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Effectiveness of Two Various Types of School-based Instruction Methods in Relation to BMI, Physical Activity, and Nutrition Outcomes

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Research Proposal Paper

Effectiveness of Two Various Types of School-based Instruction Methods in Relation to BMI,
Physical Activity, and Nutrition Outcomes

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&

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A Paper to Meet Partial Requirements

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Southern Adventist University

Introduction

Childhood obesity has been established as a major contributing factor in the early onset of many health disparities, including adult obesity, type 2 diabetes, and hypertension (Boles, Johnson-Shelton, & Moreno, 2013, p.158). Childhood obesity is defined as having a body mass index (BMI) of greater than or equal to the 95th percentile for children of the same age and gender (Boles, Johnson-Shelton, & Moreno, 2013, p.158). As of 2012, the national childhood obesity rates had raised to approximately 18% in U.S. children aged six to eleven (Ogden, Carroll, Kit, & Flegal, 2014, p.808). In response to these findings, many school-based programs have been implemented in attempts to reduce the overall percentage of obese children and their likelihood of developing preventable health disparities, such as the aforementioned, in addition to teaching healthy lifestyles at an early age.

Purpose

School-based obesity prevention initiatives have gained popularity in recent years and act as an effective means of helping to decrease the prevalence of obesity amongst children in the United States (Mohan, Smith, Corriveau, Kline-Rogers, Jackson, Eagle, Godberg & DuRussel-Weston). With many of these programs in place, it is important to understand which program methods are most effective; those taught by verbal instruction alone or those based upon teachers and school staff modeling diet and exercise behaviors. Our study aims to compare the results of weight loss, physical activity, and nutrition outcomes in students modeling behaviors after their teachers' diets and exercise-related behaviors versus those students who were only given verbal instructions about diet and exercise recommendations.

Theoretical Framework

Bandura's Social Learning Theory states that people learn by observing the behavior of others and model their own behavior based upon their observations (Brauer & Tittle, 2012, p.158). This theory is the framework used for the basis of our research. Most children in the United States aged six to twelve share basic influencing factors such as teachers, peers, family members and the media. The influencing factors that our study focuses on are the teachers and other school staff. The outcomes of interest are BMI changes, physical activity changes, and nutrition changes in this population. The variable factor being researched is verbal instruction versus modeled behavior in relation to diet and exercise behaviors.

Literature Review

Current research articles concerning childhood obesity prevention and improvement programs in children aged six to twelve were retrieved from the following databases: CINAHL, MEDLINE, and Pubmed.

The Key search terms used throughout the research process were: *childhood obesity, health promotion, role model, demonstration, verbal instruction, physical activity, nutrition, and school-based.*

Journal articles reviewed were peer-reviewed articles and were published within the last five years. Each of the studies reviewed made use of different experimental designs. Logistic regression, paired two-sample t-test, two-level multi-level modeling, quasi-experimental, and meta-analysis experimental designs were each observed within the studies reviewed.

School-based obesity prevention and health- promotion programs have proven successful at lowering participant's BMIs, increasing their level of physical activity (PA), and increasing the amount of healthy foods they consume.

Outcomes in regard to BMI

Many of the studies in the literature had significant findings in relation to a decrease in the BMIs for children involved in a school-based obesity prevention program, with one study having non-significant findings. There is a lack in published studies pertaining to school-based obesity prevention programs taught only by verbal instruction alone. The only published studies found are those based on programs that have used a combination of verbal instruction and modeled behaviors to implement school-based obesity prevention programs. Of these programs, the use of BMI measurements is a common assessment tool in reporting success or failure of each program and the use of β to represent the intervention effect. Fairclough, Hackett, Davies, Gobbi, Mackintosh, Warburton, and Boddy found a significant reduction in BMI z-scores in their study of the CHANGE! intervention, having a 95% confidence intervals and $\beta = -0.24$ cm. Boles, Johnson-Shelton, and Moreno's study was significant with decreased BMIs amongst children aged six to twelve years. With a 95% confidence interval and a change of 4.7%, this study was of low magnitude in regards to a change in BMI status. However, it should be noted that this study did see a greater reduction in BMIs when physical activity and nutrition were changed in combination with school staff involvement. Vasques, Magalhães, Cortinhas, Mota, Leitão, and Lopes showed a positive effect on BMIs in relation to the children who participated in their study when physical activity, nutrition, and modeled behavior were involved, with a 95% confidence interval and a change of 6.8%. The only non-significant findings within the literature reviewed was that of Burke, Meyer, Allensworth, and Gazmararian, showing a mean change in BMIs of 16% using the PACER performance test and the HealthMPowers instrument to study teacher involvement. Hertbert, Lohrmann, Seo, Stright, and Kolbe found significance with the consumption and elimination of certain foods in conjunction with an exercise regimen, with a 95% confidence interval and a BMI

change of 3.4%; it was not revealed if the school staff modeled the nutritional behaviors set upon the students.

To give an example of the effectiveness of verbal-only instruction, Friedman, Cosby, Boyko, Hatton-Bauer, & Turnbull conducted a study regarding effective teaching methods for patient education. Their findings showed verbal teaching to be the least effective strategy, with a 95% confidence interval and 1.9 to 3.7% for verbal teaching compared to routine care (Friedman, Cosby, Boyko, Hatton-Bauer, & Turnbull, 2010).

While various methods of completing such programs have been used, there has been limited research completed comparing the effectiveness of verbal-only program methods to programs, which use school-staff role-modeling methods. A head-to-head comparison study of the two methods would provide researchers with data to support the use of one program methodology above the other type.

Outcomes in regard to physical activity levels

The Energize program (taught via verbal instruction) did not prove effective in increasing physical activity levels (Herbert, et. al, 2013) while the CHANGE! program proved to have a significant intervention effect on light intensity PA ($\beta=25.97$ (95% CI= 8.04, 43.89) min, $p=0.01$ (Fairclough, et al., 2013). The SPARK program which uses primarily verbal-based instructional methods proved to be effective at increasing moderate to vigorous physical activity (MVPA) when used during the school day, but proved ineffective at causing a significant change when used afterschool (Herrick, et. al, 2012). In a research experiment by Smuka et. al. (2013) teacher role modeling was used and results showed statistically significant ($p<0.05$) changes in the number of students engaging in PA “very often” by 13% and the number of those engaging in PA “often” by 17%.

Outcomes in regard to nutrition

The Energize program (taught via verbal instruction) proved effective at decreasing the amount of chips and French fries eaten by adolescent study participants (Herbert, et. al, 2013). The CHANGE! program also added findings in support of nutrition and PA combination programs resulting in positive weight-loss and health improvement outcomes (Fairclough, et al., 2013). Limited data is available about the statistical significance and CI of school-based health promotion programs in relationship to nutrition outcomes. Further research would be beneficial for increasing knowledge on this subject.

