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Promoting healthy habits among children in a residential facility.

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Abstract

Background: Childhood obesity has been a significant public health concern in the United States. The prevalence of obesity among children and adolescents has increased over the past few decades. There are serious implications for immediate and long-term health. It poses serious health risks and economic challenges.

Setting: This quality improvement project will take place at a residential psychiatric treatment facility and therapeutic foster care program for children and adolescents with mental health or behavioral issues. This facility is in the suburbs of Louisville, Kentucky.

Purpose: The purpose of this project is to boost physical activity and improve knowledge about nutrition and physical activity for children residing in a treatment facility.

Procedures: Procedures: This quality improvement project will consist of an 8-week intervention that focuses on physical activity and nutrition education. There will be two 45-minute sessions a week with one focusing on physical activity and one focusing on nutrition. The sessions will consist of 15 minutes of education and 30 minutes dedicated to experimental learning.

Measures: The Kids Activity and Knowledge Questionnaire (KAN-Q) and the Modified Canadian Assessment of Physical Literacy 2 (CAPL-2) were used to evaluate physical activity time, physical activity knowledge, and nutritional knowledge for this quality improvement project.

Keywords: childhood obesity, physical activity, nutrition, quality improvement

Childhood Obesity: An Evolving Concern

Obesity is a major public health concern. Globally, more than 1.9 billion adults are overweight and 650 million adults obese (Mahmood et al., 2020). In 2022, an estimated, 1 in 3 adults struggled with obesity in the United States (Centers for Disease Control and Prevention [CDC], 2022). Notably, all states and territories in the United States had an obesity rate of > 20%, and Kentucky ranks amongst the highest prevalence with a rate of 37.7% (CDC, 2023). These numbers are continuing to grow at variable rates.

Nationally, fewer than 1 out of every 10 children and adults consume the recommended daily servings of vegetables (CDC, 2022). As if diet alone was not enough, fewer than 1 in 4 children get enough physical activity and only 1 in 4 adults meet physical activity guidelines (CDC, 2022). The habits that are established during childhood are critical, as children who are obese are more likely to struggle with obesity as adults.

The Centers for Disease Control and Prevention defines obesity in children as a body mass index (BMI) greater than or equal to the 95th percentile of the CDC growth charts, according to sex (CDC, 2022). During the three-year span from 2017 and 2020, the prevalence of childhood obesity over the three-year span was 19.7% and affected 14.7 million children and adolescents in the United States (CDC, 2022).

Obesity in children and adolescents in Kentucky is above the national average. Kentucky ranks among the highest obesity rates in the nation for children between the ages of 10 and 17, at 23.8% (Robert Wood Johnson Foundation, 2022). Although obesity is a public health concern across all populations, there is an alarming disparity in obesity rates among low and middle-income children and adolescents (Tyson & Frank, 2018). According to the CDC, obesity

prevalence among children in low-income homes was 18.9%, 19.9% for children in middle-income homes, and 10.9% in the highest income homes (CDC, 2022).

Obesity is a complicated and multifaceted issue, as genetics, behavior and activity level, genetics, diet, age, family characteristics, gender, medications, socioeconomic status, and even school policies can impact BMI (Sahoo et al., 2015). Childhood obesity has lifelong repercussions that lead to poor health outcomes. Obesity can lead to one or more diseases such as abnormal blood pressure, fatty liver, polycystic ovarian syndrome, pre-diabetes, obstructive sleep apnea, and many psychological disorders (Tyson & Frank, 2018).

Not only does obesity take a toll on the physical and mental well-being of a child, but obesity also takes a toll on society and the healthcare system. Being overweight or obese as a child significantly increases total medical costs, nonhospital healthcare costs, medication costs, and hospitalization costs (Ling et al., 2022). In 2022, the increased medical costs for children who were overweight or obese were approximately $45 billion annually (Ling et al., 2022). As childhood obesity rates continue to rise, so does its economic burden. It is estimated that by 2050, childhood obesity is projected to cost over $13 billion in direct medical costs and $49 billion in indirect costs (Ling et al., 2022). The disparity of burden on the healthcare system influences adulthood as well, as the literature demonstrates that increased physical visit costs in adults who are overweight are approximately $500 per capita attributable to overweight and obesity (Ling et al., 2022). An intervention targeting childhood obesity could mitigate the physical, psychosocial, and economic affliction of this far-reaching disease.

