corps member to make small changes over time and set goals. Goal setting involves the selection of modifiable behaviors that are to be targeted by interventions and selecting specific short- and long-term benchmarks by which progress can be evaluated (Bennett and Sothern 2009). Table 2.2 represents the constructs of the theory and the applications.

Table 2.2

Theory Constructs	Application
Outcome Expectancies	Design activities to increase the value they place on the outcomes of having a healthful diet and being physically active <i>Accomplished via supplemental activities</i>
Reinforcement	Provide external reinforcement in the form of rewards to encourage corps members to adopt desired behaviors. The use of the supplemental activities to reinforce the important point of each unit. <i>Accomplished via supplemental activities, fill in the blank sections, trivia review section</i>
Self-Regulation	To aid in the development of skills related to regulating corps member’s behaviors and actions <i>Accomplished via providing opportunities for problem solving (plate method, meal design, serving sizes, food safety quiz etc) and encouraging goal setting (use of MyPyramid recommendations and reflections and goals section at the end of each unit).</i>
Observational Learning	Provide opportunities for vicarious learning through the use of “modeling” positive behaviors for corps members. Provide opportunities for corps members to practice what they have learned in each unit. <i>Accomplished via supplemental activities, group discussion, and format of each unit (question and answer sessions).</i>
Self-efficacy	Instill confidence in performing desired behaviors. Focus on making small changes over time. Use constructive feedback and encouragement. <i>Accomplished via demonstrations (reading food labels, MyPyramid charts, etc), Group discussion format which builds confidence through answering questions.</i>

Instructor Guide

An instructor guide was developed for the crew leaders as a way to ensure consistency of teaching across all crews. It was assumed that there would be some level of variation in the background knowledge about nutrition and physical activity among crew leaders so the instructor's guide was designed to give background knowledge of the topics of each lesson. Additionally, the original instructor's guide included information of the program development, instructions for teaching the lessons, an explanation of the theoretical framework and lesson structure, and a sample lesson tutorial. Upon the conclusion of each lesson (unit), there was an instructor's notes page, which asked a series of open-ended questions related to program acceptability and encouraged general comments and suggestions for feedback from the crew leaders. There was an appendix within the guide, which contained a list of materials for each lesson and activity, a glossary, and related references.

Training

There was an in-person crew leader training led by a researcher from Colorado State University (CSU) at the participating youth corps location. The training lasted two hours and instructor's guides and materials were distributed and reviewed. The training for phase one included covering topics in the curriculum, how to identify 'teachable moments,' an explanation of the components and layout of each lesson, the theoretical framework used, how and when to implement the supplemental activities, and the purpose of the instructor's notes pages following each lesson. Additional emphasis was placed on the instructor's notes pages in

providing quality feedback. Questions were encouraged from the crew leaders throughout the training session.

There was one crew leader training prior to the implementation of the curriculum in phase one. The training that took place at South West Youth Conservation Corps (SWCC) was scheduled by corps member staff and set for a time when crew leaders had just arrived back from a week-long field trip. The crew leaders were hungry, tired, distracted, and expressed little interest in participating in the training or in teaching the curriculum

Data Collection

The focus of the first phase of the project was to assess the qualitative feedback regarding feasibility and acceptability of the pilot program. The data used was derived from multiple sources including youth conservation corps members, crew leaders, staff members of CYCA, and youth conservation corps staff. Corps members were asked to complete a pre- and post- survey before and after the eight lessons. Corps staff members were responsible for distributing and collecting both the consent forms and the pre- and post- survey.

Analysis of the data was performed using SPSS version 17.0.2. Independent samples t-tests were used for comparison between youth conservation corps, between day and overnight corps members, and between ethnicity. Descriptive statistics were used to analyze participants responses related to the acceptability of the *Healthy Lifestyles* pilot program.

Results

Two of the three youth conservation corps participated in the pilot phase of the *Healthy Lifestyles for Youth Corps Members*. Weld County Conservation Corps was excluded due to drastic behavioral and lifestyle differences and most of the basic needs of these individual was not being met. Western Youth Conservation Corps (WCCC) in Grand Junction, CO and SWCC - Four Corners in Durango, CO were the two participating corps. The data represents the eight conservations corps members from SWCC and five from WCCC who returned signed consent forms, participated in the eight-week pilot program, and completed the qualitative portion of the post survey. In the pilot program, the average overall age of participants was approximately 18 years of age, with a range of 16-22 years. There were 13 participants in the pilot program.

Program acceptability was measured from corps member and crew leader feedback. Responses from corps members regarding program acceptability were divided into two categories: acceptability of the overall program and acceptability of each individual lesson. Corps members were asked to rate the overall program on a likert scale of one to five (1= 'did not like it at all'; 5='Like all of it'). The results from WCCC suggest that program acceptability was positive (80% of participants rated the program as a 3 or 4 out of 5), while half of the SCC rated the program as a 3. The mean overall rating of the program was similar between the two youth conservation corps with the means for SWCC and WCCC of 3.0 and 2.8, respectively. Difference

between crew (day or overnight) and ethnicity were not statistically significant. When comparing each of the eight lessons individually there was no statistically significant difference in acceptability of any of the eight lessons between SWC and WCCC.

Crew leader feedback from the instructor's note pages after each lesson was also used to assess the acceptability of the program. The results from phase one provided the data for the refinement and development of the curriculum to be used in phase two.

Summary

While it appears the obesity epidemic is continuing to grow there are significant efforts being made to defeat it. However, in the quest to defeat the obesity epidemic certain populations may not be getting the help they need and may not benefit from these efforts. Individuals employed by the Youth Corps may be examples of such a population and there are several examples that could justify the need for a healthy lifestyle intervention with this population. First, the age of the individuals employed by Youth Corps (14-25) is an optimal age for primary intervention. In addition, adolescents employed by the Youth Corps may not have benefited from school-based interventions because either they did not finish school or they were not exposed to school-based interventions during their childhood. According to CYCA, many of the youth employed by the Youth Corps either are ethnic minorities or come from families of low socioeconomic status which places them at further risk to become obese. The *Healthy Lifestyle Curriculum for Youth*

Corps Members was developed based on the needs of this population. The first phase of the project has already been described. The second phase of the study involved implementing and evaluating the effectiveness of the curriculum.

CHAPTER 3

METHODS

Obesity is a growing problem in this country among people of all ethnicities, which indicates a need for a healthy lifestyles program that educates and encourages behaviors in youth and young adults that contribute to a healthy lifestyle. The *Healthy Lifestyles for Youth Corps Members* program is the second phase of a multi-phase project. For the purpose of this project, the terms ‘instructor’ and ‘participant’ were used interchangeably with crew leaders and corps members, respectively. The first phase of the project is described in chapter 2, which includes a brief description of the first phase and an explanation of the theoretical framework used for this project.

Phase 2

The second phase of the *Healthy Lifestyles for Youth Corps Members* program was part of a multiphase project which was comprised of the following elements: 1) revising the curriculum by using the results from the feasibility and acceptability of the program from the first phase and applying the revisions to the second phase of the project; 2) developing a corps member guide that went along with the instructor guide; 3) accessing the validity and reliability of the survey; 4) recruitment of subjects and training the crew leaders on how to implement the curriculum; 5)

assessing the success of the program using quantitative measures including repeated measures analysis.

Revising the curriculum

The original curriculum was designed with eight lessons based on feedback from CYCA staff regarding crew schedules, which allowed one unit to be taught each week. Each of the eight original lessons (units) was designed to be between 20-30 minutes in duration and the corps staff had expressed the need for a flexible curriculum that could be easily adapted to the varying routines of each crew. Using the results from the first phase of the project, and the suggestions for change made by the research in phase one, the curriculum was reformatted and several changes were made to the instructor's guide. The following changes were made following the pilot program or first phase of the project:

Unit 1 Importance of a Healthy Lifestyle (Lesson 1): An activity was added to unit one that incorporates what the participants learned from MyPyramid. The idea for the activity was to make a healthy meal plan for a day when they are no longer participating in the youth corps. In addition, there was a suggestion to include more information on physical activity, although physical activity was not viewed as important in the original needs assessment from the first phase of this project. The second phase of the project focused on creative and fun ways to increase physical activity.

Unit 2 Tools for Success: Reading Food Labels and Ingredient Lists (Lesson 2): More information was included on whole wheat/whole grain. In addition, more information was included about vitamins and minerals.

Unit 3 How to Avoid Marketing Traps (Lesson 3): Additional information about energy drinks was included by adding energy drink labels to the food label activity.

Unit 4 Eat Smart! Making Healthful Choices When You're On-the-Go (Lesson 4): The activities in this lesson were made easier for overnight crews by offering suggestions for ways to use what is on hand for the activities such as using rocks and mud for the mud burger activity.

Unit 5 Eat Well For Less (Lesson 5): This lesson was designed to be more useable for those who do not shop for themselves.

Unit 6 Healthful Meals, Quick! (Lesson 6): There was a menu and meal shopping activity added to this unit.

Unit 7 Keeping Your Food Safe (lesson 7): The crews stated that they were already learning this material during the summer with the youth corps. Thus, another activity to relate this lesson more personally to the corps members was deemed necessary.

Unit 8 Access to Health Insurance (Lesson 8): The health insurance portion was formatted as part of the curriculum and replaced lesson eight, which was formerly a review lesson. There was a decision to take out the last lesson (lesson 8 of the original curriculum) and put the health insurance portion there and have an

optional review section. This was done because in the pilot program the health insurance was separate and not included as a unit, however CYCA wanted to include the health insurance as a unit, which meant one unit had to be eliminated.

It was suggested that the lessons (units) should be modified to make the curriculum more applicable for participants who are not responsible for food shopping and preparation. There was an addition of activities such as the food safety quiz and menu planning activity to the curriculum, which encouraged participants to participate in the shopping and cooking even when they live at home. Lessons were changed to units in order to make the curriculum seem less like a class and more like an interactive learning experience. The eight unit topics in the curriculum included:

1. *Unit 1: Importance of a Healthy Lifestyle*
2. *Unit 2: Tools for Success: Reading Food Labels and Ingredient Lists*
3. *Unit 3: How to Avoid Marketing Traps*
4. *Unit 4: Eat Smart! Making Healthful Choices On-The-Go*
5. *Unit 5: Eat Well for Less*
6. *Unit 6: Healthful Meals, Quick!*
7. *Unit 7: Keep your Food Safe*
8. *Unit 8: Health Insurance*
9. *Trivia Game (a supplement to the units which was added to replace the original lesson 8 which was a review of the previous units).*

After several conference calls between CYCA staff members and researchers at Colorado State University regarding suggestions for the revisions and reformatting of the curriculum there was a decision to develop a separate *Corps Member Guide* that goes along with the *Crew Leader Guide*. This would give the corps members something to take home with them upon completion of the curriculum. This guide was designed using the original curriculum but was reformatted to be interactive. This was not part of the original suggestions for change from the first phase of the project. Researchers at Colorado State University referred to similar curriculum that used both an instructor guide and a participant piece. The CYCA did an internal needs assessment to determine if the corps members would indeed want to keep a *Corps Member Guide*. They determined that a *Corps Member Guide* would be valuable, but it must not be bulky or difficult to carry because the overnight crew would need to fit them easily in a backpack without taking up too much room.

Development of the Corps Member Guide

The Corps Member Guide was adapted from the Crew leader Guide by copying and pasting the contents from the Crew Leader Guide into a separate document. In the corps member guide the wording was changed to reflect the corps member's point of view. The introduction was changed to address the corps member and give background information about the unit and the material that would be covered in the unit. The content was made to be more interactive by keeping the sections after each question blank in order for corps members to write in the answers. In the final copy of the Corps Member Guide, there were also several

fill in the blank sections, which were intended to keep the guide interactive. After each unit, there was a reflection and goals section in the Corps Member Guide, which was intended to provide the corps members an opportunity to internalize the material and write down goals (*Appendix B* contains a copy of the Corps Member Guide reflection and goals section of the curriculum).

In the original pilot program, following curriculum completion, participants were provided with educational enhancers to encourage participants to practice safe food handling which was the focus of the *Keep you Foods Safe* unit. Due to budget restrictions during the second phase the participants were not given the educational enhancers. Instead, they received a copy of the corps member guide, which they were able to take home with them after the completion of the program.

The final components of the *Crew Leader Guide* and *Corps Member Guide* include all changes made to the curriculum. These changes were determined through a series of conference calls, e-mails, and personal meetings involving the Colorado Youth Corps Association (CYCA) and Colorado State University (CSU). The format and appearance of the Crew Leader Guide, Corps member Guide, and materials were also determined through these conference calls, meetings and e-mails. (*Appendix C* contains sample pages from the Crew Leader Guide). The Crew Leader Guide was reformatted so that the crew leaders could have an in depth guide for teaching the curriculum on the left side of the page and a copy of the Corps Member Guide on the right side. This allowed the crew leaders to use the crew Leader Guide to teach the curriculum but they were also being able to visualize the

Corps Member Guide. This would allow the crew leaders to know when they needed to prompt the corps members to either answer a question or fill in blank spaces.

It was determined that both the Crew Leader Guide and the Corps Member Guide should be small to carry with them in the backcountry. Both the Crew Leader and Corps Member Guide were 8.5x5.5 inches in size with a font size of eight. The original curriculum was bound in a small binder, however it was determined that this was bulky. For phase two, both the Crew Leader Guide and the Corps Member Guide were spiral bound and had a clear plastic cover to provide protection from the elements. This change assured that both the Crew Leader and Corps Member Guide were less bulky and easy to pack into the backcountry for overnight crews.

Assessing the validity and reliability of the survey

To assess the validity and reliability of the survey, 25 corps members participating in various Colorado Youth Corps across Colorado were randomly selected. The selected corps members were asked to fill out the pre survey. Two weeks later the same participants were asked to take the post survey. The pre and post survey were identical. The pre and post surveys were matched and SPSS version 18.0 was used to determine validity and reliability. The survey used in the implementation of the curriculum was reviewed by professors and graduate students at CSU to determine face and content validity. Validity was measured to assess whether the survey measures what is it intended to measure. Reliability of the survey measures the consistency of a result on repeated trials. The reliability of the survey was determined by seeing how many corps members chose the same

answer for time one (pre-survey) and two weeks later for time two (post-survey). If the corps members were consistent with their answers then the survey question was determined to be reliable. The results indicated that only a few changes to the survey were necessary. These changes included clarifying question 7 (MyPyramid) and question 10 (healthy cooking method) by changing the format of 'not' to NOT. Changes in formatting to questions were also made for clarification. For instance in question 8 the question was shortened. Open ended questions pertaining to fruit and vegetable intakes were changed to include a range of answers from 1-5 servings. The question regarding fruits and vegetable intakes were separated into two distinct questions. Another change to the survey included formatting the survey by the youth corps to be more easily read by corps members. The demographic information was moved to the first portion of the survey so the survey would be in order of demographic information first, questions pertaining to attitudes second, knowledge questions, and on post survey questions pertaining to acceptability of the program. There were two additional questions regarding health insurance added by the Colorado Youth Corps Association.