Hypothesis

Any initiative toward preventing childhood obesity or making steps toward improvements in current childhood obesity rates is a positive objective, however, limited research has been conducted comparing weight loss outcomes of students whose teachers physically modeled diet and exercise behaviors versus students who were only given verbal instructions in regards to diet and exercise changes. Researchers hypothesize that children modeling the behaviors of their teachers and school staff will have more significant outcomes than those acting upon verbal instructions alone.

Methods**Study Design and Population Sample**

This project is a quasi-experimental, nonequivalent, control group, pretest-posttest design. This study is designed to compare the efficacy of two instructional methods (verbal instruction only vs. role modeling behavior) of school-based obesity prevention and improvement programs.

A convenience sample of male and female children, attending six local schools, aged six to twelve years of age, without ethnic exclusion, will be voluntarily selected after parental informed consent is given for study participation.

Inclusion criteria

Participants must be physically capable of participating in physical activity, mentally intact and of comparable intellect to their peers, and will have parental consent prior to the study.

Exclusion criteria

The study will exclude any children who are home-schooled, absent on measurement collection days, or not meeting any of the above criteria.

Participation in the study will be voluntary and there will not be monetary or any other incentives to participate. Parents of participants will be allowed to opt their child out of the study at any point and will not suffer any consequences if they choose to do so.

Ethics

In order to respect human dignity, a full intervention protocol and informed consent will be submitted to the Southern Adventist University (SAU) Institutional Review Board for approval. This study will be independent, impartial, and will evoke no harm on any study participants. Additionally, to assure the protection of the participants and provide transparency of study procedures, all participants will be asked to have their parents sign an informed consent form (ICF) prior to participating in the study (see Appendix A). Participants' identity will be kept anonymous by assignment of a generic numeric identification (ID) code.

Instrumentation and Operational Definitions

BMI

BMI is calculated by taking the participants' weight in pounds divided by height in inches squared and multiplied by 703 (Carroll-Scott, Gilstad-Hayden, Rosenthal, Peters, McCaslin, Joyce, & Ickovics, 2013). Height and weight measurements will be taken on all participants while they are wearing socks and light athletic clothing. Height will be measured to the nearest 0.01 inch using a stationary measuring tool. Weight will be measured to the nearest 0.01 pound with use of a digital scale.

Our study uses parental surveys, BMI calculations, and comparative analysis. The dependent variable BMI is a popular obesity evaluation tool. BMI is one of our chosen outcome measures because BMI has proven effective in correlating body fat in children and adolescents (Vasques et. al, 2014). BMI is an outcome measure that is frequently used to classify children and young people into normal-weight, and overweight categories (Vasques et. al, 2014).

Physical Activity

PA levels will be measured by through the collection of data submitted via parental questionnaire responses. Physical activity is self-defined by this study as any activity performed that raises the heart rate for at least three minutes. Data will be quantitative and will be measured in minutes of daily exercise. Examples of physical activity include but are not limited to: running, bike riding, swimming, playing organized sports, jump roping, speed walking, and roller-blading.

The number of minutes of daily exercise determined by the pre-test questionnaire results will be directly compared to the number of minutes of daily exercise determined through the post-test results, through use of SPSS paired t-test analysis.

Nutrition

Nutrition levels will be measured by through the collection of data submitted via parental questionnaire responses. Data will be quantitative and will be measured in daily number of servings of fruits and vegetables. One serving of fruit will be defined as one and one half cup of fruit daily. One serving of vegetables will be defined as two cups daily. Daily serving definitions and recommendations are self-designed by this study based upon similar current recommendations by choosemyplate.gov. Our program's focus will be on increasing the amount of daily fruits and vegetables consumed in addition to reducing consumption of refined sugars, fried foods, fast-food, and processed foods.

Procedure

The participants will be divided into two groups dependent upon which school they attend. Three schools will use a program designed to use verbal instruction only, while the second group of participants from the remaining three schools will make use of the program that is designed to use role-modeling instruction methods.

At the beginning of the study informed consent for inclusion forms (see Appendix A) will be sent home with all applicable students at the bottom of the consent form a brief five-question survey about the child's current PA and dietary habits will be included. The form will also include information about study procedures and objectives. After one week all participants who have obtained parental consent will be assigned an appointment time with the school nurse during which time their pre-study BMI will be recorded.

For three months the two instruction methods of interest will be applied in the participating schools. Three schools will use verbal-only instruction methodology while the remaining three schools use role-modeling techniques.

At the conclusion of the three-month trial period appointments will again be made for each participant to be evaluated by the school nurse. Post-study BMIs will be collected and compared to the original findings. An additional three-item questionnaire will be sent home with participants and returned to school within one week so that post-test outcomes pertaining to nutrition and physical activity can also be evaluated for any changes.

See figure 1a. in the appendix for a full study timeline.

Data Collection

After approval from SAU's IRB is obtained local schools will be contacted via telephone to determine which schools are willing to participate. Once participating schools have been chosen and have accepted participation criteria, a mailed package of program procedures and instructions will be compiled and mailed to participating schools.

As outlined in figure 1a, our study schedule has been systematically outlined over the course of four months. In January, ICFs will be sent out and recollected, a list of participants will be compiled, ID numbers will be assigned, and the school nurses will calculate participants' pre-study BMIs. The programs will begin on February 1st and will continue through May 1st. During the first week of May, post-study BMIs will be calculated by the school nurses and five-question post-study questionnaires will be sent home to parents and returned to the school for collection. By the end of the first week of May all results will be collected, compiled, compared, contrasted, and written up. By the end of May, research results will be sent out to participants' parents and submitted for publishing.

Data Analysis

Our study examines the nonlinear relationship between the dependent variables (BMI, nutrition, and PA levels) and independent variables (program instruction method: verbal vs. role-

modeling.) Similar relationships have been studied in previous research but no studies have compared these specific variables.

Data analysis will be performed using various methods as outlined below. IBM SPSS version 22.0 will be used to run comparative tests on data results. For baseline group comparisons, nominal data differences (such as differences between male and female outcomes) will be tested by chi-square and 2-tailed t-tests will be performed to compare all interval/ratio data (such as BMI results pre-test and post-test.) Before performing 2-tailed t-tests researchers will check the variables for normal distribution to ensure that this test is appropriate, if the distribution is nonparametric alternative testing such as Mann Whitney U will be used.