Literature Review

Obesity is one of the most alarming health problems at local, national, and global levels with implications for all populations. Obesity inflicts personal, societal, and economic challenges

for children, families, communities, and countries (Ling et al., 2022). In 2020, it was estimated that 39 million children who were under 5 years old and 150 million children who were 5-19 years old were overweight or obese globally (Ling et al., 2022). The obesity epidemic has been further exacerbated by the coronavirus disease, as the pandemic doubled the increase rate of BMI among children in the United States, with preschoolers and school-aged children experiencing the most significant increase (Ling et al., 2022). Sustainable and scalable educational programs have been shown to decrease BMI, increase healthy dietary consumption, and increase time spent physically active.

A literature search was conducted to determine the type of educational programs that improve obesity in children. The search resulted in a large number of publications focus on childhood obesity. The search was narrowed down by limiting to only systematic reviews, randomized controlled trials (RCTs), and quasi-experimental design studies. It was further limited by including only those that have been published in the previous five years. The remaining articles were reviewed and appraised using the LEGEND system, and ultimately 15 articles remained and were used. The comprehensive search of the literature found that there are strong levels of evidence supporting interventions to address obesity and elevated BMI in children and supports combining both physical activity and nutritional components in a hands-on intervention. Literature with a focus on school-based implementation was primarily chosen for the literature review as it is most closely applicable to an inpatient treatment facility that incorporates the school setting.

A large portion of the literature focused on nutritional education as an intervention, a smaller portion focused on physical activity, and a considerable amount incorporated both nutritional and physical activity interventions in the home, school, or community setting as a

combined approach. There is a lack of literature addressing interventions to combat obesity in an inpatient residential knowledge tests, fruit and vegetable intake, waist circumference, and BMI were the most frequent metrics used to determine the different approaches' effectiveness.

Throughout the literature, nutrition was a primary focus of a large portion of research on preventing obesity in children and was shown to create positive outcomes. Nutritional education empowers children to make better food choices (Andueza et al. 2022; Bourke et al. 2014; Pastor & Tur 2020, Rohde et al. 2017). Rodhe et al. (2017) found that after a 15-month educational intervention about nutrition children between the ages of two and six had a lower intake of carbohydrates and added sugar. Interventions for school children aimed at increasing nutritional knowledge led to increased daily consumption of fruits and vegetables and increased the likelihood of meeting daily recommendations for servings of fruits and vegetables (Andueza et al., 2022; Bourke et al., 2014; Pastor & Tur, 2020).

In a systematic review of 10 randomized controlled trials (RCTs), Leis et al. (2019) concluded that educational nutritional interventions can significantly decrease waist circumference. Similar results were found from a systematic review of 12 RCTs that showed nutritional-based interventions can decrease BMI, waist circumference, and glycemic index (Andueza et al., 2022). Promotional interventions lead to better outcomes (Bourke et al. (2014) and St. Pierre et al. 2021). It is more effective to encourage children to make healthy food choices rather than depreciating less healthy choices. Research shows that experimental learning is an effective teaching method for school-aged children. A recent study conducted by Ng et al. (2022) supports this claim, revealing that programs incorporating experimental learning methods can help improve children's diets and reduce obesity.

Physical activity was identified as a major intervention for childhood obesity. Arlinghaus et al. (2021) and Seo et al. (2019) conclude that promoting physical activity among school-aged children can reduce BMI and prevent obesity. In an RCT of students between 6th and 12th grades, Arlinghaus et. al (2021) determined that implementing a school-based physical activity program during physical education class was both cost-efficient and effective in decreasing BMI. A study was conducted on 103 children between the ages of 6 and 16 years who had a BMI equal to or greater than the 85th percentile, which is classified as overweight. The study concluded that a physical activity approach that can be taught in school and maintained at home not only reduced BMI but also improved physical fitness and cardiometabolic markers (Seo et al., 2019).

The literature asserts that increasing knowledge about physical activity amongst children can increase time spent physically active. It has also shown that increasing nutritional knowledge leads to healthier habits and better dietary consumption. The most effective interventions were those that incorporated experimental learning as an educational component. The literature establishes an intervention combining both physical and nutrition components as the best approach to contest childhood obesity. Therefore, it can be concluded that an intervention with an experimental learning design that aims to educate children about both physical activity and nutrition is the most appropriate and most likely to succeed.

