Evaluation of a Middle School Based Program to Improve Knowledge on Healthy Nutritional and Physical Behaviors

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Introduction

Childhood obesity has been characterized as an epidemic by the Institute of Medicine (IOM) due to its pervasiveness that transcends ethnicity, gender, and age. Obesity has placed children at risk for developing hypertension, diabetes, and stroke.

Objectives

We sought to determine whether a middle school- based health intervention promoting healthy eating, physical activity, and education on obesity would increase knowledge and change behaviors to decrease the risk of obesity.

Methods

Cohort

A pre-test post-test design was used on a group of 30 middle school students in one health class. Students were given a modified version of the CDC's 2017 Youth Risk Behavior Surveillance System Questionnaire (YRBSS) as a knowledge test and their Heights and weights were measured for BMI calculation pre-intervention. The intervention composed of a 12- week health curriculum that focused on healthy eating, increased physical activity, and knowledge of obesity. Post intervention, the same YRBSS questionnaire was given with the inclusion of three questions and heights and weights were remeasured for BMI calculation. A paired t-test was used to analyze the data pre-and post-intervention to determine if there was any significant difference.

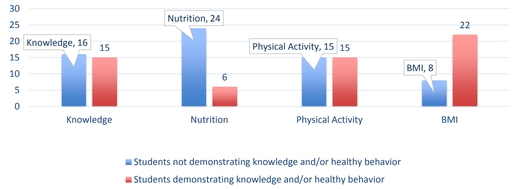
Study Variables

Knowledge and demographics of the students were determined with the administration of the modified YRBSS questionnaire. BMIs were calculated to determine the level of student's health. Weekly attendance and the administration of 3 questions [Do you feel like you have lost weight since the beginning of the program? Do you feel like your physical activity has increased since the beginning of the program? Do you feel like you have the tools you need to eat healthier due to what you learned in the program?] in the post- test were used to determine the success of the intervention.

Table 1.
Demographic Information for Sixth Grade Students Participating in 12-week Curriculum (n=30)

Characteristics	N (%)
Gender	
Male	14 (47%)
Female	16 (53%)
Age	
11	21 (70%)
12	9 (30%)
Race	
Asian	1 (3%)
Black	13 (44%)
White	6 (20%)
Hispanic	3 (10%)
Mixed Race	7 (23%)
Socioeconomic Status, (Do you receive reduced/free lunch?)	
No	3 (10%)
Yes	27 (90%)

Figure 1 : Pre-Intervention Knowledge, Nutrition and Physical Behaviors, and BMI (n=30)



Statistical Analysis

The pre-test answers on knowledge and behaviors of 30 students were matched to their post-test answers. A paired t-test in SPSS was used to measure any variation and determine statistical significance. Pre-intervention BMI was paired with post-intervention BMI and a paired t-test was also used to determine statistical significance.
All analyses were performed using SPSS 23

Results

A paired t-test was used to compare baseline data from post-intervention data. This data was used to determine the effects of the intervention on student's knowledge, behavior, and BMI.

The participants in the 12-week curriculum were 30 students from one middle school health class in Southeastern, VA. The student participants were of varying ethnicities, aged 11 and 12 years old, and majority low socioeconomic status.

Participants received one point for every correct response on knowledge and healthy and physical behaviors. There were four questions on healthy eating and three questions on knowledge of obesity and physical activity in the YRBSS questionnaire. There were 16 students that did not get any questions correct on obesity. Twenty-four students did not demonstrate nutritional behaviors and fifteen students did not demonstrate the correct physical behaviors. Lastly, 8 students were identified as being obese in the study.

Post- intervention data was used to compare to pre-intervention data. There was no statistical difference in knowledge, healthy eating behavior, physical behavior [p<.11, p<.96, p<.29., and p<.58] respectively. Knowledge and BMI slightly increased while healthy nutritional and physical behaviors slightly decreased among students over the 12 weeks.

Weekly attendance was taken to measure the effectiveness of the intervention. The students were able to opt out at any time. There were some students that did not choose to participate, were absent from school, or had behavior trouble in health class. There was an average of 4 student absent each week.

Summary

Overall, an increase in a child's BMI as well as decline in healthy behaviors could have been influenced by many factors. The low socioeconomic status of a student could stimulate a decline in healthy behaviors. Specifically, if the student's parents/guardians were unable to afford healthy food for the student's consumption or had limited access to these items. The decline in physical activity could have been affected by the winter temperatures or the student's socioeconomic status. Students may not have had access to engage in safe physical activity due to their locale.

Table 2:
Paired Sample *t*- Test Analysis of Pre-and Post- Intervention Knowledge, Behaviors, and BMI *N=30*

Variable	*M*	*SD*	*p*
Knowledge			
Pre-Intervention	.77	.97	.11
Post-Intervention	1.07	.83	
Behavior			
Healthy Eating			
Pre-Intervention	1.80	.96	.36
Post-Intervention	1.60	.81	
Physical Activity			
Pre-intervention	1.18	.96	.29
Post-Intervention	.95	.72	
BMI			
Pre-Intervention	21.55	5.85	.58
Post-Intervention	21.76	5.84	

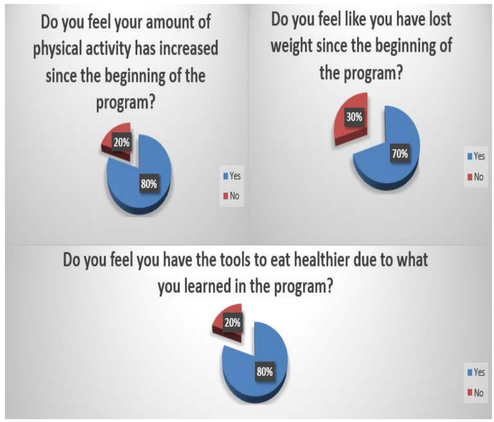
*Knowledge and Physical Activity were determined by three questions. Healthy Eating was determined by four questions. Each participant received 1 point for every correct response.

Further pilot studies are needed to examine students after exposure to the same intervention, yet with an extension of exposure to curriculum, beyond 12- weeks. Once this is administered, then the same students need to be followed throughout middle school to determine if their knowledge and healthy behaviors increase and their BMI decreases.

Conclusions

Students were polled at the intervention. Eighty percent of the students believed that their physical activity had increased, 70% believed that they had lost weight since the beginning of the program, and 80% believed they had tools to eat healthier. Although this school-based health education curriculum may not have produced statistically significant results, it did prove to have a positive effect on the self-perception of the participants' knowledge and behaviors.

Figure 2



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