Nested t-tests will be conducted to assess the differences between the two instruction methods applied at the various schools, employing a 0.05 level of significance and with adjustment of standard errors to account for stratification, clustering, and variability that will result from the study's design. Analyses will be performed using SPSS's Complex Sample Module, a statistical software package.

The number of fruits and vegetables consumed daily determined by the pre-test questionnaire will be directly compared to the number of fruits and vegetables consumed daily determined through the post-test questionnaire through use of SPSS paired t-test analysis, as will the pre-test and post-test data about weekly fast-food and fried food intake.

Discussion

Limitations

Limitations exist within our study. Parental consent may not be obtained for as many participants as our study is aiming for (2000 participants). The survey results include qualitative data, which results in data that is more difficult to compile, calculate, and compare than quantitative

data. More specific questions may result in higher quality study observations, such as “what fruits and vegetables have your child eaten over the past 24 hours?” and “what physical activities have your child participated in over the past 24 hours and for how many minutes each activity?” Our study also uses quantitative data including participants’ BMI results.

Limitations pertaining to this data include lack of reliability in parental responses. Further studies could include more reliable measures such as use of the System for Observing Fitness Instruction Time (SOFIT) which is a direct observation tool that has been previously validated for use in assessing children’s PA level (Schuna, Lauersdorf, Behrens, Liguori, & Liebert, 2013). The decision to use a simple five-question survey rather than other methods was based upon knowledge that parents will be more likely to fill out a survey if it is brief, clear, and precise.

Limitations pertaining to this data include lack of reliability in parental responses. Future studies could use more reliable data collection methods such as the Student Health Assessment Questionnaire (SHAQ) to measure dietary and activity levels in children. The SHAQ tool has been used previously in the Healthy, Energetic, Ready, Outstanding, Enthusiastic, Schools (HEROES) program (Herbert, Lohrmann, Seo, Stright, & Kolbe, (2013). The decision to use a simple three-question survey rather than other methods was based upon knowledge that parents will be more likely to fill out a survey if it is brief, clear, and precise.

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Appendix A

Informed Consent Letter Sent to Parents

Informed Consent Form Letter

Dear Parents,

Your child has the opportunity to be involved in a research project aimed at determining the most effective method of instruction of school-based health promotion programs.

The study will be conducted at your child's school over a four-month period. During this time your child's Body Mass Index (BMI) will be measured and recorded by the school nurse prior to the program's start and after the program's end. Pre-program results will be compared to post-program results.

Your child's identity will be kept anonymous by assigning them a generic ID number at the beginning of the program.

Study participants will learn information about healthy eating habits, the importance of physical activity, and will be involved in school-based health promotion curriculum conducted during school hours.

By signing below you indicate your consent for your child's participation within this health promotion program and consent for their results to be used within this ongoing research project. Participation in the study is entirely voluntary and you may opt out at any time without consequence.

Child's Name _____

Parental Consent (Signature) _____ Date _____

OR

I choose to withhold consent for my child to participate in this program and research project.

Parental signature of refusal _____

Date _____

For those allowing their child to participate in the research study, please answer the following 3 questions prior to returning this form to the school. Please return this form to the school within the next 3 days.

1. How many minutes of exercise (physical activity) does your child typically get on a daily basis?

(Physical activity: any activity performed that raises the heart rate for at least three minutes, examples of physical activity include but are not limited to: running, bike riding, swimming, playing organized sports, jump roping, speed walking, and roller-blading.)

2. How many servings of fruit does your child eat get on a daily basis?

(Daily serving of fruit: 1.5 cups of any fruit)

3. How many servings of vegetables does your child eat get on a daily basis?

(Daily serving of vegetables: 2 cups of any vegetable)

4. How many times per week does your child eat food from fast food restaurants?

Child Assent Form

We are graduate students at Southern Adventist University's Family Nurse Practitioner program. We are curious about the effectiveness of two various types of school-based instruction methods in relation to BMI, physical activity, and nutrition outcomes

. We are doing a study on students aged 6-12 years who are able to participate in a study that involves physical exercise and nutritional changes.

We will write down all of the information obtained during this study to determine if you learned better and increased your health from verbal instruction or from modeled behavior. After we present this information at our own school, all of your personal information will be destroyed and it will not be shared with anyone else. At no time during this study will your personal information be shared with any of your peers.

Here are some things we'd like you to know:

- You do not have to be in the study. You will not be in trouble for refusing to be in the study.
- Even if you start the study, you may quit at any time if you truly want.
- We asked your parents if you could be in our study. Even if they said that you could be in our study, you can still choose not to be in it.
- If you want to talk to one of us about the study while we are not here at your school or if you have any other questions, you can email us at one of the following email addresses: sherrie@southern.edu or emoorejones@southern.edu. We will reply and answer your questions as soon as possible!

If you understand what you would be doing in our study, and if you want to participate, sign your name on the line below.

Your Signature Date

Researcher Signature Date

Post-Test Outcomes Form

Your Child's Study ID # (will be filled out prior to being sent home with each participant)

1. How many minutes of exercise (physical activity) does your child typically get on a daily basis?

(Physical activity: any activity performed that raises the heart rate for at least three minutes, examples of physical activity include but are not limited to: running, bike riding, swimming, playing organized sports, jump roping, speed walking, and roller-blading.)

2. How many servings of fruit does your child eat get on a daily basis?

(Daily serving of fruit: 1.5 cups of any fruit)