Rationale

Obesity is a complex issue that is further complicated when addressing a population of children in a residential psychiatric treatment facility. Not only are there added barriers for this population, but many of the children are taking second-generation antipsychotics. Second-generation antipsychotics are associated with an increased risk of metabolic complications including dyslipidemia, insulin resistance, type 2 diabetes, and weight gain (Ronsley et al.,

2015). Nicol et al. (2018) found that in only 12 weeks of treatment with SGAs children experienced changes in insulin sensitivity and adiposity. Over the past two decades, the use of second-generation antipsychotics (SGAs) among children and adolescents has increased (Ronsley et al., 2015) adding to the need for this quality improvement project.

An inpatient pediatric psychiatric facility also serves as a therapeutic foster care program has identified childhood obesity as an issue at the facility. The onsite Nurse Practitioner found that many children at the facility struggle with elevated BMIs while other children have multiple risk factors, including sedentary lifestyles, the use of SGAs, lack of familial support, poor eating habits, family history of obesity, or from low-income families.

The facility implemented a BMI follow-up program. Children with a BMI >80% according to CDC growth charts were followed every six months for routine labs, and bi-weekly for height and weight. These children were educated by the nurse practitioner on the 5-2-1-0 program It is recommends that children should have 5 servings of fruits and vegetables, spend 2 hours or less on-screen time, engage in at least 1 hour of physical activity, and avoid consuming sugary beverages. While the children are provided this brief education, there has not been a reduction in BMI in these children. The program is primarily monitoring for health sequelae rather than intervening to decrease BMI.

The children reside at the facility, and many of the problems that typically accompany this type of intervention were mitigated. Concerns such as transportation are minimized, as the children are onsite. Since the intervention concluded, the program has the potential to continue but has not been implemented by the facility coordinators. For the intervention to continue, a staff member would need to assume the planning of physical activities and snack for the children.

Purpose

This quality improvement project aimed to boost physical activity and improve knowledge about nutrition and physical activity for children residing in a treatment facility. The project had three specific aims. Firstly, to enhance nutrition knowledge in each participant by twenty percent. Secondly, to improve knowledge about physical activity in each participant to 20%. Lastly, to increase the time spent in physical activity to at least 60 minutes per day, three days per week.

Conceptual Framework

The success of the quality improvement project was guided by the Health Belief Model (HBM), which was originally developed in the 1950s to comprehend the reasons behind people's reluctance to adopt disease prevention measures. According to the HBM, an individual's belief in the personal risk of illness or disease, as well as their conviction in the efficacy of recommended health behaviors, are key factors in determining whether the person will adopt the new behavior. As a result, the focus of the intervention was primarily educational, to increase awareness and understanding of the potential risks of obesity, and how an individual can overcome perceived barriers and make healthier choices. This approach was expected to have a significant impact on the project's success, as it is based on the premise that increasing knowledge will lead to better decision-making and positive changes in behavior. Recent research by Saghafi-Asl et al. (2020) has also demonstrated the effectiveness of health education programs based on the HBM in promoting adherence and overall well-being of participants, which underscores the importance of this approach in supporting a successful quality improvement program.

Setting

The project took place at one of the campuses of a residential psychiatric treatment facility and therapeutic foster care program for children and adolescents with mental health or behavioral issues located in Louisville, Kentucky in the suburbs. The agency consists of two campuses that facilitate residential treatment, therapeutic foster care and adoption, and community-based services. Children at the facility typically range from 6 to 17 years old, with males ranging from 6-17 and females ranging from 6 to 11. Middle and high school students attend school onsite, while elementary students are bussed to a sister location for school. A typical stay lasts from four months to a year, with the occasional outlier. Many of the children are on medication related to mental health diagnoses and require the use of second-generation antipsychotics (SGAs).