Subject Recruitment and Selection

The CYCA was responsible for the selection of the participants. CYCA randomly selected members of the implementation group and the control group. Participants were recruited from Western Colorado Conservation Corps (WCCC), Mile High Youth Corps (MHYC), Larimer County Youth Conservation Corps (LCYCC), Southwest Conservation Corps- Four Corners (SCC-Four Corners), and Southwest Conservation Corps-Los Valles (SCC-LV). Crews were randomly assigned by the

Colorado Youth Corps Association to either a control or an implementation group. Crews were randomly assigned by putting the assigned crews by location into a hat and picking out the crew locations one at a time. For instance the first crew was assigned to implementation and the next would be assigned to control and so on. The implementation group consisted of those crews that were selected to participate in the *Healthy Lifestyles* curriculum. The control groups would be like the implementation groups in every way except they would not be participating in the *Healthy Lifestyles* curriculum. Both groups were given a survey at the beginning of their 8 week participation on the youth corps and a post survey after the completing the 8 weeks. The surveys were intended to measure the knowledge, attitudes and behaviors related to a healthy lifestyles curriculum. In order to be eligible for participation, individuals were required to be employed by the above participating youth corps. Both males and females were eligible to participate. There were 58 participants in the implementation group and 42 in the control group. There were no other exclusion criteria for this research. The Colorado State University Institutional Review Board approved the research (*Appendix A*).

Training

There were two in-person crew leader trainings led by a researcher from Colorado State University and an employee of CYCA. The crew leader training was conducted prior to implementation of the *Healthy Lifestyles* curriculum at two locations. The first location was in Durango, Colorado and the second was at the training in Golden, Colorado. The training was planned for four hours and during

this time the instructor guides and materials were distributed and reviewed. The researcher from Colorado State University explained the purpose and intention behind the design of the curriculum. A member of the Colorado Youth Corps Association explained the idea behind creating a *Healthy Lifestyles Curriculum* for youth corps members and the research behind the curriculum and original pilot study. The importance of research integrity was also discussed. Topics that were covered in the training included the theoretical framework used in developing the units; an explanation of unit outline and layout; how to identify teachable moments; different teaching strategies; how to implement supplemental activities; and the purpose of instructors' notes following each lesson. The Corps Member Guide was also introduced and there was an explanation of the purpose, intention, and use of the Guide. The crew leaders were asked to look at both the Crew Leader Guide and Corps Member Guide during the training. The researcher and member of CYCA also emphasized the importance of the survey for both the implementation and control groups and research design. The Colorado State researcher went through an overview of MyPyramid and the basis of living a healthy lifestyle before going more in depth into each unit. The training was designed to be interactive and the crew leaders were encouraged to ask questions and participate.

It was important to ensure there was enough time to conduct the training and the location of the training was in a quiet, private place. During the pilot program, the researchers had issues with the training because the crew leaders had just come back from a day in the field and were hungry and tired. The researcher experienced frustration when the crew leaders were not able to focus on the

training and were distracted. For this phase of the program there was emphasis placed on the time, length, and where the training would take place to ensure the crew leaders would be able to pay full attention to the trainers. Each of the phase two trainings took place after lunch in a private room and there was 4 hours of time designated to teach the curriculum, however neither of the two trainings took all of the four hours to complete.

During the first training in Durango the units were introduced and the plans for teaching the curriculum were explained. The crew leaders were given a sheet that explained different teaching methods and the crew leaders were asked to pick a teaching method and section from each of the eight units to teach back to the CSU researcher, member of CYCA, and fellow crew leaders. This provided crew leaders with the self-efficacy and confidence to teach the curriculum and think of creative ways to effectively teach the curriculum. When the training was finished the crew leaders were asked to give feedback, which would be used to make changes for the final training in Golden, Colorado.

The second training in Golden went much the same as the first training except for a few changes made from suggestions from the first training. The overview of the purpose of the curriculum and research were the same. The review of MyPyramid was more interactive and the researcher went through each food group and had the crew leaders give examples of foods and in which food groups they belonged. The importance of physical activity was also emphasized and crew leaders were asked to give examples of their favorite physical activity. The

researcher provided an overview of unit structure and a member of CYCA gave examples of teaching styles. The crew leaders were then asked to split up in groups of two and were given a unit to cover. They were given 20 minutes to pick a section of the curriculum to teach and a teaching style in which to teach the curriculum. The crew leaders then presented the unit to the entire group. This was much the same as the first training except they were encouraged not to teach from the book and to be creative with their teaching style to engage participants.

Data Collection

The focus of this phase of the project was to assess quantitative feedback regarding the effectiveness of the program. The survey was developed during the first phase of the project. As discussed previously the reliability and validity of this survey was measured. A few changes were made to the survey to ensure reliability. The survey was used as a tool to measure knowledge, behavior and attitudes towards healthy lifestyles. Corps members were asked to complete the pre and post survey before and after the series of lessons respectively. The post- survey contained an addendum with questions used for assessing acceptability (See *appendix E to see the addendum*).

Corps staff members were responsible for distributing and collecting both the consent forms and the surveys from corps members. Once the signed consent forms had been collected, the pre-survey was distributed and collected by corps staff. Staff members were instructed on how to maintain confidentiality of the surveys through the use of approved three-digit codes (for example: WCC001; WCC

representing Western Colorado Conservation Corps). Following the eight week curriculum, the corps staff members were responsible for distributing and collecting and post-survey in the same fashion. Consent forms and surveys were then mailed directly to Colorado State University, where they were analyzed and kept on file.

Qualitative feedback from crew leaders was gathered from the instructor's notes page following each of the eight units in the curriculum. The instructor's notes page contained several open-ended questions designed to further assess program acceptability much like the first phase of the program. The instructor's notes also gave crew leaders an opportunity to provide comments and suggestions. Qualitative feedback was also gathered from the corps members who completed the curriculum. The post-survey had an addendum similar to that used in the pilot program to assess the acceptability of the program.

Data Analysis

The data analysis was performed using SPSS version 18.0. Repeated measures analysis in the form of a two-way analysis of variance (ANOVA) and paired sample t-test were used for comparing the two groups, control and implementation. After comparing the two groups data was also analyzed comparing the differences between gender, age and ethnicity. Descriptive statistics were used to analyze participant responses related to the question regarding health insurance and the question regarding where the participants purchased food. Questions pertaining to the over acceptability of the *Healthy Lifestyles* program were analyzed

using descriptive statistics and two-way ANOVA. Paired sample t-tests were used to analyze the implementation group and control group separately as well as a measure to compare the results from the two-way ANOVA.

CHAPTER 4

RESULTS

The Colorado Youth Corps Association was responsible for the selection of the participants. CYCA randomly selected members of the implementation group and the control group. All participating members of the youth corps were required to fill out a consent form and only those who completed both the pre- and post-survey would be included in the data analysis. All of the participating corps selected were included in the final phase of the *Healthy Lifestyles for Youth Corps Members*, however not all of the corps members completed the program. There were approximately 19 corps members who did not complete the season/pilot and therefore post surveys were not provided. The Larimer County Youth Conservation Corp's implementation crew only completed units 1-5. From Western Colorado Conservation Corps (WCCC) there were a total of 17 corps members who participated in the implementation group and 18 in the control group. For the Mile High Youth Conservation Corps (MHYC) there were 15 total participants in the implementation group and 5 in the control group. Larimer County Youth Conservation Corps (LCYCC) had eight participants in the implementation group and zero in the control group. Southwest Conservation Corps- Four Corners (SCC-FC) had five total participants in the implementation group and seven in the control

group and Southwest Conservation Corps- Las Valles (SCC-LV) had 15 total in the implementation group and 14 in the control. Fifty-eight participants in the control completed consent forms and both pre- and post- surveys. In the control group, 42 participants completed consent forms and both pre- and post- survey. Of the 58 Participants in the implementation group there were 38 in the overnight and 20 in a day crew. All of the participants in the control group were on overnight crews. After the initial data from all participating corps members was analyzed and was determined to be 20 years, the data was re-analyzed to include only corps members ages 20 years and under. The decision to re-analyze the data with ages 20 years and under was made after the original data indicated the average age of the corps members were higher than predicted values from previous years. The curriculum was designed for youth and young adults between the ages of 14-19 because it was determined that the majority of corps members were within this age group.

Characteristics of Participants (Corps Members)

The average age of participants in the control group was 20 with the minimum age of 17 and maximum age of 29 years. The average age of participants in the implementation group was 19.37 years with the minimum age of 17 years and maximum age of 26 years. Table 1 shows the demographic information for the implementation and control group. In 2009, 50% of participants in the Colorado Youth Conservation corps were 14-18 years and only 35% were 19-25 years. In 2009, only 54% of the participants were white compared to the population in this study where 83% of the participants were white. Table 4.2 shows the average age for each of the participating youth corps. This is important because when analyzing

for acceptability of the program the younger crew generally rated the curriculum as more acceptable.

Table 4.1 Demographic Information

	Implementation	Control
Male	37 (60%)	27 (65%)
Female	23 (40%)	15 (35%)
White	52 (92%)	35 (83%)
American Indian	0 (0%)	1 (3%)
Asian	1 (2%)	0 (0%)
African American	1 (2%)	1 (2%)
Hispanic	1 (2%)	0 (0%)
Mixed	0 (0%)	3 (7%)
Other	1 (2%)	1 (3%)

Table 4.2 Average Age of Youth Corps Members by Crew

Implementation Group	Average age
Southwest Conservations Corps-Las Valles	20.2
Larimer Country Youth Conservation Corps	17.5
Mile High Youth Conservation Corps-day crew	17.4
Mile High Youth Conservation Corps-Overnight	19
Western Colorado Conservation Corps- Overnight	21.5
Western Colorado Conservation Corps-day crew	20
Southwest Conservation Corps- Four Corners	22.2

The majority of the participants received health insurance through their parents (74% of the control group and 64% of the implementation group). While there were some participants who purchased their own health insurance, there were approximately 20% of participants in both the control group and implementation group who were not currently enrolled in a health insurance plan.

When asked where they purchased most of their food about 90% of both the control group and the same amount in the implementation group said they purchased food from the grocery store. While a few participants received food from

a food bank about 6% got most of their food from restaurant/take-out/delivery/fast food. The control group and implementation group were similar in where they purchased most of their food.

The purpose of the second phase of this project was to measure knowledge, attitude and behavior changes relating to the implementation of the *Healthy Lifestyles* curriculum.

Results for Changes in Attitudes and Behavior from Pre- and Post-Survey

When asked how often they ate fast food the majority of the participants never ate fast food or did not eat fast food very often. In addition, there was a slight difference (although not significant) in how the participants answered the question between pre and post survey for both implementation and control as seen in table 4.3.

Table 4.3 Pre- and Post- Survey Responses* of Control and Implementation Group

	Control n=42		Implementation n=58	
	Pre-Survey	Post-Survey	Pre-Survey	Post-Survey
I never eat fast food	26	28	43	45
Not very often	10	8	11	8
Sometimes	4	4	5	5
Always	2	2	1	1

***Question 3: When you eat fast food, how often do you “supersize’ your meal?**

When asked how many meals are prepared outside of the house there is a time effect (between pre- and post- survey) on behavior. The control group increased a significant amount between pre- and post- survey. There were no significant differences between gender and age when comparing pre- and post- survey. The number of fruit or vegetable servings the corps members reported

eating per day did not differ between pre- and post- survey in either group as seen in table 4.4. When the data was re-analyzed using only corps members 20 years and under the results were not significant. *(For complete results on behavior questions for ages 20 and under, please refer to appendix F).*

Table 4.4 Within Subjects Contrast: Difference in Group Behavior Score between Pre and Post survey

	Meals outside of home	Servings of Fruit	Serving of Vegetables
Group time effect	.023*	.250	.850
Gender time effect	.123	.151	.176
Age time effect	.459	.539	.382

*There was a significant decrease in control group participants for number of meals prepared outside of the home between the pre and post survey as seen in figure 4.1.

The control group and the implementation group were different in their pre- and post- survey responses for the question regarding how many meals are prepared outside of the home. The control group decreased the number of meals prepared outside of the home more than the implementation group between pre- and post- surveys as seen in Table 4.5. There were no differences in the number of fruit serving and vegetable servings between the control group and implement group. There was a slight age effect on fruit servings when comparing the two groups and a slight gender effect on the serving of vegetables between groups. When the data for corps members over the age of 20 were not included, there was no significant difference; however, the significance for meals prepared outside of the home was .001. *(For complete results on behavior questions for ages 20 years and under please refer to appendix F).*

Table 4.5 Subjects Contrast: Difference in Behavior Score Between Control Group and Implementation Group

	Meals outside of home	Serving of Fruit	Serving of Vegetables
Group effect	.014*	.331	.248
Gender effect	.551	.752	.039**
Age effect	.688	.033	.164

*There was a significant difference between the control and implementation group for this question

**There was a significant difference for gender between the two groups

In figure 4.1, there is a slight decrease in the number of meals prepared outside of the home. The control group had the greatest decrease but it was not a significant difference. It was significantly different from the implementation group.