3. How many servings of vegetables does your child eat get on a daily basis?

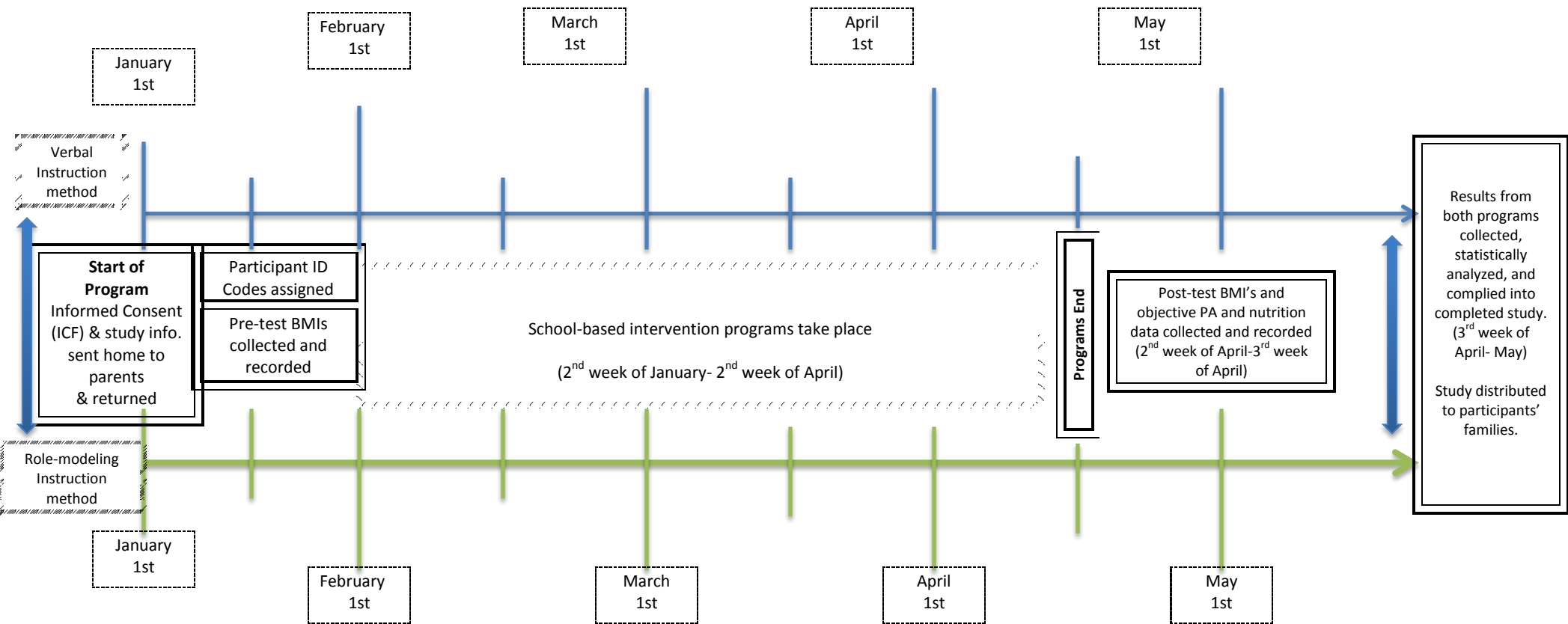
(Daily serving of vegetables: 2 cups of any vegetable)

4. How many times per week does your child eat food from fast food restaurants?

5. How many times per week does your child eat fried food?

Please return this questionnaire to the school within the next 3 days so that results can be collected and used to draw comparisons to the pre-study information that you submitted. Study results will be available to you by the end of the summer.

Fig. 1a



Matrix

First four by Sherri Bakland
Second four by Elizabeth Moore-Jones

Reference & Level of evidence	Problem, Purpose, & Hypothesis	Design & Population Sample	Independent & Dependent Variables	Measures & Operational Definitions	Outcomes & Findings
<p>Boles, S., Johnson-Shelton, D., & Moreno, G. (2013). Prevalence and prediction of overweight and obesity among elementary school students. <i>Journal Of School Health</i>, (3), 157.</p> <p>The level of evidence presented within this paper was level 2 data. The data was obtained through a single in-depth quantitative study evaluating for program effectiveness through evaluation of quantitative data.</p>	<p>The study states that little is known about the factors that contribute to the distribution of overweight and obese children within school districts.</p> <p>The purpose of the study was to measure the BMIs of elementary school children over the course of 5 years and to compare outcomes</p>	<p>The data collected was analyzed by using the Epi Infor (CDC, Atlanta, GA) analysis tool, NutSat, a nutrition anthropometry program that calculates BMI. These programs calculated the raw BMI, z-score, and percentile equivalents. The 2 groups were then divided into two groups. One group included studneths <85th percentile BMI and the other group include> and equal</p>	<p>The independent variables were the Community and Schools Together for Childhood Obesity Prevention project (CAST) which was a community-based childhood obesity study which took place over 5 years.</p> <p>The dependent variable was the BMI of each child that participated in the program. The BMI was affected in part by the child's participation within the program. BMI</p>	<p>The measures used in this study were the Epi Info analysis tool and the NutSat anthropometry program, which were used to calculate BMI, z-score, and percentile equivalents.</p> <p>The operational definitions found within this article were BMI, weight, height, overweight, and obesity.</p> <p>BMI is defined as Body Mass Index.</p> <p>Weight was obtained with a portable digital scale. The study did not define if weight was measured to the nearest pound or more specifically.</p>	<p>The study found the following percentage of children to be overweight in each grade respectively: K: 30.9% 1st: 34.4% 2nd: 35.3% 3rd: 36.4% 4th: 37.1 % 5th: 44.5%</p> <p>The study also found that ethnicity was the strongest predictor of inclusion in the overweight ($\geq 85^{\text{th}}$ percentile) category, with Hispanics being the highest percentage of overweight children.</p>