Sample

Convenience sampling was used in this quality improvement project with 9 children who reside at the inpatient facility participating and completing the intervention. All residents who were at the facility, between the ages of 9-12 years old and who have been identified as having one or more risk factors for being overweight or obese were asked to participate for this quality improvement project, risk factors for obesity include elevated BMI, diabetes, the use of second-generation antipsychotics, a family history of obesity, or an adverse childhood event (ACE) score greater than 2. Exclusion criteria include children who were younger than 9 or older than 12 years old. Also, any child who did not have any risk factors for obesity will not be included. The children confirmed participation by placing their names on the sign-up sheet that will be in the cottages at the facility. The sign-up sheet was in the cottages for two weeks before the start of the intervention. To collect the most consistent and impartial data, children admitted to the

facility after the second week of the intervention were not included in data collection but were allowed to participate in the program.

Intervention

The quality improvement intervention consisted of a 6-week program that focused on both physical activity and nutritional education. The sessions included education about physical activity and nutrition and performing physical activities and preparing nutritional snacks. The pretest was completed on the first day of the program and the post-test was administered on the last day during week 6 of the intervention The pre-test and post-test were the modified Canadian Assessment of Physical Literacy 2 (CAPL-2) and the Kids' Activity and Nutrition Questionnaire (KAN-Q).

The focuses of the sessions for the entire project each week were physical activity and nutrition (Appendix B). Participants were asked to attend two one-hour sessions per week during the intervention. Each week, the first session focused on physical activity. The first 20 minutes focused on educating the students with the remaining 40 minutes being dedicated to applying the knowledge. Children were provided a 20-minute lesson on specific topics each week such as different types of physical activity, ways to be physically active in different environments, the amount of recommended physical activity, and the benefits of physical activity. During the 30-minute knowledge application, children participated in a structured physical activity designed to increase time spent physically active.

The second session each week focused on nutrition. The first 20 minutes focused on educating the children about food groups, recommended servings, portion control, benefits of healthy eating, and healthy snack options. The knowledge application portion was preparing healthy snacks.

Participation was encouraged to attend the sessions each week using incentives. Children were included in hands-on activities during the knowledge application portion, thus encouraging participation. Each child who participated in the knowledge application portion was able to prepare and eat a healthy snack. Attendance was kept each week noting when a child missed sessions.

There was not any training required for the staff at the facility. The only responsibility of the staff for this intervention was to ensure that the participant's schedules allowed for them to attend both sessions each week. The materials necessary for this intervention included the food for the nutritious snacks. The total budget did not exceed $250 (Appendix A).

The facility has shown a willingness and readiness to change. While conducting a needs assessment, key stakeholders were identified. One of these is the onsite nurse practitioner, who is also in charge of the BMI follow-up program at the facility and serves as the primary care provider for the children at the facility. She has witnessed the direct impact of being overweight or obese has had on the children at the facility. Other important stakeholders include the child psychiatrist, the clinical social worker, and the division director of the facility. The children and their families have also been identified as key stakeholders, as they will benefit the most from healthier habits. These individuals have a vested interest in the facility and the children and are looking to help in any way they can, therefore they are not only on board but also have optimism that the quality improvement project can have a lasting impact on the facility and the children that it serves.

One major limitation includes the census and discharges. There is a possibility of low census and discharges at the facility are not within the control of the quality improvement project facilitator. Another barrier is the willingness to participate. To reduce reluctance, silicone

wristbands will be given to those who participate. There will also be healthy snacks and hands-on activities to increase participation.

Measures

There were three outcome measures. The outcome measures were nutritional knowledge, physical activity knowledge, and time spent being physically active. These outcomes were measured using Canadian Assessment of Physical Literacy-2 (modified) and Kids' Activity and Nutrition Questionnaire in a pre and post-test format.

The Canadian Assessment of Physical Literacy is a dependable tool to assess the physical activity literacy of children 8-12 years of age. The CAPL-2 is a streamlined assessment that was developed based on peer-reviewed evidence of validity and reliability (Longmuir et al., 2018). It consists of knowledge-based questions and assessments that measure physical fitness.

The CAPL-2 was developed based on a large database of more than 10,000 children who were assessed at 11 different sites. The reliability score of the CAPL-2 was strong (r=0.62 and 0.69 over 2- and 7-day intervals, respectively) (Longmuir et al., 2018). Validity was assessed from the Delphi panel regarding content that should be included. The Delphi panel included 19 experts with 10-40 years of research within their field, who utilized a combined 4181 peer-reviewed publications to come to a consensus on which material was necessary for the questionnaire (Longmuir et al., 2018).