Figure 4.1

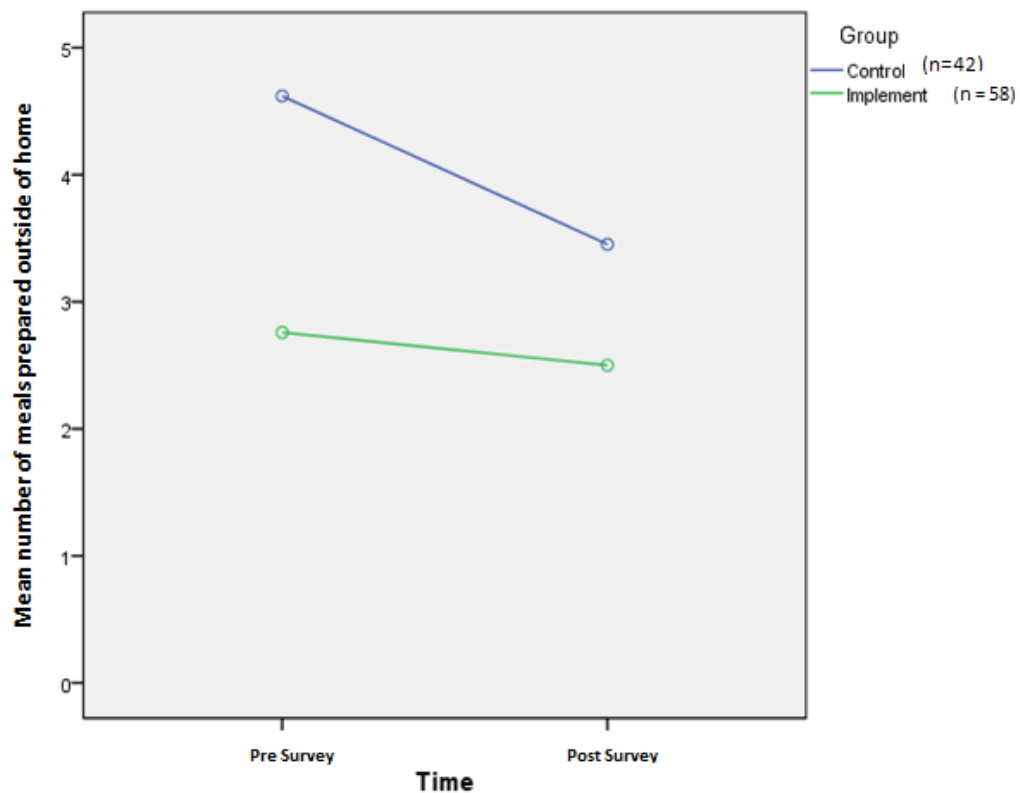


Figure 4.1 Difference in Mean Number of Meals Prepared Outside of the Home per Week between the Implementation and Control Groups

Figure 4.2

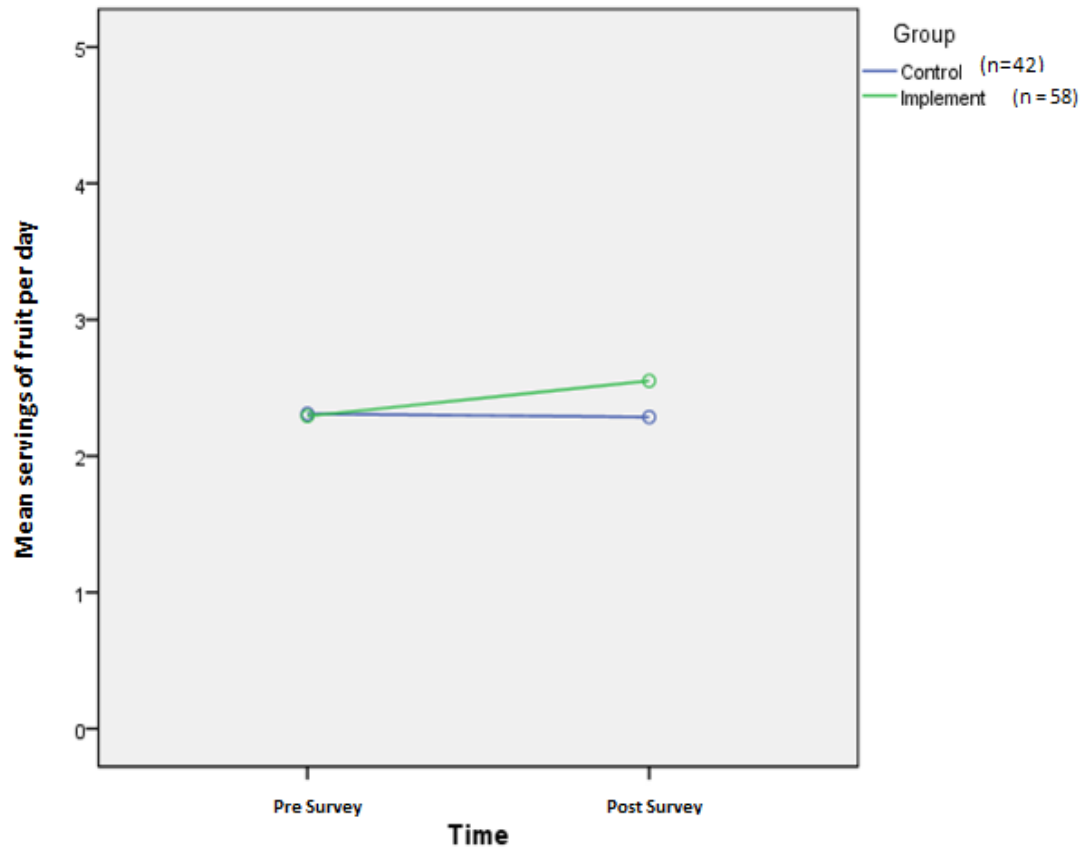


Figure 4.2 Difference in Mean Servings of Fruit Consumed per Day between Control and

Figure 4.2 represents the number of fruit servings between pre survey and post survey comparing implementation group and control. Although the difference was not statistically significant, there was a visible increase in servings of fruit in the implementation group. As seen in figure 4.2 the implementation group increased

their fruit consumption by about a quarter of a serving, which would equal a quarter of a cup.

Figure 4.3

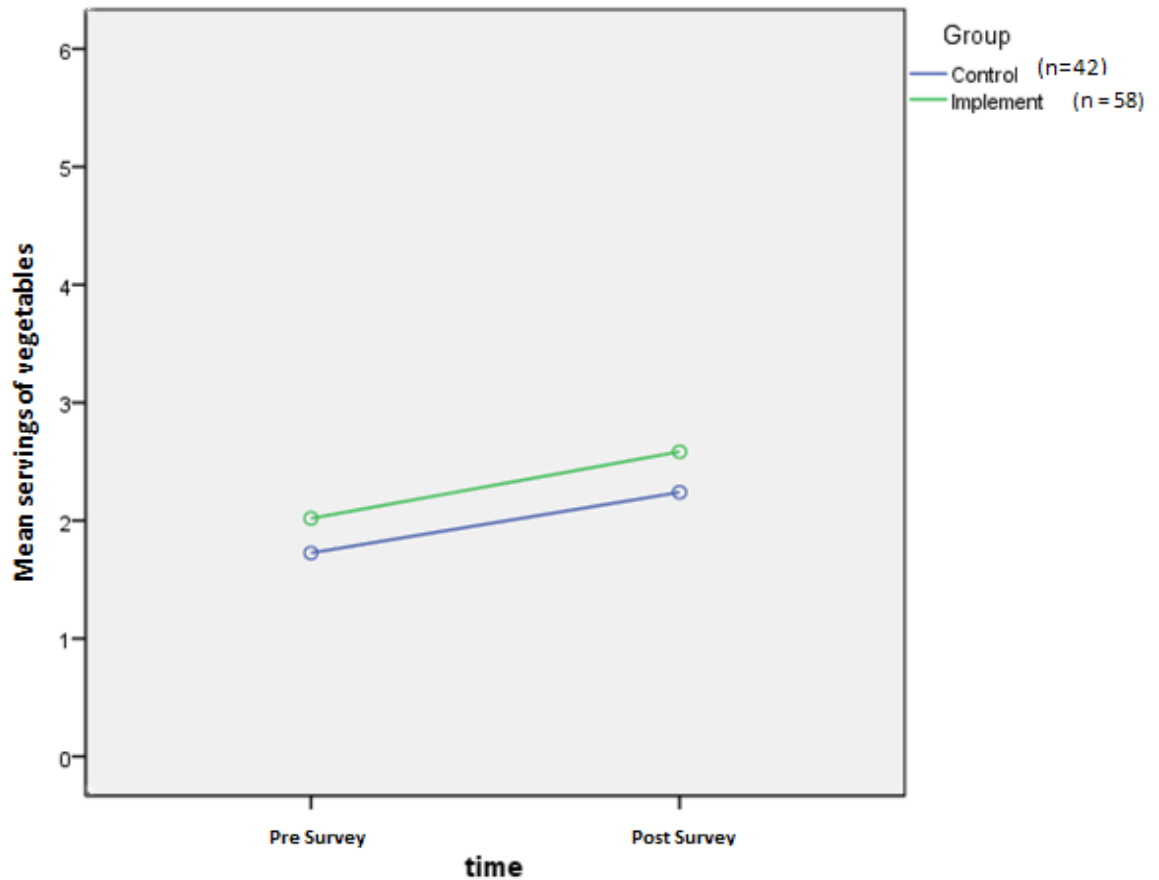


Figure 4.3 Difference in Mean Servings of Vegetables Consumed per Day between Control and Implementation

Figure 4.3 represents the mean vegetable intake between pre and post survey. The vegetable intake increased for both control and implementation group similarly. Both groups increased approximately a quarter of a serving. There was no

significant difference between the groups nor was there a significant difference within groups. This increase might be because the curriculum encouraged fruit consumption and the increase may have been a result of the curriculum and not due to an actual increase in fruit intake.

Results for Changes in Knowledge from Pre- and Post- Surveys

Table 4.6 represents the between group effect of the curriculum and different factors such as gender and age. This represents the difference in mean knowledge score between the control group and the implementation group. The Gender, Crew, and Age effect is how these different variables affect the mean knowledge score of each group.

Table 4.6 Difference in Knowledge Score Between Control and Implementation Group and the Effect of Gender, Crew and Age on Knowledge Score between the Two groups.

Question	Group effect	Gender effect	Crew effect	Age effect
Question7 Pyramid	.766	.750	.676	.274
Question 8 Food Label	.372	.370	.860	.487
Question 9 Serving Cheese	.008*	.054	.938	.619
Question10 Healthy Cooking	.210	.006**	.088	.174
Question 11 Unit Price	.844	.124	.994	.480
Question12 Plate Method	.007***	.021****	.257	.965
Question 13 Definition HI	.588	.818	.702	.244
Question 14 HI Coverage	.809	.118	.726	.067
Total knowledge	.950			

HI=Health Insurance

Significance was determined with an α level of .05

*Question 9 had a significant group effect, which indicates there was a significant difference in mean knowledge scores between the control and implementation group.

**Question 10 had a significant gender effect, which indicates there was a significant difference in the knowledge score of male and female between the two groups although the mean knowledge score between the two groups was not significant.

***Question 12 had both a significant difference in mean knowledge score between groups and between genders.

Table 4.7 represents the difference in mean knowledge score as affected by the time between pre- and post- survey (See appendix D). A significant difference in time effect would indicate a significant difference in mean knowledge score between the control group and implementation group from pre to post survey. When the data was re-analyzed for ages 20 years and under, there was significance for

question 9, but no significance for any other question. (For complete results for knowledge questions please refer to appendix D).

Table 4.7 Difference between Groups in Knowledge Score from Pre- to Post- Survey*

Question	Group time effect	Gender time effect	Age time effect
Question 7 Pyramid	.573	.757	.212
Question 8 Food Label	.815	.173	.446
Question 9 Serving Cheese	.073	.402	.709
Question 10 Healthy Cooking	.699	.419	.903
Question 11 Unit Price	.531	.968	.849
Question 12 Plate Method	.400	.103	.544
Question 13 Definition HI	.617	.421	.695
Question 14 HI Coverage	.961	.193	.364
Total knowledge	.093		

Significance was determined using an α of .05

**See Appendix D for survey questions*

There is no significant time effect on knowledge between groups as seen in Table 4.6. This means that there is no significant difference in percent of correct scores in implementation or control group from pre to post survey. After taking out all of corps members over the age of 20 years, there is no difference in significance. (For knowledge questions for ages 20 years and under please refer to Appendix G).

Figure 4.4

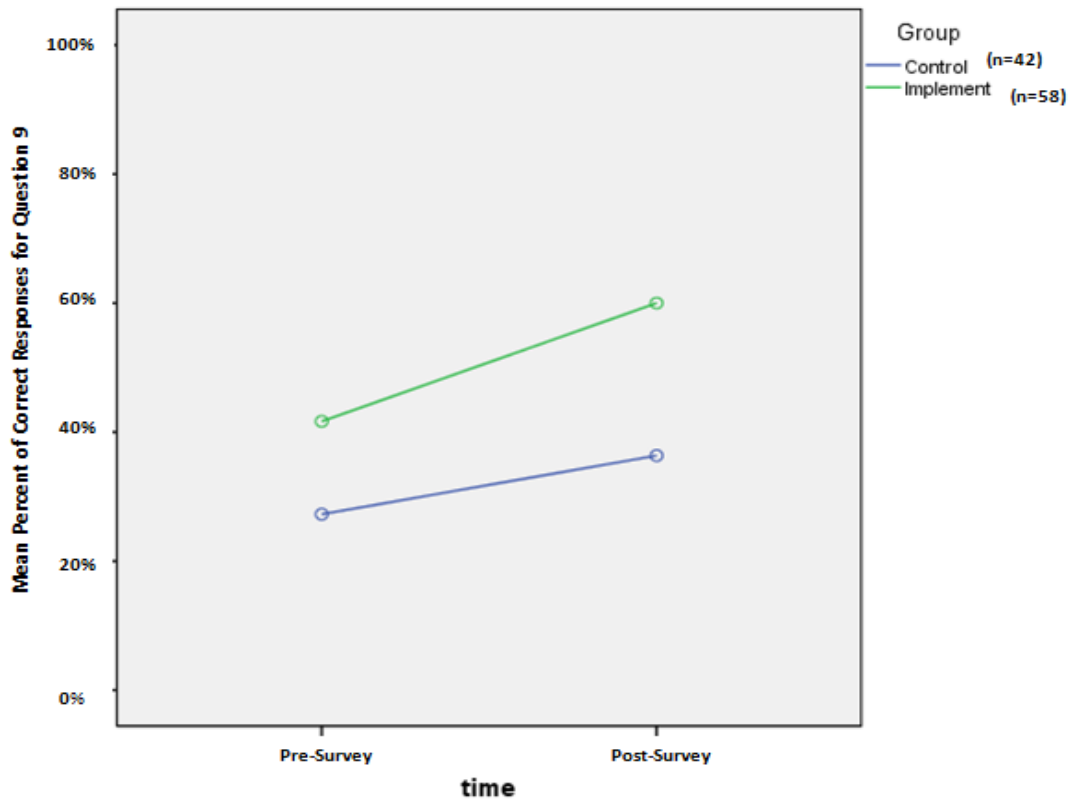


Figure 4.4 Difference in Knowledge Score between the control and Implementation Group

Figure 4.4 represents the mean percent of correct responses for question 9 of the survey regarding the serving of cheese (*Appendix D*). As described in Table 4.6 there is a significant difference in score between control and implementation groups. The implementation group had a higher knowledge score in both pre and post survey as represented by percent correct in the above figure. However, there was no significant increase in knowledge between the implementation and control group (Table 4) because both groups increased their knowledge score by a similar percentage.