	<p>amongst schools within an Oregon school district.</p> <p>The hypothesis of the study is that there would be variation among schools and that factors that contribute to obesity and being overweight would also vary.</p>	<p>to 85th percentile. A generalized mixed modeling approach was used to construct a binomial model with nesting within the school. Logistic regression was used to examine potential predictors of overweight and obesity.</p> <p>2317 students in grades K-5 from within seven elementary schools that are a part of 1 school district in Oregon participated in the study.</p> <p>The study excluded children that were homeschooled, absent on days when measurements were taken, and mentally or physically handicapped.</p>	<p>depends on the child's height and weight.</p>	<p>Height was obtained by 2 research assistants using a portable child-adult measuring stadiometer board with inch-foot measuring tape and auto head lock. Any measures that varied by more than 0.25 inches were recollected.</p> <p>Overweight was defined as having a BMI of $\geq 85^{\text{th}}$ percentile for children of the same age and gender.</p> <p>Obesity was defined as having a BMI of $\geq 95^{\text{th}}$ percentile for children of the same age and gender.</p>	
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<p>Burke, R. M., Meyer, A., Kay, C., Allensworth, D., & Gazmararian, J. A. (2014). A holistic school-based intervention for improving health-related knowledge, body composition, and fitness in elementary school students: an evaluation of the HealthMPowers program. <i>International Journal Of Behavioral Nutrition & Physical Activity</i>, 11(1), 1-26. doi:10.1186/1479-5868-11-78</p> <p>The level of evidence represented in this study is level 1 data.</p>	<p>The problem presented by this study was the gap in the research about the effectiveness of the HealthMPowers program.</p> <p>The purpose of this study was to study the effectiveness of the program in improving the school environment, behavior of students, student knowledge, BMI, and cardiovascular fitness levels.</p> <p>The hypothesis of this study is that notable changes in the above-mentioned outcomes would be found.</p>	<p>The study presents a systematic review of relevant data from similar randomized controlled trials and measures the effectiveness of a particular program on quantitative and qualitative outcomes. This was a randomized intervention study with a pre-test post-test study design. The study design was a voluntary school self-select program design. Paired two-sample T tests were used to compare continuous variables such as student knowledge scores and chi-squared tests were used to assess categorical variables such as PACER performance.</p>	<p>The Independent variable used is the HealthMPowers program, which was promoted participant changes over the course of three years.</p> <p>The dependent variables measured in this study are the school environment, student knowledge, behavior, cardiovascular fitness levels, and body mass index.</p>	<p>The Progressive Aerobic Capacity Endurance Run (PACER) test, Continuous Improvement Tracking Tool (CITT), SAS macro, Body Mass Index (BMI), and self-assessment measures were used to collect data.</p> <p>PACER is a test used to calculate aerobic capacity</p> <p>CITT was a HealthMPowers-developed instrument designed to measure and compare continuous variables such as student knowledge scores and BMI-for-age Z scores.</p> <p>BMI is defined as Body Mass Index. And was calculated through the CITT instrument after height and weight were measured through the SAS macro created by the CDC. Heights and weights were measured in inches and in pounds.</p>	<p>Study results suggest that there were significant improvements in student knowledge, behavior, and self-efficacy across all cohorts, especially after the first or second year of the program was completed. Decreases in BMI-for-Age Z scores for multiple cohorts across grades and gender was most significant for students that were overweight or obese at baseline were also seen.</p>
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		The population of this study included 4 th and 5 th grade students from 40 schools over the course of three years. The program reached over 39,272 students and their families and over 2,604 staff members at the schools which spread across 19 districts.			
Reference & Level of evidence	Problem, Purpose, & Hypothesis	Design & Population Sample	Independent & Dependent Variables	Measures & Operational Definitions	Outcomes & Findings
Fairclough, S. J., Hackett, A. F., Davies, I. G., Gobbi, R., Mackintosh, K. A., Warburton, G. L., & ... Boddy, L. M. (2013). Promoting healthy weight in primary school children through physical activity and nutrition education: a pragmatic evaluation of the CHANGE!	The gap of this research study is a lack of knowledge about the effectiveness of the CHANGE! intervention program. The purpose of this study was to	The design of this study was a randomized controlled trial using a pre-test, post-test design. The population sample of this study included 318 children ages 10-11 from 6 intervention	The independent variable of this study was the CHANGE! program which took place over the course of 20 weeks, that was being evaluated. The dependent variables being evaluated were the participants' body	BMI was calculated to the nearest 0.1 kg by taking body mass 9kg / stature ² (m ²) . Stature was calculated to the nearest 0.1 cm by using a non-elastic anthropometric tape. Waist circumference was measured to the nearest 0.1 cm with the same non-elastic	The CHANGE! Intervention was proven to have a significant impact on the body size outcomes of overweight and obese participants, especially girls. Findings also support the effectiveness of combining school-based nutrition and PA interventions.

<p>randomised intervention study. <i>BMC Public Health</i>, 13(1), 1-14. doi:10.1186/1471-2458-13-626</p> <p>The level of evidence represented in this study is level 2.</p>	<p>pragmatically evaluate the effectiveness of the CHANGE! intervention program on outcomes such as physical activity levels, food intake, and body size.</p> <p>The hypothesis of this study was that the CHANGE! program would be effective at altering the above factors being examined.</p>	<p>schools and 6 comparison schools</p>	<p>mass indexes (BMIs), the objectively-assessed physical activity and sedentary time, and their food intake.</p>	<p>anthropometric tape. ActiGraph GT1M accelerometers were used to assess the volume and intensity of physical activity (PA).</p> <p>A 24-hour food intake recall questionnaire was used to assess food intake among participants.</p> <p>Somatic maturity status was calculated by using sex-specific regression equations.</p> <p>Google Earth Pro (GEP) was used to calculate playground spatial data.</p>	
<p>Reference & Level of evidence</p>	<p>Problem, Purpose, & Hypothesis</p>	<p>Design & Population Sample</p>	<p>Independent & Dependent Variables</p>	<p>Measures & Operational Definitions</p>	<p>Outcomes & Findings</p>
<p>Vasques, C., Magalhães, P., Cortinhas, A., Mota, P., Leitão, J., & Lopes, V. P. (2014). Effects of Intervention Programs on Child and Adolescent</p>	<p>The problem represented in this study is that a low magnitude of intervention programs studied</p>	<p>This study was of the meta-analysis design.</p> <p>The population sample included any</p>	<p>The independent variables represented in this study were the multiple intervention programs that were systematically</p>	<p>The Q_B test was used to determine the influence of the variables being examined.</p> <p>Fixed-effect analyses were conducted took study sample</p>	<p>This meta-analysis study found that there was a low magnitude ($r=0.68$), but intervention programs proved to have a positive effect in the prevention and</p>