The CAPL-2 was modified to only include physical literacy questions. Physical fitness was not an outcome measure of this quality improvement project, so those questions were eliminated for this implementation. The modified CAPL-2 consisted of four multiple-choice questions and one fill in the blank paragraph with 5 blanks. Each question is worth one point,

with each correct response receiving one point and an incorrect response receiving zero points. The maximum score is 5 and the minimum score is 0.

The KAN-Q has been assessed to assist in the development of supplemental nutrition assistance program educational tools (LeGros et al., 2017). The questionnaire is reliable, valid, and practical. The internal consistency was adequate. Cronbach α was 0.71 for nutrition and physical activity behavior and 0.72 for nutrition and physical activity knowledge (LeGros et al., 2017). Overall, Cronbach α was 0.73 (LeGros et al., 2017). The test-retest reliability was acceptable, as the ICCs fell within the fair to excellent range (0.40-0.70) (LeGros et al., 2017).

The Kids' Activity and Nutrition Questionnaire (KAN-Q), consists of 25 questions specifically designed to measure physical activity, physical activity knowledge, and nutritional knowledge in children. The questionnaire has two primary and secondary scales. The primary scales and secondary subscales are behaviors of nutrition and physical activity and knowledge about nutrition and physical activity. The questionnaire begins with three demographic questions and of the next 12 questions, nine questions pertain to food frequency and three activity frequency. There are three nutritional and one physical activity knowledge questions. Lastly, the questionnaire ends with six questions designed to measure attitudes about nutrition.

The demographic questions are not scored. The nutritional knowledge questions are multiple-choice, and they are worth 1 point, with 4 being the maximum score and 0 being the minimum. The behavior or frequency questions were scored based on the number of times the task was completed, and the pre- and post-tests were compared to see if healthy behaviors increased and less healthy behaviors decreased. For the knowledge measure, the multiple-choice questions from both the CAPL-2 and the KAN-Q were added together to create a total of 9 questions, worth one point each. There is a maximum score of 9 and a minimum score of 0.

Data Analysis

Quantitative data analysis has been completed to determine the effectiveness of the quality improvement intervention T-tests were used to compare the pre- and post-intervention knowledge. Time spent physically active before the intervention was compared to time spent physically active at the end of the intervention using descriptive analysis and paired t-test.

Results

The average and median physical activity and nutritional knowledge score on the pre-test was 4 points out of 9, or 44%. The pre-test revealed that before the intervention the participants were active for at least 60 minutes, on average, 3.4 days per week. According to the pre-test, before the intervention, the participants consumed 1 serving of white bread per day, <1 serving of whole grains per day, 2 servings of fruit per day, and <1 serving of vegetables per day. On average, the participants were consuming one sugary beverage per day, while consuming an average of 3 servings of water per day. Between television and video games, the participants averaged between 2 to 3 hours of screen time per day.

After the intervention, the average physical activity and nutritional knowledge score was 5.7 points out of 9, or 63%. The average days spent physically active for at least 60 minutes per week were 5.89, with the most frequent response being 7. The participants reported an average of <1 servings of white bread per day, 2 servings of whole grains per day, nearly 2 servings of vegetables per day, and 3 servings of fruit per day. The participants consumed an average of less than 1 sugary beverage per day and more than 4 servings of water per day. Reported average screen time after the intervention was 1.3 hours per day.

When comparing the pre-test scores to the scores after the intervention, the physical activity and nutritional knowledge score increased by 19%. The days with at least 60 minutes of

physical activity per week increased by more than 2 days per week. Servings of white bread per day decreased from 1 to less than 1 per day, servings of whole grain increased from less than one serving to 2 servings, servings of vegetables increased from <1 to almost 2, and servings of fruit increased from 2 to 3. The average consumption of sugary beverages decreased from 1 serving per day to less than 1 and water consumption increased from 3 servings to 4 servings. Screen time decreased from between 2 and 3 hours to less than 1.5 hours per day. See Appendix C

Discussion

Childhood obesity is a disease that comes along with lifelong repercussions for every stage of life. The literature shows that increasing knowledge and physical activity is an effective way to combat childhood obesity. Facilities such as the one where this intervention took place still lack a program in which nutritional knowledge, physical education, and physical activity are used to decrease the prevalence of obesity.