Figure 4.5

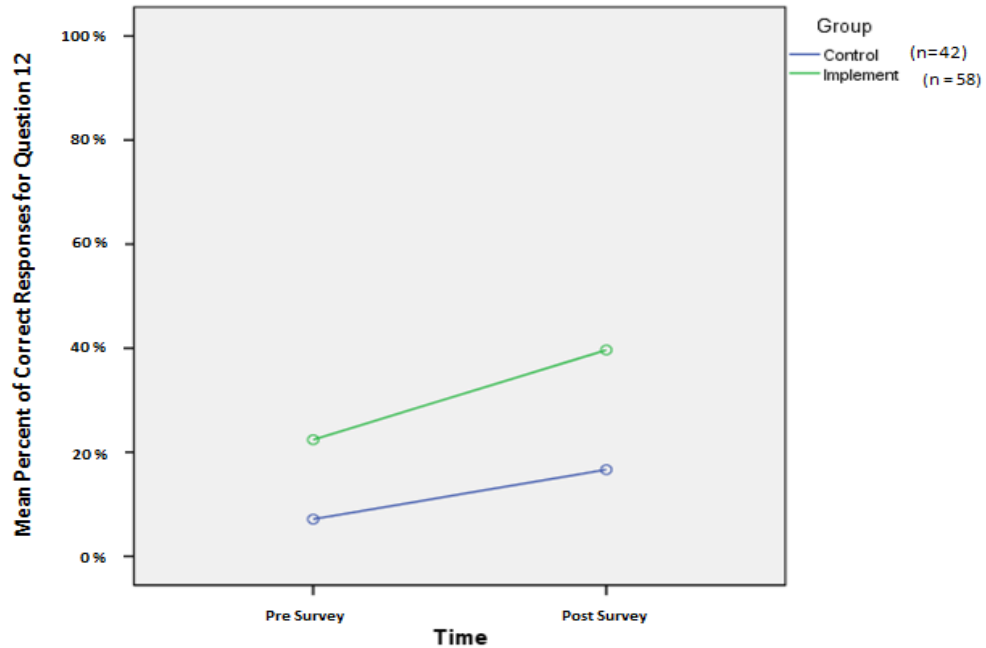


Figure 4.5 Difference in knowledge scores between the Control and Implementation group for Question 12

Question 12, which asks about the plate method (*Appendix D*). As described in table 4.6 there is a significant difference in score between Control and Implementation groups. The Implementation Group had a higher knowledge score in both pre- and post- survey as represented by percent correct in the above figure. However, there was no significant increase in knowledge between the Implementation and Control group (Table 4.7) because both groups increased their knowledge score by a similar percentage. (Graphs for all Questions are located in *Appendix H*).

Table 4.8: Paired Sample T-test, Comparing within Group Pre and Post Survey for Knowledge Questions 7-14.

	Control Group	Intervention Group
Question 7 (Pyramid) Pre and Post Survey	.809	.188
Question 8 (Food Label) Pre and Post Survey	.173	.128
Question 9 (Serving Cheese) Pre and Post Survey	.752	.001*
Question 10 (Healthy Cooking) Pre and Post Survey	.767	.811
Question 11 (Unit Price) Pre and Post Survey	.812	.066
Question 12 (Plate Method) Pre and Post Survey	.027*	.560
Question 13 (Definition HI) Pre and Post Survey	.720	.536
Question 14 (HI Coverage) Pre and Post Survey	.360	.811

HI=Health Insurance

The Paired Sample T-test was performed within each group to compare the pre and post survey answers within the Control and Implementation group. On question 9, there was a significant difference between pre and post survey answers for question nine but there was no significant difference between pre and post survey for the control group. There was a significant difference between the Control group pre the post survey on question 12. This data reinforces the trends from the repeated measures analysis and tables 4.6 and 4.7.

Program Acceptability

Feedback from corps members and crew leaders was used in assessing the *Healthy Lifestyles* curriculum.

Corps member feedback

Responses from corps members regarding the program acceptability were divided into two categories: acceptability of the overall program and acceptability of each individual unit. Due to the lack of diversity among the crews, the results were not broken down further in this phase of the project. Members were asked to rate the overall program on a scale from one to five (1='did not like it at all'; 5='liked all of it'). The results of this question are reported in Table 4.5 as an overall rating for the overall curriculum and for each unit individually.

Table 4.9 Overall Acceptability of the Curriculum and Acceptability of each Unit for All Ages and Ages 20 Years and Under

	20 years and under	All ages
Total Acceptability	3.02	2.83
Unit 1: Importance of a Healthy Lifestyle	3.19	3.04
Unit 2: tools for Success	3.24	3.07
Unit 3: How to Avoid Marketing traps	3.48	3.21
Unit 4: Eat Smart!	3.55	3.26
Unit 5: Eat Well for Less	3.52	3.28
Unit 6: Healthful Meals, Quick!	3.18	2.94
Unit 7: Keeping Your Food Safe	3.16	2.92
Unit 8: Access to Health Insurance	2.95	2.77

Table 4.9 represents the acceptability of the curriculum on a Likert scale. Question 15 asked the overall acceptability of the curriculum and there were separate questions pertaining to each individual unit. (For a reference of the question and format of this portion of the survey please refer to *appendix E*). The

mean score varied slightly between the units. The three on the scale meant that they neither liked nor disliked the curriculum. The highest scoring unit was Unit 5 and the lowest scoring unit was Unit 8. When analyzing only the data from corps members 20 years and under the overall acceptability and the acceptability of each unit was slightly greater.

The last page of the survey contained questions for the Implementation Group. The first question asked them what other topics related to healthy lifestyles they would like to learn about and the other question asked them what else they would like to say.

Q17. What other topics related to a healthy lifestyle would you have liked to learn about?

In regards to the curriculum, corps members wrote the following comments on their post-surveys; “some healthy (and cheap) recipes and how to eat day to day and remain healthy; more dinner meals.” Many participants wanted more included on physical activity and made the following suggestions: “maybe about how different foods affect your body’s performance; building strong muscles, bones, and joints” and “what foods to eat to help repair injuries; healthy exercise methods; how to exercise safely.” Some participants wanted “more focus on topics that aren’t common knowledge” such as “treatment of food products (animal/vegetables) prior to reaching the table; organic and free range; food manufacturing processes; more about MSG, trans fats, saturated fats, complete proteins, etc.” Some participants wanted more in depth information about health insurance, food labels, and outdoor

life. Many participants thought the information was too basic and wanted the curriculum to contain “information geared toward an older audience.”

Q 18. Is there anything else you would like to tell us?

Some participants were frustrated with the curriculum and said, “I knew almost all of the information already,” and “the content of the program seemed more appropriate for 12 year olds; I thought healthy lifestyles would be better directed at a younger age group instead of college students.” A few participants suggested the curriculum be more in depth. In addition, another comment was that the curriculum should not be so repetitive.

On a positive note one participant thought that *Healthy Lifestyles* was a “good program!” Another participant said, “I really enjoyed the healthy lifestyle program. It really got me to watch the types of food I was eating and the serving sizes.”

Crew Leader Feedback

Crew leaders were asked to complete an instructors’ notes page after completing each of the eight units. As shown in appendix I), the instructor’s notes page included a series of open-ended questions designed to assess program acceptability. More specifically, the series of questions were related to how well the unit flowed, participants’ reactions to the unit, whether or not participants were engaged in the lesson, suggestions for improvement, and additional questions or comments.

All of the Implementation crews provided feedback to the questions posed in the instructor's notes pages. Larimer Youth Conservation Corps provided additional feedback of the overall curriculum in addition to the instructor's note pages.

Question: What is your overall impression of this unit? Does it flow? Any suggestions to improve flow?

- *Unit 1: Importance of a Healthy Lifestyle*

Southwest Conservation Corps thought that the unit was "structured well" but they suggested we make the information "up to date." Mile High Youth Conservation Corps commented that "overall the flow was good. At some point it got a bit repetitive." Larimer County Conservation Corps thought that the curriculum contained "really basic health stuff" and it was "a little basic for some members."

- *Unit 2: Tools for success- Reading Food Labels and Ingredient Lists*

Southwest Conservation Corps thought that the unit "does not apply to trail work," but they also said, "good flow, perhaps too easy for group." Mile High Youth Conservation Corps day crew disagreed and commented that the unit "doesn't flow super well, could use more activities." The Larimer Youth Conservation Corps crew leader said, "I enjoyed the info it was new material for some members and it was easy to facilitate."

- *Unit 3: How To Avoid Marketing Traps*

Southwest Conservation Corps did not like this unit and said, "think about skipping this chapter, does not apply," and "generally too easy for group." Larimer County Youth Conservation Corps agreed and stated that unit 3 "regurgitated unit

two,” and it was a “major review of the previous unit.” The Mile High Youth Conservation Corps offered the suggestion that we include “more info about different types of fat.”

- Unit 4: Eat Smart! Making Healthful Choices When You’re On-the-go

The Southwest Conservation Corps suggested that in unit four include “using meals to cook/or food in real life.” Mile High Youth Conservation Corps day crew thought it was a “pretty good unit, but a bit long” and they thought that, “activities and demos are good.” Larimer Youth Conservation Corps thought the material was “fairly basic” and said, “Our crew knew most of the material already.”

- Unit 5: Eat Well for Less!

Southwest Conservation Corps said that Unit 5 “flowed” and that it was “more interesting.” Mile High Youth Conservation Corps overnight crew thought the unit “flows well.” In contrast, the Mile High Youth Conservation Corps day crew said, “This is a boring lesson.” They thought the information in the unit was “way too obvious” and the unit “could be shorter.” Larimer Youth Conservation Corps commented that the unit contained “too much info over where the crewmembers are in their lives” because “they still live at home and were disinterested in CSA and shopping on own.”

Unit 6: Healthful Meals, Quick

The Southwest Conservation Corps said the unit was “generally too easy,” and the unit should be at an “increased level.” Mile High Youth Conservation Corps

day crew commented “it’s a good lesson!” and the crew leader said, “I liked the plate activity.” Mile High Youth Conservation Corps overnight crew thought the unit had “good flow with some fun group activities.” Larimer County Youth Conservation Corps did not complete the unit.

- *Unit 7: Keep Your Food Safe*

Southwest Conservation Corps said the unit should be “more informative.” Mile High Youth Conservation Corps day crew said, “Good unit, should have come earlier in the book.” Mile High Youth Conservation Corps overnight crew commented that the unit “flows well, but too many known facts.” Larimer Youth Conservation Corps did not complete the unit.

- *Unit 8: Health Insurance*

Southwest Youth Conservation Corps “Did not finish” the unit. Mile High Youth Conservation Corps thought the “wording” was “a bit tough.” Larimer Youth Conservation Corps did not complete the unit.

Question: How did Corps members react to this unit? Did they find the topics interesting? Were they engaged?

- *Unit 1: Importance of a Healthy Lifestyle*

Southwest Conservation Corps said the corps members “did not enjoy” and that they were “not interested/ hard to stay engaged.” Southwest Conservation Corps- Las Valles said, “Generally they seemed to already understand the information from high school or other studies.” In contrast, Mile High Youth

Conservation Corps day crew said, "Corps members were especially engaged with the food group discussion and they all participated well." Larimer Youth Conservation Corps said that the corps members were "kind of engaged" and their crew was a "really healthy conscious crew to begin with so they found it very basic."

- *Unit 2: Tools for Success- Reading Food Labels and Ingredient Lists*

The Southwest Conservation Corps members were "disengaged because did not apply/felt dumbed down," and "generally thought" the information was "too easy." In contrast, the Mile High Youth Conservation Corps day crew said that "crewmembers were fairly engaged." The Mile High Youth Conservation Corps overnight crew said that the corps members "all loved this unit" and the "activities were very engaging." Larimer Youth Conservation Corps said the corps members "were fairly engaged" and "reviewed activity well and everyone learned something."

- *Unit 3: How To Avoid Marketing Traps*

Southwest Conservation Corps said, "By this time corps members were frustrated," and that the corps members "generally thought too easy." Larimer Youth Conservation Corps said that the "material was so familiar the crew was bored." In contrast, the Mile High Youth Corps day crew said the corps members "were engaged in reading labels and applied the new information well." The Mile High Youth Conservation Corps overnight crew "loved this chapter."

- *Unit 4: Eat Smart! Making Healthful Choices when You're On-the-go*

Southwest Conservation Corps “had a hard time applying it (the unit) to their lives.” SCC-LV said they “generally thought (the unit) too easy.” Larimer Youth Conservation Corps stated that their crew “knew most of it already so not as engaged as they could have been.” Mile High Youth Corps day crew said the corps members “were engaged but they also defended fast food items enthusiastically.” The Mile High Youth Corps overnight crew said, “All were engaged, but not all took the lesson to heart.”

- *Unit 5: Eat Well for Less!*

Southwest Conservation Corps said their crew “Generally thought (the unit was) too easy.” The Mile High Youth Corps day crew said the corps members “thought it was lame and obvious.” Mile High Youth Conservation Corps overnight crew “seemed engaged, but (the information “was a bit elementary.” Larimer Youth Conservation Corps stated that “most of the members aren’t shopping for themselves so (they were) not super into it.”

- *Unit 6: Healthful Meals, Quick*

The Southwest Conservation Corps were “not engaged,” and “generally though (the unit) was too easy.” Mile High Youth Corps day crew “were well engaged during the plate activity and found it interesting” and the night crew said, “all loved this chapter.” Larimer Youth Conservation Corps did not complete the unit.

- *Unit 7: Keep Your Food Safe*

The Southwest Conservation Corps members “did not follow” and they suggested to “make it (the curriculum) apply to them.” The Mile High Youth Corps said the corps members were “interested because it affects them daily.” Larimer Youth Conservation Corps did not complete the unit.

- *Unit 8: Health Insurance*

Southwest Conservation Corps-Las Valles and Larimer Youth Conservation Corps did not complete the unit. Mile High Youth Corps day crew said their corps members were “pretty well engaged.” Mile High Youth Corps overnight crew said their corps members were “not engaged in actual lesson, but did create good group discussion based on topic.”

Question: What are some suggestions for improving this unit?

- *Unit 1: Importance of a Healthy Lifestyle*

Southwest Conservation Corps said, “make lesson appropriate for age group.” The Mile High Youth Corps day crew would like “more activities for corpmembers” and “less repetitive in the questions.” Mile High Youth Corps overnight crew thought the “charts are somewhat confusing.” Larimer Youth Conservation Corps would like “more in depth information.”

- *Unit 2: Tools For Success- Reading Food labels and Ingredient Lists*

Mile High Youth Corps would like “more info on carbohydrates and nutrients and vitamins (what they do specifically)” and they said, “servings should be uniform

to serving sizes in unit 1 to limit confusion.” Larimer Youth Conservation Corps thought that it would be a good idea to “combine this unit with unit number three.”

- *Unit 3: How to Avoid Marketing traps*

Mile High Youth Corps said that, “some labels weren’t clear about the marketing trap,” and they did not “have all packet items.” Larimer Youth Conservation Corps thought that it would be good to “combine (this unit) with number two.”

- *Unit 4: Eat Smart! Making Healthful Choices when You’re On-the-go*

Mile High Youth Corps would like “more information about how unhealthy different items are” and they thought “activities need changed.” Larimer Youth Conservation Corps thought it would be a good idea to “combine (this unit) with number 5.”