<p>BMI: A Meta- Analysis Study. <i>Journal Of Physical Activity & Health</i>, 11(2), 426-444.</p> <p>This meta-analysis study is based on level 1 evidence.</p>	<p>have had a positive effect in prevention of childhood obesity and decreasing the numbers of current childhood obesity rates.</p> <p>The purpose of the study was to assess the efficacy of school-based intervention programs and after-school programs on the BMIs of the participants included.</p> <p>The hypothesis of this study was that there would be a significant effect of the programs studied, on the BMIs of the</p>	<p>participants of studies conducted fitting the research study's inclusion criteria including articles with intervention programs for at least 6 weeks with reported effect size of participants' (under the age of 19) BMI. Participants were divided up into categories by age and were considered "elementary children", (≤ 10 years of age), "middle school age" (aged $\geq 10-15$) and "high school age" (aged $\geq 15-19$).</p>	<p>reviewed in this meta-analysis.</p> <p>The dependent variables discussed in this meta-analysis study were the participant outcomes such as BMI, physical activity level, and nutrition. The overarching dependent variable was obesity rates among participants.</p>	<p>size and standard error in to effect when determining each article's statistical importance within this study.</p> <p>A standard funnel plot was used to test for bias and rank-correlation test of Begg and Mazumdar was used to back up the funnel plot bias analysis.</p> <p>Comprehensive Meta-Analysis (CMA) version 2.2.048 was used to run statistical analysis.</p> <p>BMI was commonly used throughout the study and was used in addition to measuring skinfolds of subcutaneous fat or waist perimeter.</p>	<p>decreasing of childhood obesity. The effect was more significant in older children, in programs that combined nutrition and PA aspects, and in programs that included parental participation. After-school programs and school-based intervention programs proved to have similar effects.</p>
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Reference & Level of evidence	Problem, Purpose, & Hypothesis	Design & Population Sample	Independent & Dependent Variables	Measures & Operational Definitions	Outcomes & Findings
<p>Friedman, A. J., Cosby, R., Boyko, S., Hatton-Bauer, J., & Turnbull, G. (2011). Effective teaching strategies and methods of delivery for patient education: a systematic review and practice guideline recommendations. <i>Journal Of Cancer Education, 26</i>(1), 12-21. doi:10.1007/s13187-010-0183-x</p> <p>The level of evidence represented in this study is level 1 data.</p>	<p>participants.</p> <p>The problem presented in this study was the need for information amongst patients and the limited resources available to health care workers.</p> <p>The purpose of this study was to determine which teaching strategies and methods of delivery for patient education (PE) were effective.</p> <p>The hypothesis of this study was that the use of the guidance</p>	<p>A systematic review was used with and without meta-analysis. That evidence formed the basis of the recommendations developed by the Patient Education Working Group (PEWG). MEDLINE, EMBASE, CINAHL, and HealthSTAR were the databases used for searching relevant publications. Search term included: PE, teaching strategies, and methods of delivery. Only articles written in English and of reports of systematic reviews or meta-</p>	<p>The independent variable was the perceived need for PE in cancer patients.</p> <p>The dependent variable was increase in PE using the guidance document in delivering PE to cancer patients.</p>	<p>Each systematic review was assessed using the AMSTAR tool. The systematic review and meta-analyses used for this study included previous studies that reported on many different types of measures of patient outcomes. All systematic reviews were checked for overlap.</p>	<p>Each teaching strategy was effective, to some degree. Yet, some teaching strategies were more effective than others. Verbal teaching and discussions were the least effective teaching strategies and verbal teaching should be used in combination with other methods. Overall, after taking in to consideration the learning and cognitive needs of each patient on an individual level, computer technology, audiotapes, videotapes, written materials, and lectures were found to be the most effective methods of PE.</p>

	document would allow healthcare professionals to use limited resources when designing and delivering PE programs.	analysis were used.			
Problem, Purpose, & Hypothesis	Problem, Purpose, & Hypothesis	Design & Population Sample	Independent & Dependent Variables	Measures & Operational Definitions	Outcomes & Findings
Herbert, P. C., Lohrmann, D. K., Seo, D., Stright, A. D., & Kolbe, L. J. (2013). Effectiveness of the Energize Elementary School Program to Improve Diet and Exercise. <i>Journal Of School Health</i> , 83(11), 780-786. The level of evidence represented in this study is level 3 data.	The problem proposed in this study is that adult patterns of behavior are mimicked by children, thus increasing the rates of childhood obesity by the observed behaviors of adults. The Purpose of this study was to evaluate a school-based obesity	The study was a quasi-experimental design. The population sample included third and fourth grade students during the 2010 to 2011 school year, within three Indiana elementary school; 104 out of 146 students participated (71.23%). Out of these, 59 of 73 (80.82%) Energize students and 45 of 63 (71.42%) for the control group. Of	The independent variable in this study was the Energize program that took place over 12 weeks. The dependent variable in this study was the amount of physical exercise and dietary changes in third and fourth grade students participating in the Energize program.	Student Health Assessment Questionnaire (SHAQ) was used to measure the dietary and activity levels of the children; using a Likert scale to assess 24 hours of dietary intake and physical activity levels. Analysis of the pre-test and post-test SHAQ was conducted using PASW Statistics 17. The null hypothesis, that there were no significant differences in dietary and physical activity habits between the Energize group and the control group, was	The analyzed post-test questionnaires showed no significant difference between the Energize group and the control group in regards to the individual food and activity questions. There was a marginal difference between the Energize and control group over 12 weeks in the consumption of vegetables ($p=.68$). Energize participants showed a marginally significant increase in vegetable consumption ($p<.10$). No significant differences in physical activity were

	<p>prevention program in elementary school children and to determine if there was a significant difference in the dietary and physical activity habits between those involved in the program and a control group.</p> <p>The hypothesis of the study was that after 12 weeks, the majority of children involved, and the dietary and physical activity habits would be improved, thus creating long-term changes.</p>	<p>those who reported demographics, 46 boys and 58 girls, ages ranged from seven to eleven years of age, 71 white and 30 non-white.</p>		<p>tested with a 1-way analysis of covariance (ANCOVA) with pre-test score as the covariate ($p=.05$). HLM 7 was utilized to test the null hypothesis that no significant between the Energize group and the control group in dietary and physical activity habits measured through a 24-hour diet/activity log during the first 12 weeks. HLM was used to account for correlated observations.</p>	<p>found between the Energize group and the control group, as per their activity logs. Overall, the results indicate that Energize is only marginally effective in dietary changes in third and fourth grade students in Indiana, while it is not effective in increasing physical activity.</p>
Problem, Purpose, & Hypothesis	Problem, Purpose, & Hypothesis	Design & Population Sample	Independent & Dependent Variables	Measures & Operational Definitions	Outcomes & Findings
Herrick, H., Thompson,	With an increase	A quasi-	The independent	Cardiorespiratory fitness	Baseline findings showed

<p>H., Kinder, J., & Madsen, K. A. (2012). Use of SPARK to Promote After-School Physical Activity. <i>Journal Of School Health</i>, 82(10), 457-461. doi:10.1111/j.1746-1561.2012.00722.x</p> <p>The level of evidence represented in this study is level 3 data.</p>	<p>in obesity in adolescents and a decrease in their physical activity, there have been mixed results in studies on interventions that aim to increase after-school physical activity, causing a problem in identifying the best practices for after-school activity promotion.</p> <p>The purpose of this study was to determine if the SPARK program helped to increase the physical activity of the children who participated.</p> <p>The hypothesis was that those who participated</p>	<p>experimental controlled study of the SPARK program and its impact on health outcomes was evaluated over a five month period in 2009. 168 fifth grade students, from six study schools, were included in the study. Written consent was obtained from each participant's parent or guardian and the students gave verbal consent to participate in the study. Thirteen schools were chosen, of those, three schools were used as a control group.</p>	<p>variable was the SPARK program and its intent to reduce the BMIs and BMI z-scores and increase the VO2 of each participant.</p> <p>The dependent variables were the actual BMIs, BMI z-scores, and VO2s of each participant within the study.</p>	<p>(VO2) was assessed amongst the participants, using the validated 20-m shuttle test. Height was measure, to the nearest tenth of a cm, using a 420 Measure-All Portable Measuring Board. Weight was measured, to the nearest tenth of a kg, using a Tanita Model BWB 800 digital scale. Students completed a scale that assessed frequency of exercise and enjoyment of sports. Physical activity was assessed using a unilateral GT1M accelerometer. School days were divided into three times: before school, school day, after school, and evening. A 30-second epoch was used during activity and was categorized as MVPA if the total activity counts for the epoch were greater than or equal to 1148. Total minutes of the MVPA were calculated as a representation of the student's activity. BMIs and BMI z-scores were calculated, as were the participant's VO2 max. The differences between the</p>	<p>that girls were less active than boys during school (MVPA 14.4 vs. 22.7 minutes, $p < .001$) and after school (MVPA 14.9 vs. 21.8 minutes, $p < .001$). Overweight status did not vary MVPA baseline. No difference was found in the change in minutes of MVPA in the after-school period over five months. During the follow-up, girls remained less active and the MVPA did not differ in regards to sex. The SPARK program did not modify the MVPA in regards to weight status. There were no BMI z-score or cardiorespiratory changes overall. However, the students who participated in the SPARK program reported a higher perception in the physical activity level in comparison to the control group.</p>
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	in the SPARK program would see an increase in physical activity and VO ₂ and a decrease in their BMIs and BMI z-scores.			intervention and control schools were analyzed by linear mixed effects models.	
Problem, Purpose, & Hypothesis	Problem, Purpose, & Hypothesis	Design & Population Sample	Independent & Dependent Variables	Measures & Operational Definitions	Outcomes & Findings
Smuka, I. (2012). Teacher role model and students' physical activity. <i>Polish Journal Of Sport & Tourism</i> , 19(4), 281-286. The level of evidence represented in this study is level 2 data.	The problem proposed in this study is that children do not exercise enough and that the effects of little exercise on human health has lost topicality and is only being broadly discussed within the scientific community. The purpose of this study was to better understand the factors that	This was a pedagogical experiment. Two Latvian schools were chosen. From those schools, 75 students, 33 girls and 42 boys, aged 14 to 19 years were involved with the study; the average age being 16.3 years. Three sports teachers also participated. Teachers used an existing model of pedagogical interaction in their physical education classes over 14	The independent variable was the involvement of a competent teacher in the daily use of increased physical activity in students. The dependent variables were the emotional involvement of the teachers and students, the interests of the teachers and students, and the overall increase of physical activity.	A survey method was used to collect basic data regarding the students' physical activity. A semi-structured interview was conducted to find out the opinions of the students and teachers on the pedagogical interaction model in practice. Each student was equipped with a pedometer during sports classes to record and analyze the steps run. An ANOVA test was performed on the students from both schools to analyze the changes in the student's physical activities.	There was an 18% increase in the number of students who engaged in physical activities on a daily basis. There was a 24% increase in physical activities among students who acted three times a week. The number of those who exercising two to three times a week increased by 43%. Without the participation of a teacher during PE classes, and based on the analysis of a pedometer, girls ran an average of 100% steps. However, they ran an average of 110.55% with the participation of a teacher. For boys, they ran

	<p>contribute to a student's physical activity.</p> <p>The hypothesis was that teacher involvement increased the student's physical activity. Being that the teachers were good communicators, had knowledge of psychology, had the ability to model relationships and predict the possible results, and be a step ahead of each student.</p>	<p>weeks.</p> <p>A survey methodology was used with a semi-structured interview.</p>			<p>100% of steps without a teacher and 140.99% with one. The students also reported a higher level of interested in physical activity. While the teachers reported the only negative aspects, that they were not all able to perform the physical activities along with their students.</p>
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- All informed consent documents
- Permission from applicable authorities (principals of schools, teachers of classrooms, etc.) to conduct your research at their facilities on their School Letterhead.
- Students need signatures from their faculty advisor.

All student applications must be signed by the faculty advisor then scanned and submitted electronically, or submitted directly by the faculty advisor. All applications should be submitted by email to irb@southern.edu.

Please be aware you cannot begin your research until it has been officially approved by the IRB.

Type of Research- Check all areas that apply

Dissertation/Thesis

Funded Faculty Research

General Faculty Research

Applying for ARC Funding

Student Research

Other: Animal/Plant

Background and Rationale for the Study: (This section should present the context of the work by explaining the relation of the proposed research to previous investigations in the field. Include citations for relevant research.)

Childhood obesity has been established as a major contributing factor in the early onset of many health disparities, including adult obesity, type 2 diabetes, and hypertension (Boles, Johnson-Shelton, & Moreno, 2013, p.158). Childhood obesity is defined as having a body mass index (BMI) of greater than or equal to the 95th percentile for children of the same age and gender (Boles, Johnson-Shelton, & Moreno, 2013, p.158). As of 2012, the

national childhood obesity rates had raised to approximately 18% in U.S. children aged 6-11 (Ogden, Carroll, Kit, & Flegal, 2014, p.808). In response to these findings, many school-based programs have been implemented in attempts to reduce the overall percentage of obese children and their likelihood of developing preventable health disparities, such as the aforementioned, in addition to teaching healthy lifestyles at an early age.

Purpose/Objectives of the Research: (Briefly state, in non-technical language, the purpose of the research and the problem to be investigated. When possible, state specific hypotheses to be tested or specific research questions to be answered. For pilot or exploratory studies, discuss the way in which the information obtained will be used in future studies so that the long-term benefits can be assessed.)

School-based obesity prevention initiatives have gained popularity in recent years and act as an effective means of reaching youth and helping to decrease the prevalence of obesity amongst children in the United States (Mohan, Smith, Corriveau, Kline-Rogers, Jackson, Eagle, Godberg & DuRussel-Weston). With many of these programs in place, it is important to understand which methods are most effective; those taught by verbal instruction alone or those based upon teachers and school staff modeling diet and exercise behaviors. Our study aims to compare the results of weight loss outcomes in students modeling behaviors after their teachers' diets and exercise-related behaviors versus those students who were only given verbal instructions about diet and exercise recommendations.

For the purpose of future studies, the information obtained will help to guide future researchers in a direction that will allow them to use the best possible teaching methods, if their population samples are similar to those participating in this study.

Methods and/or Procedures: (Briefly discuss, in non-technical language, the research methods which directly involve use of human subjects. Discuss how the methods employed will allow the investigator to address his/her hypotheses and/or research question(s).)

A convenience sample of male and female children, attending six local schools, aged six to twelve years of age, without ethnic exclusion, will be voluntarily selected after parental informed consent is given for study participation. Participants must be physically capable of participating in physical activity, mentally intact and of comparable intellect to their peers, and will have parental consent prior to the study.