- *Unit 5: Eat Well for Less!*

Mile High Youth Corps day crew thought that it would be good to “cut it and combine unit price with another lesson,” and the overnight crew would like to see “more emphasis on budgeting.” Larimer Youth Conservation Corps said, “Combine with number 4” and said, “it would bring awareness but not go into so much depth.”

- *Unit 6: Healthful Meals, Quick*

Southwest Conservation Corps-Las Valles and Larimer Youth Conservation Corps did not complete this unit. Mile High Youth Corps would like some “Recipe suggestions.”

- *Unit 7: Keep Your Food Safe*

Mile High Youth Corps day crew wanted “more information about food borne illnesses and what foods can be safely kept in lunches.” Mile High Youth Corps suggested making the unit more “interesting by using better examples, maybe show state laws for restaurants.” Larimer Youth Conservation Corps did not complete unit.

- *Unit 8: Health Insurance*

Mile high Youth Conservation Corps day crew and overnight crew would like more “info about universal health care, pros and cons.” Larimer Youth Conservation Corps did not complete unit.

Question: Any additional comments/questions?

- *Unit 1*

Mile High Youth Conservation Corps suggested providing “more concrete examples of foods that are higher up on the food pyramid.”

- *Unit 2*

The packet was not complete for the Mile High Youth Corps so they were not in possession of the complete packet.

- *Unit 3*

Mile High Youth Corps day crew thought this unit was “a bit repetitive but served to reinforce info well.” Mile High Youth Corps overnight Crew said, “We are learning a lot.”

- *Unit 4:*
Mile High Youth Corps said, “Some feel the chapters were dumbed down. This chapter seemed worthless/could have been incorporated in another chapter.”

- *Unit 5:*
The crew leader for Mile High Youth Corps said, “my crew was mostly 18-20 YO so this info was a bit boring.”

- *Unit 6:*
No comments on this unit

- *Unit 7:*
The crew leader for Mile High Youth Corps overnight crew said, “most of the chapter seemed to be common knowledge among my crew.”

- *Unit 8:*
Mile High Youth Corps overnight crew want “better activity.”

Notes:

- *Unit 1:*
Mile High Youth Corps day crew thought, “overall the unit was helpful and was a good starting point in the healthy lifestyle curriculum.”

- *Unit 2:*
Mile High Conservation Corps day crew thought that the “serving size of cheese was confusing because everything else was 3oz or so we thought. Why was this different from the 8oz serving sizes from unit one?”

- *Unit 3:*
Mile High Youth Corps day crew thought the unit was “overall helpful” but would like “more information about what type of fats are good and bad and how much of each we should eat.”
- *Unit 4:*
Mile High Youth Corps day crew said, “It would also be helpful to include some healthy fast food alternatives.”
- *Unit 6:*
Mile High Youth Corps said, “We used our activities to come up with new meal ideas!”
- *Unit 8:*
Mile High Youth Corps overnight crew said, “Thank you for putting this curriculum together, we all enjoyed it.”

Overall feedback from Larimer Youth Conservation Corps:

“We didn’t have the time to get through all 8 units. There was so much to cover with the regular EE (environmental education) that it was even more challenging to squeeze in Healthy Lifestyles too.

We had a really healthy crew to begin with so many of the crew members knew a lot of the material already.

I think this curriculum could have been a little more helpful for a different, less healthy crew.

Overall, I didn’t really enjoy facilitating this material. It was a little basic and our crew wasn’t super into it. I think with some revision it could be effective if there

were like 4 lessons instead of 8, there would be a possibility of getting through the material.

Also, our apologies, but Jess the control group leader, was not able to get the post surveys finished.

Thank you for the opportunity to try this program out, hopefully it can be shorter in the future.”

CHAPTER 5

DISCUSSION

Obesity has become an epidemic and the prevalence of the disease continues to rise affecting all races and ethnicities. There have been many efforts to prevent and control this epidemic; however, certain portions of the population are not reached by these efforts. Youth-based interventions have been focused in the schools, and these school-based interventions are limited to school-aged children. There is a population of youth and young adults between the ages of 14-25 who may or not be attending school, but are participating in a program such as the Colorado Youth Conservation Corps. This population does not benefit from the school-based programs. There is a critical need to reach adolescents and young adults because they are more likely to benefit from a program targeting behavior change because they are still developing behaviors that they will carry with them into adulthood. The use of behavioral modification skills in programs for the treatment and prevention of obesity in adolescent is linked to better outcomes (Kelly et al 2008).

The results from this project indicated that the average age of participants was older than expected. The average age for this program was 20 years and this is the age in which someone is considered to be a young adult. There is a greater focus on childhood and adolescent obesity prevention programs because it is easy to work with children while they are in school and because these programs targets them

during their formative years. Adult obesity strategies tend to focus more on the public realm or through worksite programs. For example, the Centers for Disease Control have started the Healthier Worksite Initiative (HWI), which is a resource for workforce health promotion. The Centers for Disease control encourage companies to implement workforce health promotion in order to cut the health care cost of obesity and promote a healthier workplace. Young adults may not benefit from worksite wellness programs because they may be still attending college or they may be working at entre level jobs that do not offer such benefits.

Younger adults tend to have an average weight gain of 1-2 lb per year and the largest weight gain occurs during the early to mid-twenties (Gokee-LaRose 2009). This means that this period of the lifespan is a key time for intervention or prevention of overweight and obesity. Generally, these young adults are not targeted for adult weight loss programs, which tend to be targeted to older adults. Many weight loss and obesity prevention programs exist for children and adolescents as well as older adults. Many young adults do not enroll in weight loss/healthy lifestyle programs. In a study by Gokee-LaRose which used data from completed National Institutes of Health funded (Behavioral Weight loss programs) BWL trials it was found that only 7% of all participants were <35 years of age and for those young adults who did enroll they had poor attendance and retention rates and poorer weight loss outcomes (Gokee-LaRose 2009).

This research could provide insight into why many of the older participants were not engaged in the curriculum. The curriculum was geared to a teenage/adolescent audience, but perhaps even if the curriculum was geared

toward an audience of young adults it is hard to deduct whether the outcomes would have been better.

Study Findings

The purpose of this program was to assess the outcomes from the *Healthy Lifestyles for Youth Corps Members* program with members of the Youth Conservation Corps in Colorado. The measured outcomes are changes in the attitudes, behavior and knowledge about healthful eating and activity. Until this point, there had been no health-based curriculum designed for or used with this audience. This study assessed qualitative and quantitative feedback from a variety of sources to determine changes in attitude, knowledge and behavior as well as acceptability of the program.

Changes in Attitudes and Behavior

Based on the results there were no significant changes in attitudes or behavior towards healthy lifestyles for the Implementation Group. The group did decrease the number of meals that were eaten out from pre to post survey going down from almost five meals eaten out a day to three. When re-analyzing the data for corps members aged 20 years and under the results did not change very much. Most of the participants were already eating healthfully, and most of the participants rarely or never ate fast food. The number of meals eaten outside of the home for the implementation group was close to two meals eaten out, which did not leave much room for improvement. The serving of fruit was around 2.5 and 2 servings per day, respectively for the pre survey. A study by Krebs-Smith et al using

a 3-day dietary recall from respondents in the US Department of Agriculture's 1989-1991 continuing Survey of Food Intakes by Individuals found that half of all children ages 2-18 years consumed less than half a serving of fruit per day. In addition, only one in five children consumed five or more servings of fruits and vegetables per day (Krebs-Smith et al 2001). The standard for fruit and vegetable intake is two or more servings of fruits and three or more servings of vegetables per day. According to this data 2-3 servings of fruits and two servings of vegetables is better than the average child/young adult in the US. According to the Department of Public Health and Environment Results from the Colorado Youth Risk Behavior Survey 2005 indicated that 19% of Colorado youth grades 9-12 were consuming greater than five servings of fruit and vegetables a day (Shupe 2006). This indicates that almost a quarter of the youth in Colorado are already consuming more than the recommended servings of fruit and vegetables per day. Although obesity rates are on the rise for all states, Colorado continues to have the lowest adult obesity rate at 18.6 percent (CDC 2010). Many people who live healthy and active lifestyles are attracted to Colorado. Perhaps the low obesity rate is because so many people who live here are active and healthy, especially the adults and young adults who may have grown up being active or moved here in order to be able to live their healthy lifestyles.

Attitudes of the participants at the pre-survey were also good because most corps members responded that they never supersized their fast food meals or did not supersize very often. This creates very little room for improvement from pre- to post- survey for this answer. When asked where they purchased food 90% of the corps members responded that they purchased food from the grocery store. This

percentage did not change from pre to post survey. There are several reasons for why the participants responded that they rarely or never supersized their meals. Perhaps they are never supersizing their meals, especially after movies such as “supersize me” and the pressure on fast food restaurants to discontinue asking customers if they want to supersize their meal. This could also be because participants are aware that supersizing is viewed negatively and there may have been some response bias.

Changes in Knowledge

There was not a significant change in overall knowledge score but question 9 (cheese serving question) and 12 (plate method) did see a significant increase in knowledge for the Implementation Group as compared with the Control Group. Question 9 (cheese serving question) asked corps members what object equals a serving of cheese in size and question 12 (plate method) asks how much of the plate when using the plate method should contain vegetables. When the data was re-analyzed to only include corps members ages 20 years and under the significance remained limited to only question 9.

When looking closer at question seven (MyPyramid), 80% of the participants answered the question correctly on the pre survey and post survey about 85-90% answered the question correctly. Question 7 was not significant, however with 80% of corps members answering it correctly in the pre survey so there was not much room for improvement and this could represent a ceiling effect. For question eight both the Implementation Group and the Control Group increased from

approximately 60% correct answers on the pre survey to 70% correct this increase was no significant within groups nor between groups. Question 10 (healthy cooking), 11 (unit price), 13 (definition of health insurance) and 14 (health insurance coverage) all had a ceiling effect similar to that of question 7 (MyPyramid) with approximately 90% of participants answering the question correctly in the pre-survey leaving no room for improvement in the post survey. Question 11 (unit price) had pre-survey answers that were 80% correct for both the Implementation Group and the Control Group and both groups increased to nearly 100% correct on the post-survey. On question 13 (definition of health insurance) both pre and post survey answers were 80% correct for both the Implementation Group and the Control Group. On question 14 (health insurance coverage), 85% of corps members for both groups answered the question correctly on both pre and post survey with no significant increase in correct answers. Figures for questions 7, 8, 10, 11, 13, and 14 can be found in Appendix G.

When the validity and reliability of the survey was tested only a few questions were changed for clarity, but there was no major ceiling effect. The ceiling effect in the results of the implementation of the curriculum could be due to a number of factors. When the corps members were asked to comment about the curriculum there were several comments that they knew the content already. Perhaps this sample of corps members had previously taken a comprehensive health class. One crew leader pointed out that their crew was already health conscious. Many of the corps members were shopping at the grocery store (or their parents were), they did not eat meals out often and they rarely supersized their

meal. It is possible this sample of youth corps members was already very healthy and already knew most of the material through previous classes, parents, or other outside influences (*appendix H includes additional figures from survey responses*). According to results from the Youth Risk Behavior Survey 2005, 10 percent of adolescents grades 9-12 were at risk for becoming overweight, 9.8 percent were overweight, 70 percent participated in vigorous physical activity, and 73 percent watched two or fewer hours of TV per day (Shupe 2006). This suggests that teenagers in Colorado are already fairly healthy which would explain the results of this program.

Another comment made by corps members was that the curriculum would be better for a younger audience. The *Healthy Lifestyle* curriculum had to be designed for a broad range of ages (14-25), but after the original needs assessment in phase one, the program was designed for more of a teenage audience. The average age of the participants in phase one was 18, with a range of 16-22 years. For phase two, the average age of the implementation group was around 19-20 with an age range of 16-26. This was slightly older than the age of phase one with a larger range of ages. Although the age of 18 is not much different from 19 or even 20, the oldest participant was 26. This could be the reason why the participants felt the curriculum would be better for a younger audience. A few participants commented that they were in college, which indicates that the corps members were older and had some higher education. However, after re-analyzing data (upon request from CYCA) there was no significance for the participants ages 20 years and under. The data was analyzed for ages 20 and under upon request from the Colorado Youth

Conservation Corps. It is interesting to note that there were no corps members who participated that were under 17 years old. The majority of the participants 20 years and under were between 17-20 years. The Youth Corps typically employs youth between 14-25 years and the *Healthy Lifestyles Curriculum* was developed for adolescents ages 14-20, which was indicated to be the largest age group participating in the Corps. In this sample corps members aged 14-17 years were not well represented and would benefit the most from such a curriculum.

The Youth Conservation Corps has traditionally employed and trained youth between the ages of 14-25 with many of these youth identified as low-income, at risk, and/or ethnic minorities. It has been identified that this demographic of young adults could benefit from a healthy lifestyle intervention. It is possible that with the recent economic crisis and loss of jobs in the United States and more specifically Colorado there could have been a different demographic of young adults in the Colorado Youth Conservation Corps. Young adults who in the past may have easily found summer employment might have had to look harder for summer employment due to the current economy. Youth who were from middle class and upper class families and were preparing for college or already attended college might have been more inclined to join the youth corps in a time when traditional summer jobs were scarce. This could explain why many of the corps members thought the curriculum should be geared to a younger audience and why they knew most of the information already.

One of the limitations of phase one was the small sample size, which was not conducive to meaningful statistical analysis. In phase two, the sample size was

much larger. This could have provided a much better insight into the effectiveness of the program as a whole. It is possible that the curriculum is just not appropriate for this audience. Another limitation from the first phase of the project was the lack of formative research regarding the youth corps members needs and wants. Although there was a needs assessment done in the first phase to guide program development and to determine feasibility of implementing a healthy lifestyles program of youth conservation corps in Colorado. This needs assessment was done in the form of group discussions in a single one-hour session at each of the participating youth corps led by a researcher from Colorado State University. This needs assessment from the first phase of the project may not have been enough to define the needs and wants of the target population. The Colorado Youth Conservation Corps indicated that they already knew what the corps members would want in the curriculum, but clearly based on the results from the second phase of the project this was not the case.

In the introduction, there is a brief discussion of Native Americans and specific issues related to this population and obesity. During the first phase of the project, there were a large percentage of Native Americans participating in the participating crew. For this reason, information was included on Native Americans, however in 2009 only 5% of participating corps members were Native American and in phase two, only one member in the control group was Native American. In the introduction, it is mentioned that Native Americans are at increased risk for obesity and associated co-morbidities so there is a need for obesity prevention in

this group of individuals. however, data from phase two and from 2009 suggest there is not a need to focus on this population.

The Larimer Youth Conservation Corps did not complete units 6-8 and Southwest Conservation Corps did not have time to complete units 6 or 8. This could have confounded the results.

Program Acceptability

Program acceptability was addressed through the feedback received from corps members and crew leaders. Corps member feedback was divided into two categories: acceptability of the overall program and the acceptability of individual units. Overall, the program was rated as neither really good nor bad, but when the data was re-analyzed for ages 20 years and under the program was rated slightly higher. This could indicate the program would be better adapted to an accepted by younger audiences.