At the beginning of the study informed consent for inclusion forms will be sent home with all applicable students at the bottom of the consent form a brief five-question survey about the child's current PA and dietary habits will be included. The form will also include information about study procedures and objectives. After one week all participants who have obtained parental consent will be assigned an appointment time with the school nurse during which time their pre-study BMI will be recorded. For three months the two instruction methods of interest will be applied in the participating schools. Three schools will use verbal-only instruction methodology while the remaining three schools use role-modeling techniques. At the conclusion of the three-month trial period appointments will again be made for each participant to be evaluated by the school nurse. Post-study BMIs will be collected and compared to the original findings. An additional three-item questionnaire will be sent home with participants and returned to school within one week so that post-test outcomes pertaining to nutrition and physical activity can also be evaluated for any changes. By studying two sets of students using two different teaching methods, the most effective teaching method will be revealed, thus giving future researchers evidence of the most effective teaching methods and reliable methods for obtaining and evaluating data for a similar population.

Description of Research Sample: If human subjects are involved, please check all that apply:

- Minors (if minors are involved please attach a Childs Assent Form)
- Prison Inmates
- Mentally Impaired
- Physically Disabled
- Institutionalized Residents

- Anyone unable to make informed decisions about participation
 Vulnerable or at-risk groups, e.g. poverty, pregnant women, substance abuse population
 Health Care Data Information - be **sure to attach any necessary HIPAA forms if this line is checked**
 Other: Animals or plants will be used
 Other: please describe

Approximate Number of Subjects: 2000

Participant Recruitment:

Describe how participant recruitment will be performed. Include how potential participants are introduced to the study (Please check all that apply)

SAU Directory:	Postings, Flyers <input checked="" type="checkbox"/>	Radio, TV
E-Mail Solicitation	How Were Addresses Obtained	
Web-based Solicitation	Indicate Site	Indicate Site
Participant Pool	What Pool	
Other, Please Specify		
Attach Any Recruiting Materials You Plan to Use and the Text of E-mail or Web-based Solicitations You Will Use		

Content Sensitivity:

Does your research address culturally or morally sensitive issues? Yes No If yes, please describe.

Privacy and Confidentiality:

Efforts will be made to keep personal information confidential. We cannot guarantee absolute confidentiality. Personal information may be disclosed if required by law. Identities will be help in confidence in reports in which the study may be published and databases in which results may be stored.

- Will personal identifiers be collected? Yes No
 Will identifiers be translated to a code? Yes No
 Will recordings be made (audio, video) Yes No If yes, please describe.

Is Funding being sought to support this research? No

Circle to indicate if the funding is: Internal or [External] Funding? Is there a funding risk? N/A, No

Who will keep the financial records? Sherri Bakland, BSN RN and Elizabeth Moore-Jones, BSN RN

Who will have access to data (survey, questionnaires, recordings, interview records, etc.)? Please list below.

Sherri Bakland, BSN RN and Elizabeth Moore-Jones, BSN RN

Participant Compensation and Costs

Are participants to be compensated for the study? Yes No

If yes, what is the amount, type and source of funds: N/A

Amount \$ _____ Type: _____ Source _____

Will participants who are students be offered class credit? Yes No NA

Are other inducements planned to recruit participants? Yes No If yes, please describe

Are there any costs to participants? Yes No If yes, please explain _____

Other: Animals/Plants

Are the animals/plants being studied on the endangered list? NA _____

Are Scientific Collection Permits required, i.e. Tennessee Wildlife Resources Agency? NA _____

Have the animal(s) utilized in this study already been used in a previous study (non-naïve animals)? NA _____

Will the animal(s) used in this study be used in a future study? NA _____

Where will the animals be housed? NA _____

Will the rodents (if applicable) be housed in wire bottom cages? NA

Will plants be used for instructional purposes as part of teaching a course? NA

Are there any risks involved with this study? **Yes** **No**

Are there any potential damage or adverse consequences to researcher, participants, or environment? These might include physical, psychological, social, or spiritual risks whether as part of the protocol or a remote possibility. Please indicate all that apply.

Physical Risk: May include pain injury, and impairment of a sense such as touch or sight. These risks may be brief or extended, temporary or permanent, occur during participation in the research or arise after.

Psychological Risk: Can include anxiety, sadness, regret and emotional distress, among others. Psychological risks exist in many different types of research in addition to behavioral studies.

Social Risk: Can exist whenever there is the possibility that participating in research or the revelation of data collected by investigators in the course of the research, if disclosed to individuals or entities outside of the research, could negatively impact others' perceptions of the participant. Social risks can range from jeopardizing the individual's reputation and social standing, to placing the individual at-risk of political or social reprisals.

Legal Risk: Include the exposure of activities of a research subject "that could reasonable place the subjects at risk of criminal or civil liability".

Economic Risk: May exist if knowledge of one's participation in research, for example, could make it difficult for a research participant to retain a job or find a job, or if insurance premiums increase or loss of insurance is a result of the disclosure of research data.

Spiritual Risk: May exist if knowledge of one's spiritual beliefs or lack of, could be exposed which in turn could invoke an economic, social and or psychological risk.

Risks: In your opinion, do benefits outweigh risks? **Yes** **No**

Results:

The results will be disseminated as:

Classwork only Student conference Professional conference
 Published article Other

If other, please specify: Results will be presented in a bullet point format and mailed home to student participants' families

Signatures: If submitted by a faculty member, electronic (typed) signatures are acceptable. If submitted by a student, please print out completed form, obtain the faculty advisor's signature, scan completed form, and submit it via e-mail. Only Word documents or PDF files are acceptable submissions.

Principal Investigator (PI) or Student

Date

Faculty Advisor (for student applications)

Date

All student applications must be signed by the faculty advisor then scanned and submitted electronically, or submitted directly by the faculty advisor. All applications should be submitted by email to: irb@southern.edu

Additional Special Requirements or Attachments to the Application

Approvals from other IRBs

Cooperative research projects involve research that involves more than one institution. In these instances, federal law holds each institution responsible for safeguarding the rights and welfare of human subjects and for complying with federal policy; therefore, SAU IRB applications must be made even if there is another institution conducting a review of the same research project. When a study is being carried out at a non-USA site, and approval from other institutional review boards at the foreign site must be sought. The IRB recommends that a copy of each IRB approval be submitted.

Questionnaires/Other Instruments

Any questionnaires, tests, survey instruments or data collections sheets which are not standard and well known must be submitted as part of the application. Structured interview questions and outlines for unstructured interviews also must be included.

Advertisements/Notices/Recruitment Flyers

The text of any advertisement, video display, notice, sign, brochure or flyer used to recruit subjects either should be included as an attachment.

Informed Consent for Participants