Strengths and Limitations

The relatively large sample size could provide more information about the effectiveness and acceptability of the *Healthy Lifestyle Curriculum for Youth Corps Members*. A larger sample size provides more information and is generally more representative of the Colorado Youth Corps as a whole. The use of a control group provided a group for comparison and to ensure the results were not due to chance. During the first phase of the project, there was a difference between the two training sessions, which established an uneven starting point between the two youth conservation corps. The training in this second phase of the project was

uniform with plenty of time for the training and ensuring the crew leaders were able to offer the trainers their full attention. During the first phase of the project there were no data available regarding the demographic of the entire Colorado Youth Corps population. For phase two data was available regarding demographic profile of the 2009 youth corps members. This demographic profile could be used to compare the study demographic to the Youth Corps of Colorado.

Limitations could include the geographical distance between the researcher and the location of the youth conservation corps which did not allow for observation to ensure program fidelity. The researcher's role as co-author of the *Healthy Lifestyles* curriculum may have introduced personal biases on interpretation of the data. The demographic profile was limited to youth corps members in Colorado and there is no information provided as to the demographics of youth corps members in other states or the nation. Two of the youth corps in the implementation crew did not complete the curriculum. The survey that was given to the corps members was self-reported data. There may have been a Hawthorn effect in which the participants in this *Healthy Lifestyles* program may have shown an increase in performance from pre- to post- survey simply because they received the special attention of the curriculum and not because of an actual intervention effect. The large fruit and vegetable consumption seen in this program may have been due to response bias. In other words the participants may have responded to the question based off previous knowledge that fruit and vegetable intake is encouraged but their response may not accurately depict actual fruit and vegetable consumption. There was a ceiling effect for many of the questions in the survey. There was a disconnect

between audience needs and agency wants. The youth corps made the assumption that they knew what their corps members would want in a healthy lifestyle curriculum and as a result an adequate needs assessment was never conducted. The curriculum was developed to address childhood obesity but it was implemented with adults with the average age of participants being 20 years.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

This phase of the *Healthy Lifestyle* project was important in testing the changes in attitudes, behavior, and knowledge related to healthy lifestyles. There were minimal changes in all three parameters. There is reason to believe that many of the participants already knew most of the information in the *Healthy Lifestyles* curriculum because many of the participants answered the knowledge questions correctly on the pre survey prior to the implementation of the curriculum. In addition, many of the participants already appeared to have positive attitudes toward healthy eating and engaged in healthy behaviors prior to the implementation of the curriculum. This indicates that there was not a proper understanding of the target population. The needs assessment in the first phase of the curriculum was not adequate and the curriculum was unable to address adequately the needs and wants of this population of a healthy lifestyles curriculum. The curriculum was targeted to adolescents and youth because the Colorado Youth Corps association thought this was the appropriate age group for the participating corps members, however data from this phase indicates that the curriculum may need to be changed to address a population of young adults rather than children.

Acceptability of the curriculum was modest. The older corps members generally thought the curriculum was too basic while many of the younger corps members found the curriculum more interesting. This could be expected due to the large age range. The participants who liked the curriculum the most were those who were the youngest in age. Most likely this is because the curriculum was designed for a teenage audience.

Recommendations

There are several recommendations for the future of the *Healthy Lifestyles* program based on the results from the completion of the second phase of this project. The first conclusion made from the results is that perhaps the demographics of the Youth Corps are changing to include an older, more educated audience. Many of the Youth Corps members wanted more in depth knowledge about the topics being addressed in the curriculum. This could have been avoided if the formative evaluation had been more in depth including focus groups and surveys. The *Healthy Lifestyles* curriculum was developed to be easily taught by crew leaders who are assumed to have limited knowledge in the topics being addressed. More in depth topics would also require more in depth knowledge of the subject. This poses a problem because the Colorado Youth Corps Association has limited funding. IN addition, finding instructors with a more in depth knowledge of the subjects would be difficult.

In the future a more in depth formative evaluation must be conducted. This could be done in the form of focus groups and surveys given to all participating

youth corps members. The survey would include questions regarding what the corps members would like to see in a healthy lifestyles curriculum. This would also give some insight into whether this curriculum is really even feasible with this audience. There is such a large age range of individuals who are eligible to participate in the Colorado Youth Corps that even if the curriculum was designed for a population of young adults the teenagers of the group may not benefit. In other words there are many cognitive, physiological, and psychological changes that occur between the ages of 14 and 25 years that it is not feasible to have a curriculum that will encompass the needs and wants of every individual.

The second recommendation is to shorten the curriculum by condensing and eliminating some of the topics considered too elementary and adding more in depth topics. Topics such as unit price and the section on using food co-ops was considered either uninteresting or not relevant. By eliminating such topics and adding more in depth information on some of the other topics might make the curriculum more applicable to an older audience.

Some of the comments by the crew leaders and the corps members were that there was not enough time to implement the curriculum because they also had another environmental component they had to cover. Combining units might also be a way to cut down on the amount of units in the curriculum, but it may also make some units longer than others. A recommendation would be to combine units 3 and 4 and units 5 and 6 to shorten the curriculum.

The size and format of the crew leader and corps member guide was determined by CYCA because they wanted something small that the crew leaders

and corps members could take with them in the field. The small font size made it difficult to read the curriculum and some of the formatting in both guides made it difficult to read. It would be recommended that both the crew leader guide and corps member guide be reformatted to include a larger font size and perhaps more “white space” to be easier to read and follow. In addition, aligning the text to the left and instead of justifying the text would make the guides easier to read. This might increase the size of the curriculum, but it would be easier to read and to teach.

A physical activity component was added to the curriculum but many participants wanted more in depth knowledge about physical activity. The third recommendation is to address physical activity and provide more information on the topic. Addressing physical activity is difficult due to the nature of the youth corps, where most crews are very physically active. Perhaps more instruction could be given for options for physical activity after the program is completed such as the importance of both strength and cardiovascular exercise.

In summary, the *Healthy Lifestyle* curriculum might have to include more in depth topics. This could be difficult due to the wide range of ages employed by the Youth Corps. The curriculum must also remain easy to teach by crew leaders. A suggestion would be to add optional activities that provide more in-depth information into some of the topics in the curriculum. The question remains of how to teach more in depth knowledge to the young adults while keeping the adolescent population of 14-19 year olds engaged. In addition, information that is appropriate for people between the ages of 20-25 years may not be appropriate for adolescents

ages 14-19 years. A healthy lifestyles program that incorporates two completely different developmental life stages may not be feasible.

Another thing to consider for the future of the *Healthy Lifestyles* curriculum is the amount of time spent on the curriculum. The curriculum was designed to be taught in about 20-30 minutes, which would mean that the entirety of the curriculum could be taught in about 4 hours. According to the School Health Education Evaluation (SHEE), 50 hours of health education are needed to make a large impact on health education of students (Connell 1985). Although this is for overall health education and is pertinent to school-based programs, perhaps dedicating such a small amount of time to teaching a healthy lifestyles curriculum may not have been enough to see results for changes in knowledge, attitudes, and behaviors for this program. If CYCA viewed this curriculum as valuable they may have to schedule more time for crew leaders to teach the curriculum, but this would cut down on time spent in the field working on conservation projects.

Overall, there is a great amount of work that has to go in to this curriculum before it can be implemented again. The curriculum would have to be redesigned to cover the needs and wants of the target population by doing an in depth formative evaluation. The curriculum would also have to be changed in order to capture a large age range, which may be difficult and out of the realm of expertise for many crew leaders.

CHAPTER 7

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APPENDICES

Appendix A: IRB Approval Letter



Research Integrity & Compliance Review Office
Office of the Vice President for Research
321 General Services Building - Campus Delivery 2011
Fort Collins, CO
TEL: # (970) 491-1553
FAX: # (970) 491-2293

NOTICE OF APPROVAL FOR HUMAN RESEARCH

DATE: November 18, 2009
TO: Anderson, Jennifer, PhD, Food Sci. & Human Nutrition
Bellows, Laura, Food Sci. & Human Nutrition, Melby, Christopher, Food Sci. & Human Nutrition, Swiss, Evelyn,
RICRO, KISSANE, Katie, Food Science & Human Nutrition
FROM: Barker, Janell, CSU IRB 1
PROTOCOL TITLE: Healthy Lifestyles for Youth Corps Members
FUNDING SOURCE: Colorado Health Foundation
PROTOCOL NUMBER: 09-832H
APPROVAL PERIOD: Approval Date: November 20, 2009 Expiration Date: November 19, 2010

The CSU Institutional Review Board (IRB) for the protection of human subjects has reviewed the protocol entitled: Healthy Lifestyles for Youth Corps Members. The project has been approved for the procedures and subjects described in the protocol. This protocol must be reviewed for renewal on a yearly basis for as long as the research remains active. Should the protocol not be renewed before expiration, all activities must cease until the protocol has been re-reviewed.

If approval did not accompany a proposal when it was submitted to a sponsor, it is the PI's responsibility to provide the sponsor with the approval notice.

This approval is issued under Colorado State University's Federal Wide Assurance 00000647 with the Office for Human Research Protections (OHRP). If you have any questions regarding your obligations under CSU's Assurance, please do not hesitate to contact us.

Please direct any questions about the IRB's actions on this project to:

Janell Barker, Senior IRB Coordinator - (970) 491-1655 Janell.Barker@Research.Colostate.edu
Evelyn Swiss, IRB Coordinator - (970) 491-1381 Evelyn.Swiss@Research.Colostate.edu

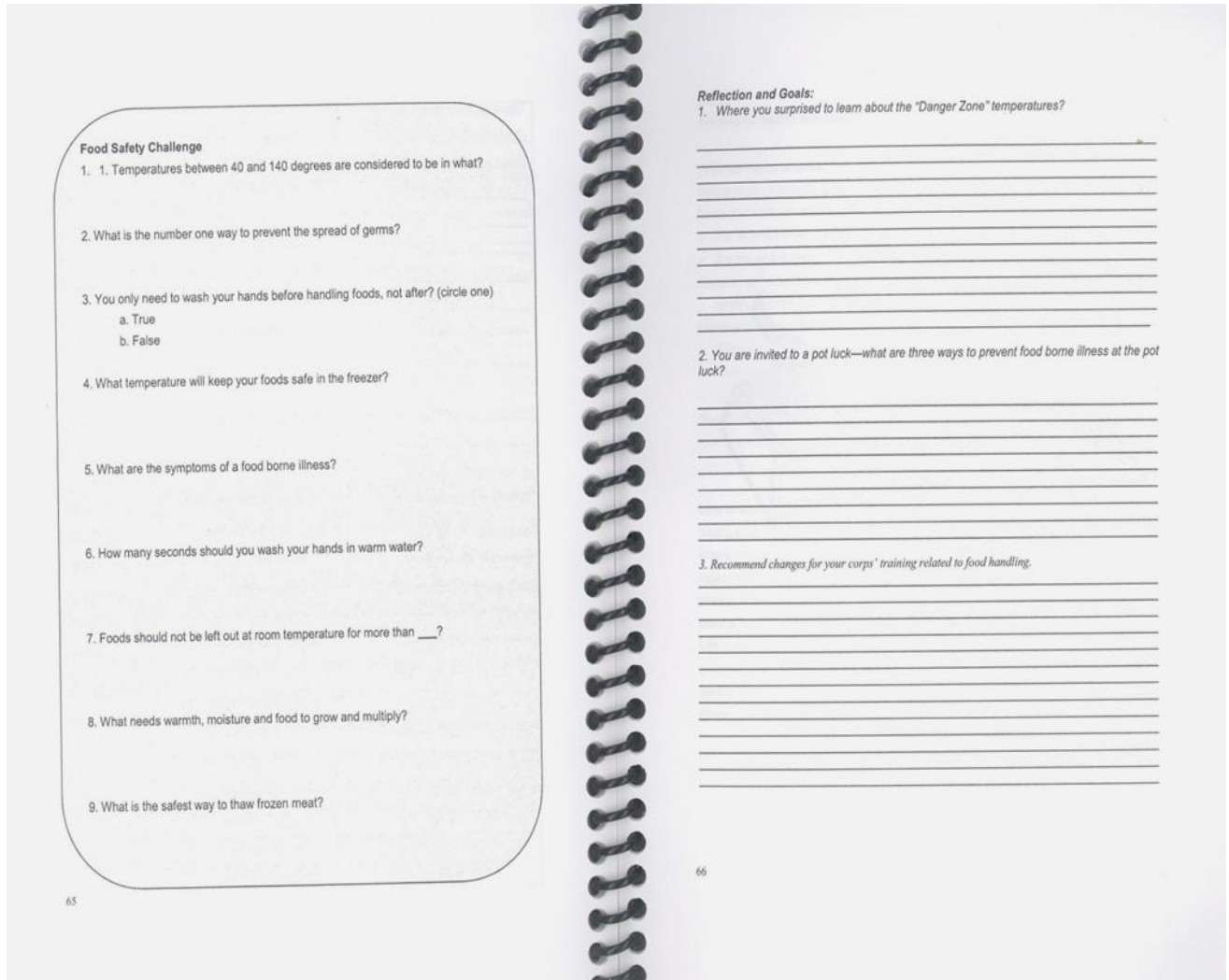
Barker, Janell

Includes: Approval is to continue study with the 207 participants already recruited. The above referenced project was approved by the Institutional Review Board with the condition that the attached consent form is signed by the subjects and each subject is given a copy of the form. NO changes may be made to this document without first obtaining the approval of the Committee. Subjects under the age of 18 years old must obtain parental permission.

Approval Period: November 20, 2009 through November 19, 2010
Review Type: EXPEDITED
IRB Number: 00000202
Funding: Colorado Health Foundation

Appendix B:

Sample #1 from Corps Member Guide



This is an example of the corps member guide. On the left is an activity where the corps members are asked to take a food safety quiz pertaining to the food safety content in unit 7. On the right an example of the reflection and goals section of the unit is represented.

Sample #2 From Corps Member Guide

Reading Food Labels and Ingredient Lists
Where do you find food labels and ingredient lists? _____

How to read a food label: _____

Nutrition Facts
Serving Size 1 cup (228g)
Servings Per Container 2

Amount Per Serving
Calories 250 **Calories from Fat 110**

% Daily Value*

Total Fat	12g	18%
Saturated Fat	3g	6%
Trans Fat	3g	
Cholesterol	30mg	10%
Sodium	470mg	20%
Total Carbohydrate	31g	10%
Dietary Fiber	0g	0%
Sugars	5g	
Protein	5g	
Vitamin A		4%
Vitamin C		2%
Calcium		20%
Iron		4%

* Percent Daily Values are based on a diet of other people's misdeeds.
Your Daily Values may be higher or lower depending on your calorie needs.

	Calories 2,000	2,500
Total Fat	Less than 65g	80g
Sat Fat	Less than 20g	25g
Cholesterol	Less than 300mg	300mg
Sodium	Less than 2,400mg	2,400mg
Total Carbohydrate	300g	375g
Dietary Fiber	25g	30g

The first item listed is servings size. It is important to look at serving size because this controls the rest of the amounts seen on the food label.

How many calories are in one serving of this item? _____
If you ate two cups of this item, how many calories would you be consuming? _____

After calories, you will see a list of nutrients. On the left side, you will see the amount (in grams or milligrams) of each nutrient. Remember, these values are for 1 serving.

On the right side, you will see a %DV, which stands for percent of daily value. This percentage is based on a _____-calorie per day diet; so if you need more calories than this, you would need more of each nutrient and vice versa. The %DV is a great tool to see if you are getting the right amount of each nutrient listed.

Fat and sugars are nutrients you will want to limit. This does not mean you should cut fat out completely. Your body needs some fat in your diet in order to function.

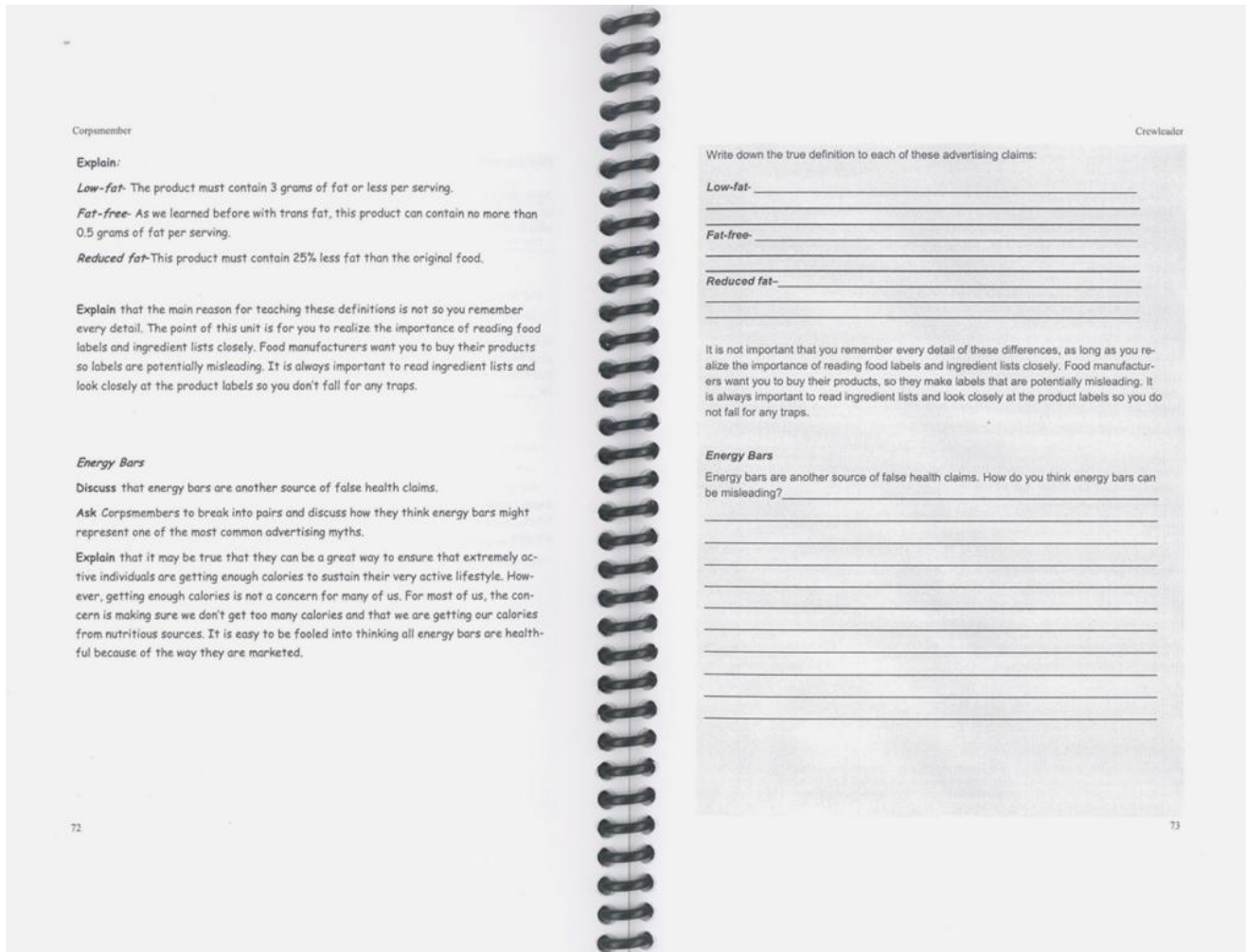
Carbohydrate is an important nutrient for _____, _____, and _____.

The vitamins and minerals listed are required for good health, all food labels must contain Vitamin A, Vitamin C, Calcium, and Iron because these are considered "indicator nutrients", which means _____.

Above is an example of the corps member guide. On the left there is a picture of a nutrition facts label and on the right there are several questions and fill in the blank sections pertaining to the nutrition facts label.

Appendix C:

Sample #1 From Crew Leader Guide



Above is an example of the crew leader guide on the left is the crew leader portion of the guide. This section is intended for the crew leader only and gives set instructions and information on teaching the content. On the right is the corps member guide that pertains to the content on the left that is taught by the crew leader.

Sample #2 From Crew Leader Guide

The image shows an open spiral-bound notebook. The left page is a feedback form titled "CREWLEADER FEEDBACK FOR UNIT 5". It includes sections for "Corpsmember" and "Crewleader". The form asks for feedback on the unit's flow, engagement, and suggestions for improvement. It also has fields for "Crewleader Name", "Corps", "Crew", and "Date". The page number "120" is visible at the bottom left. The right page features a large graphic of a tomato with a pencil inside it, symbolizing the connection between education and agriculture. The page number "121" is visible at the bottom right.

Corpsmember

CREWLEADER FEEDBACK FOR UNIT 5

Please complete and return to designated corps staff.

What is your overall impression of this unit? Does it flow? Any suggestions to improve flow?

How did Corpsmembers react to this unit? Did they find the topics interesting? Were they engaged?

What are some suggestions for improving this unit?

Any additional comments/questions?

Notes:

Crewleader Name: _____

Corps: _____

Crew: _____

Date: _____

120

Crewleader

121

Above is an example of the crew leader feedback section of the crew leader guide. This section was intended for qualitative feedback regarding the curriculum from the crew leaders.

Appendix D:

Below is the Survey for the curriculum. The pre and post survey contained the same questions. However, the post survey also contained an addendum which is located in appendix E.

Colorado Youth Corps Healthy Lifestyles

Directions:

This is **not** a test. This is a survey to find out about your experiences and opinions about nutrition, physical activity and access to health insurance. We will be asking you to take this survey again after you have completed the Colorado Youth Corps Healthy Lifestyles curriculum. Your answers will help us understand and improve healthy lifestyle programs for Colorado youth corps.

Please respond as honestly as possible, relying on your current feelings about the questions.

There are no right or wrong answers, only true answers for you. No one will know how *you* answered. Please do not put your name on the survey instrument. Your name will not be connected to your answers. Please complete all parts of the survey. If you feel uncomfortable answering any question, you may skip it and move to the next one. Your choice to complete the survey will not affect your participation in the program.

Thank you for your help.

Today's Date: _____

Your Gender: Male Female **Your Age:** _____

Your Ethnicity: *(Please check all that apply)*

- | | |
|---|---|
| <input type="checkbox"/> American Indian/Alaskan Native | <input type="checkbox"/> White/Caucasian (not of Hispanic origin) |
| <input type="checkbox"/> Asian/Asian American | <input type="checkbox"/> Hispanic/Latino |
| <input type="checkbox"/> Black/African American | <input type="checkbox"/> Mixed |
| <input type="checkbox"/> Native Hawaiian/Pacific Islander | <input type="checkbox"/> Other (please specify): _____ |

Your Crew: Day Overnight/camping

1. I am currently enrolled in a health insurance plan: (Check one)
<input type="checkbox"/> I don't know <input type="checkbox"/> Through my parents <input type="checkbox"/> Through my employer <input type="checkbox"/> By myself <input type="checkbox"/> Through a government sponsored program <input type="checkbox"/> I am not currently enrolled in a health insurance plan
2. Where does the majority of the food you eat come from (when you are <u>NOT</u> participating in the youth corps)? (Check one)
<input type="checkbox"/> Grocery store <input type="checkbox"/> Food bank <input type="checkbox"/> Fast food <input type="checkbox"/> Restaurants/take-out/delivery
3. When you eat fast food, how often do you "supersize" your meal? (Check one)
<input type="checkbox"/> I never eat fast food <input type="checkbox"/> Never <input type="checkbox"/> Not very often <input type="checkbox"/> Sometimes <input type="checkbox"/> Most of the time <input type="checkbox"/> Always
4. Approximately, how many of the meals you eat each week are prepared outside the home? (Check one)
<input type="checkbox"/> Zero <input type="checkbox"/> One <input type="checkbox"/> Two <input type="checkbox"/> Three <input type="checkbox"/> Four <input type="checkbox"/> Five <input type="checkbox"/> Six <input type="checkbox"/> Seven <input type="checkbox"/> Eight <input type="checkbox"/> Nine <input type="checkbox"/> Ten <input type="checkbox"/> Eleven <input type="checkbox"/> Twelve <input type="checkbox"/> Thirteen <input type="checkbox"/> More than thirteen
5. How many servings of fruits do you eat each day? (1 serving = 1 cup) (Check one)

<input type="checkbox"/> Zero <input type="checkbox"/> One <input type="checkbox"/> Two <input type="checkbox"/> Three <input type="checkbox"/> Four <input type="checkbox"/> Five <input type="checkbox"/> More than five
6. How many serving of vegetables do you eat each day? (1 serving = 1 cup) (Check One)
<input type="checkbox"/> Zero <input type="checkbox"/> One <input type="checkbox"/> Two <input type="checkbox"/> Three <input type="checkbox"/> Four <input type="checkbox"/> Five <input type="checkbox"/> More than five
7. Which of the following is <u>NOT</u> considered a major food group? (Check one)
<input type="checkbox"/> Meat (or meat alternatives) and beans <input type="checkbox"/> Milk/dairy <input type="checkbox"/> Fruit <input type="checkbox"/> Fats/oils/sweets <input type="checkbox"/> Vegetable <input type="checkbox"/> Grains
8. Food labels use _____ calories as the reference. (Check one)
<input type="checkbox"/> 1,000 <input type="checkbox"/> 1,500 <input type="checkbox"/> 2,000 <input type="checkbox"/> 3,000 <input type="checkbox"/> Not sure
9. One serving of cheese is equivalent to: (Check one)
<input type="checkbox"/> One handful <input type="checkbox"/> The size of your thumb <input type="checkbox"/> The size of a deck of cards <input type="checkbox"/> The size of a tennis ball <input type="checkbox"/> Any amount you are served
10. Which of the following is <u>NOT</u> considered a healthy cooking method? (Check one)
<input type="checkbox"/> Grilling <input type="checkbox"/> Baking <input type="checkbox"/> Frying <input type="checkbox"/> Steaming <input type="checkbox"/> Broiling
11. The unit price of a food item in a store is based on the _____ of the item. (Check one)

<input type="checkbox"/> Size <input type="checkbox"/> Weight <input type="checkbox"/> Brand <input type="checkbox"/> Quality
12. According to the plate method, how much of your plate should be filled with vegetables? (Check one)
<input type="checkbox"/> 1/4 <input type="checkbox"/> 1/3 <input type="checkbox"/> 1/2 <input type="checkbox"/> 3/4

13. Which is the best definition of health insurance? (Check one)
<input type="checkbox"/> Health insurance is coverage that compensates the insured for expense or loss incurred for medical reasons. This coverage provides for the payment of medical bills as a result of preventative care, sickness, injury or for hospitalizations. <input type="checkbox"/> Health insurance is a special savings account in which monthly deposits are made. Medical bills that result from preventative care doctor's visits, sickness, injury or hospitalizations are paid for using the debit card account. <input type="checkbox"/> Health insurance is a fund that is set up by employers to pay for injuries or sickness that may affect an employee's job performance. <input type="checkbox"/> Health insurance is a part of the Executive branch of the federal government, which allocates tax dollars to reimburse citizens for medical expenses at the end of each year.
14. Which of the following are ways to access health insurance coverage? (Check one)
<input type="checkbox"/> Privately, purchase on your own <input type="checkbox"/> Through the health coverage plan purchased by your employer (or in some cases, groups of employers) <input type="checkbox"/> Through state offices and/or social services <input type="checkbox"/> All of the above

Thank you for your feedback!

Appendix E: Addendum to the curriculum which was included for corps member feedback.

15. Using the scale below how did you like the Healthy Lifestyles program? (Check one)					
<input type="checkbox"/> Did not like it at all <input type="checkbox"/> Liked it a little <input type="checkbox"/> Liked some of it <input type="checkbox"/> Liked most of it <input type="checkbox"/> Liked all of it					
16. On a scale from 1 to 5, how would you rate each of the units? (Check one box for each unit.)					
	1 not helpful	2 a little helpful	3 somewha t helpful	4 mostly helpful	5 extremel y helpful
Unit 1: Importance of a Healthy Lifestyle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unit 2: Tools for Success: Reading Food Labels and Ingredient Lists	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unit 3: How to Avoid Marketing Traps	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unit 4: Eat Smart! Making Healthier Choices When You're On-the-go	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unit 5: Eat Well for Less!	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unit 6: Healthful Meals, Quick!	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unit 7: Keep Your Food Safe!	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unit 8: Access to Health Insurance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Trivia Game	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

17. What other topics related to a healthy lifestyle would you have liked to learn more about?

--

18. Is there anything else you would like to tell us?

--

Thank you for your feedback! ☺

Appendix F: Results When Re-analyzing Data for Ages 20 Years and Under

Behavior Questions for Data on Corps Members Age 20 years and under: Within Subjects Contrast- Difference in Group Behavior Score between Pre and Post Survey

	Group Time Effect
Question 3: Supersized	.693
Question 4: meals outside of home	.569
Question 5: Fruit Servings	.144
Question 6: Vegetable Servings	.597

Behavior Questions for Data on Corps Members Age 20 Years and Under: Between Subject Contrast-Difference if Behavior Score Between Control Group and Implementation Group

	Group effect ages 20 years and under
Question 3: Supersized	.079
Question 4: meals outside of home	.001*
Question 5: Fruits Servings	.527
Question 6: Vegetable Servings	.976

*There was a significant difference between control and implementation group for question 4, however there was also a significant difference also reported for all ages.

Appendix G

Quantitative Results for the *Healthy Lifestyle Curriculum* for ages 20 and under

Within Subjects Effects-Difference between groups in knowledge score from pre-to post-Survey

Question	Time effect	Group Time effect
Question 7 MyPyramid	.208	.208
Question 8 Food Label	.049*	.741
Question 9 Cheese Serving	.039*	.849
Question 10 Healthy Cooking Method	.884	.414
Question 11 Unit Price	.387	.387
Question 12 Plate Method	.001*	.367
Question 13 Definition HI	.918	.564
Question 14 Access to HI	.635	.635

*The time effect indicates a difference between pre and post survey but when comparing groups there was no significant difference.

HI=Health Insurance

Between Subjects Effects- Difference in Knowledge Score Between Control Group and Implementation for ages 20 years and under

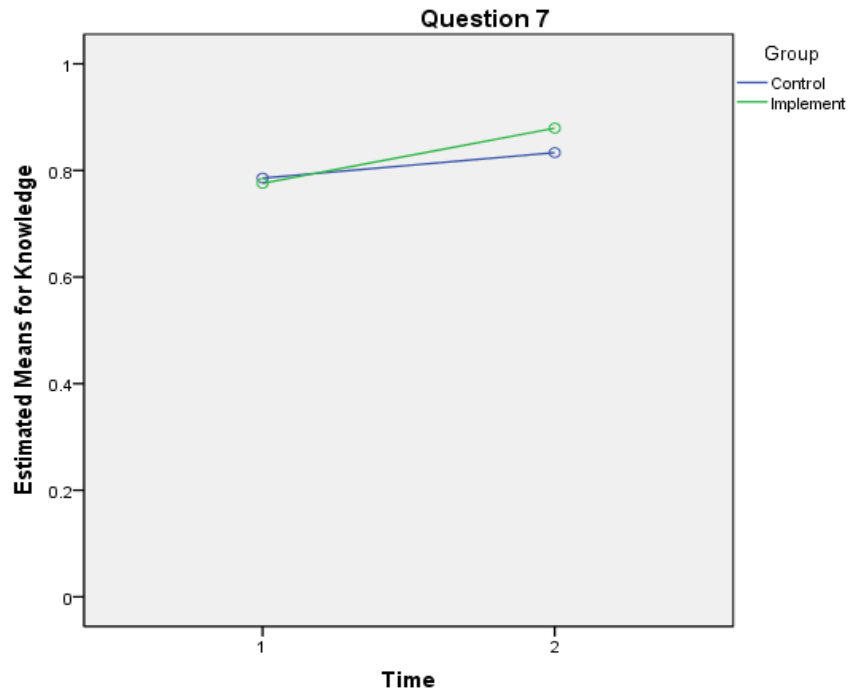
Question	Group effect
Question 7 MyPyramid	.791
Question 8 Food Label	.800
Question 9 Cheese Serving	.002*
Question 10 Health Cooking Method	.616
Question 11 Unit Price	.671
Question 12 Plate Method	.066
Question 13 Definition HI	.745
Question 14 Access to HI	.926

*Question 9 had a significant group effect, which indicates there was significant difference in mean knowledge scores between the control and implementation group. There was also a significant group effect for all ages (significance of .008).

HI=Health Insurance

Appendix H: Figures for Additional Knowledge Questions

Figure for Question 7 Regarding the Food Guide Pyramid



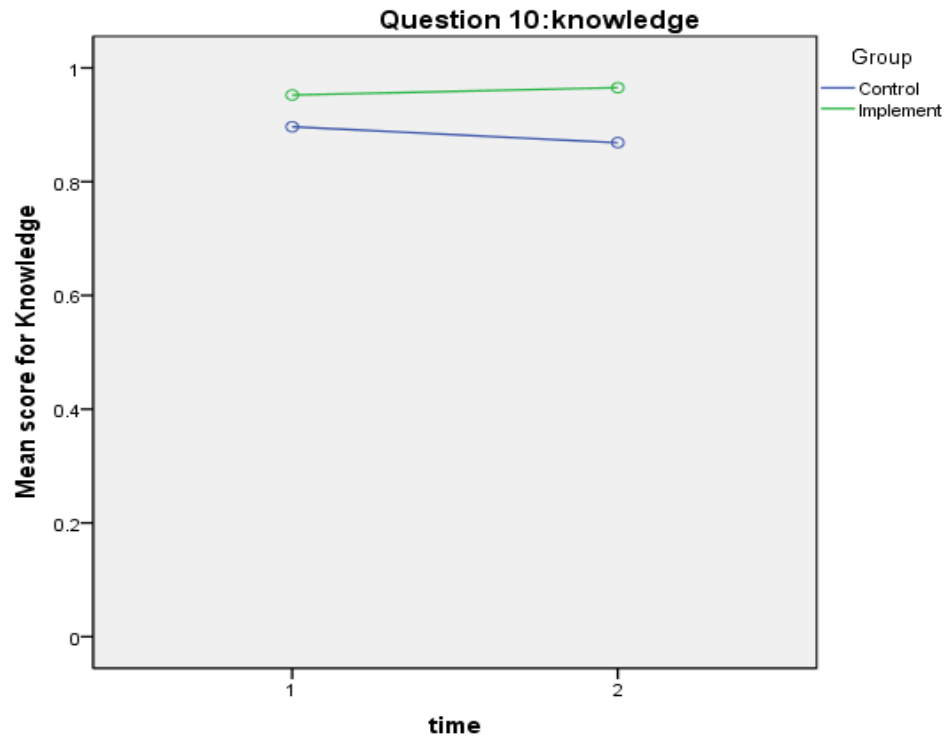
The above figure represents the mean knowledge score of all the participants comparing both the implementation group (in green) and the control group (blue). Time point 1 represents the pre-survey and time point two represents the post survey. The mean knowledge score for both the control and implement group was approximately .775 for the pre survey. The knowledge score for the implementation and the control group increased to .84 and .81 in the post survey respectively. There was no significance, however, between time points and between groups.

Figure for Question 8 regarding Food Labels



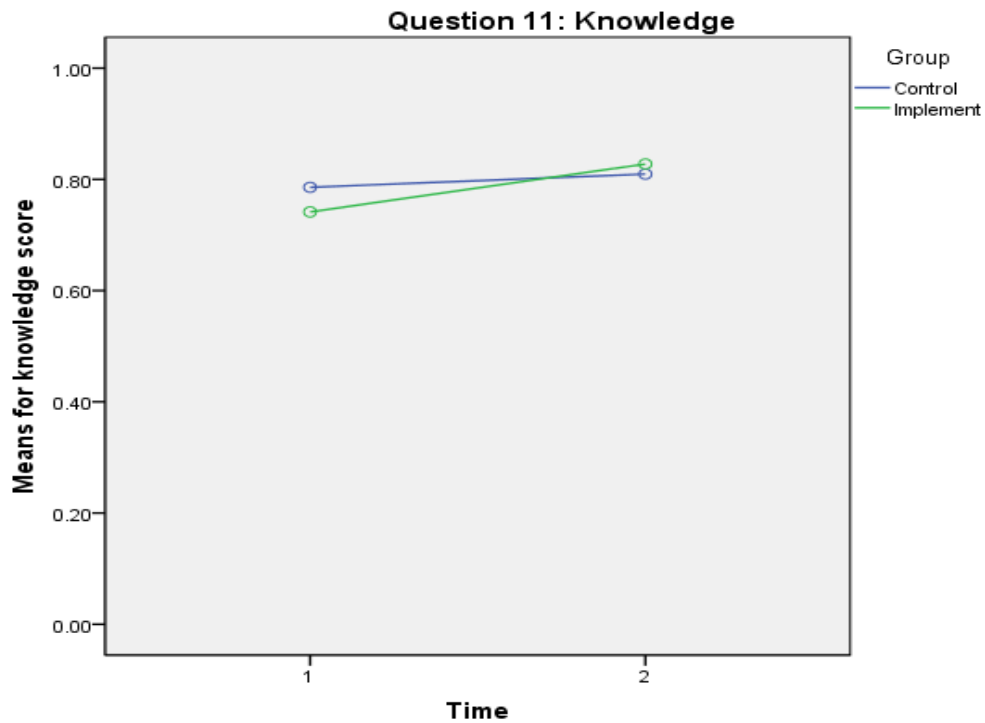
The pre-survey mean knowledge score for implementation group and control group were .65 and .57 respectively. Both implementation group and control group showed an increase in knowledge score at approximately the same rate. The post survey mean knowledge score for implementation group and control group were .77 and .7 respectively. There was no significant time effect on either group nor was there a significant difference between groups because they increased at approximately the same rate. The control group would have been predicted to show no increase in knowledge. These results could indicate that the control group increased knowledge of this subject between pre and post survey independent of the implementation of the curriculum.

Figure for Question 10 regarding Health Cooking Methods



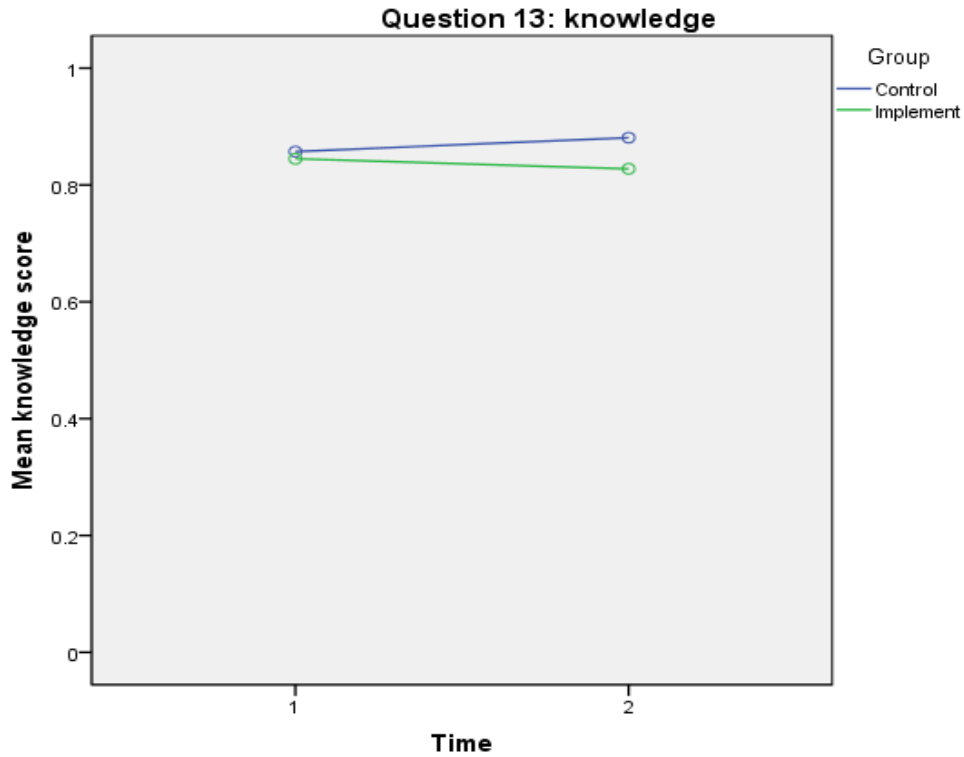
For the pre survey, the mean knowledge score for the implantation and control group were .95 and .88 respectively. This high knowledge score indicates that approximately 90% of all participants got the answer correct in the first survey and there was no significant increase in knowledge score between pre and post survey. The reason that there was no significant could be due to a ceiling effect which means there was no room for improvement.

Figure for Question 11 Regarding Unit Price



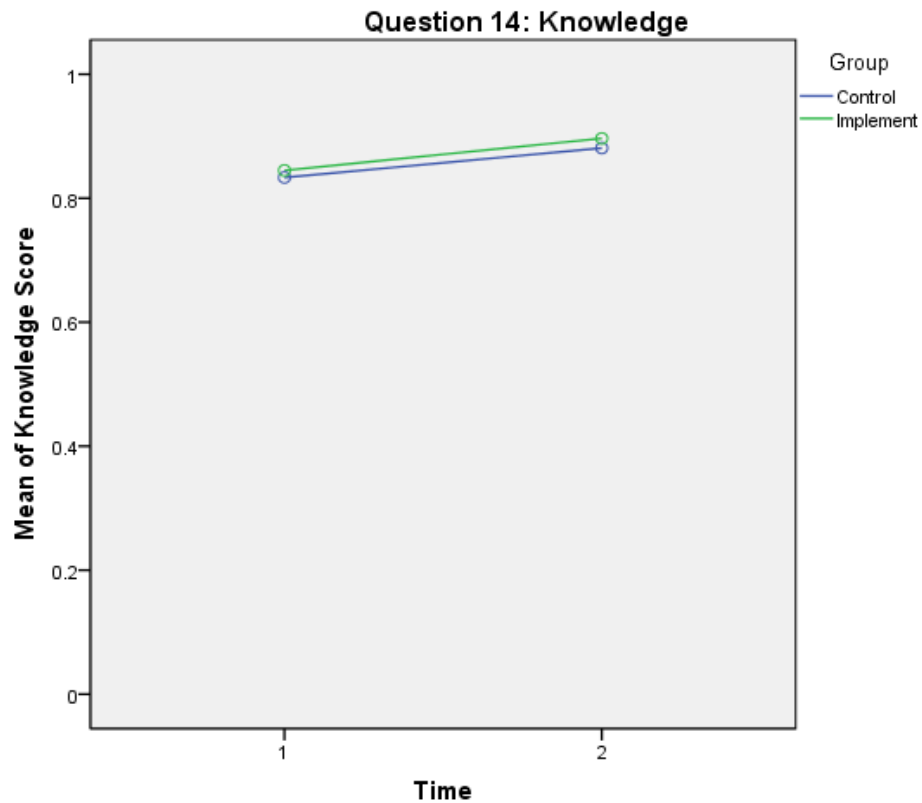
The pre-survey mean knowledge score for the implementation and control group were .75 and .8 respectively. The knowledge score did not increase significantly for the control group and the implementation group increased to .81, which was also not statistically significant. This question also appears to have a ceiling effect because approximately 80% of the participants knew the correct answer, which leaves no room for improvement.

Figure for Question 13 Regarding the Definition of Health Insurance



The pre-survey mean knowledge score for implementation and control groups was .85 and .856 respectively. The knowledge score did not increase significantly for both group and the implementation group went down slightly. These results could also be due to a ceiling effect in which approximately 85% of the participants know the correct answer in the pre survey which would mean there was no room for a significant improvement in knowledge.

Figure for Question 14 Regarding Access to Health Insurance



The pre survey for both implementation and control was approximately .85 and the post survey score was approximately .9 for both groups. There is no significant between the two groups nor was there a significant time effect and knowledge did not increase a significant amount between pre and post survey between groups or within groups. This could be due to a ceiling effect because over 80% of all participants in both control and implementation group got the answer correct in the pre-survey leaving no room for improvement.