The specific aims of this implementation were to enhance nutrition knowledge in each participant by 20%, to improve knowledge about physical activity in each participant by 20%, and to increase the time spent in physical activity to at least 60 minutes per day, three days per week. The implementation was successful at increasing knowledge, but with a 19% increase the target of 20% was not met. However, the days physically active for at least 60 minutes increased to an average of 6 days per week.

Along with the intended outcome measures for this quality improvement project, there were some unintended results as well. Servings of unhealthy food and drinks, such as white bread and sugary beverages, decreased while consumption of fruits, vegetables, and water increased. Screen time also decreased when comparing screen time before the implementation versus after the implementation.

Although the quality improvement project only met one of the specific aims, some of the results are not statistically significant. For nutritional and physical activity, the results were not statistically significant, (p-value = 0.064). However, for the days with at least 60 minutes of physical activity, the results were significant (p-value is 0.04). Moving forward, more quality improvement projects such as this one should be done to determine if the combination of increasing nutritional knowledge, physical activity knowledge, and physical activity is an effective way to combat childhood obesity. Future studies should focus on longer implementations, measuring BMI, and expanding the setting.

Limitations

There were limitations to this project, some that were accounted for and others that were not. The first limitation was participants' absences from programming throughout the implementation (i.e., due to day passes, family visits, and field trips). Only one participant attended every session. Six participants missed one session, and two participants missed two sessions. Participants missing more than two sessions were not included in data collection. The strict schedule that is followed at the facility also limited the amount of time we could utilize for this intervention, as the children have school, individual therapy, and group therapy sessions that they must attend on a routine basis.

Another limitation of this implementation is that it took place in a controlled environment, therefore it may not be as feasible or as successful to implement this program in other settings and environments because of the need for a location with space and materials, transportation, and a kitchen area. One last limitation that should be noted is the limited number of participants. The sample size is not very large to extrapolate data.

During the last week of the intervention, the children were on spring break. The children had more free time for physical activity. This likely helps to account for the higher than usual number of days with physical activity, as the facility planned activities for the children over the course of the break, such as skating trips and a volleyball tournament. The timing of the post-test could also account for the increase in fruits, vegetables, and grains. The post-test focused on servings of food the children consumed the day prior to the test, which included food consumed during the nutrition portion of the intervention. During that intervention, children took part in creating healthy snacks and consuming extra servings of fruits, vegetables, water, and dairy which could skew results on the post-test.

Ethical Considerations

This quality improvement proposal was submitted to the University of Louisville IRB as a quality improvement project, in December 2023.The intervention received approval from the Division Director, Vice President of Residential Programming, Child Psychiatrist, and Primary Care Provider at the inpatient residential facility. Parents or guardians were notified of this quality improvement project and consent was obtained in written format for each child that participated. All data collected were de-identified for privacy and stored safely in a locked filing cabinet at the data analysis site. Information was only transported from the facility to the data analysis site and has only been in the possession of one person.

As with any quality improvement project, there was risk of unintentional harm. One such harm includes self-esteem problems for those who are included, as they may feel as if they are being targeted for their weight. There are also self-esteem risks with those not included, as those children may feel left out. To address risks of unintentional harm to those that are included in the quality improvement project, the project dispelled negative effects by relying on a positive

approach that focused on increasing knowledge and physical activity time rather than decreasing weight. There were also incentives, such as healthy snacks, included for participation to help create a positive association for those who took part in the quality improvement intervention.

Conclusion

Obesity is a complex health issue, and it will take a multifaceted approach to combat its effects. Obesity is not only widespread but also causes a multitude of subsequent health issues. The findings of this quality improvement project support the literature. This intervention proved to be a successful way to increase knowledge and physical activity. While this quality improvement project could be useful moving forward, more research should be done using BMI as an outcome measure, to determine if physical activity and nutritional education are capable of combatting obesity and elevated BMI.

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Appendix A

Budget

Item	Cost
Printer Paper: $8.49 (500 Sheets) • **1 packet**	**$8.49**
Food Products (approximated)	**$250.00**
Paper Plates 100 Ct	**$9.99**
Time ($33 X 18 hours)	**$594.00**
Total	**$862.48**

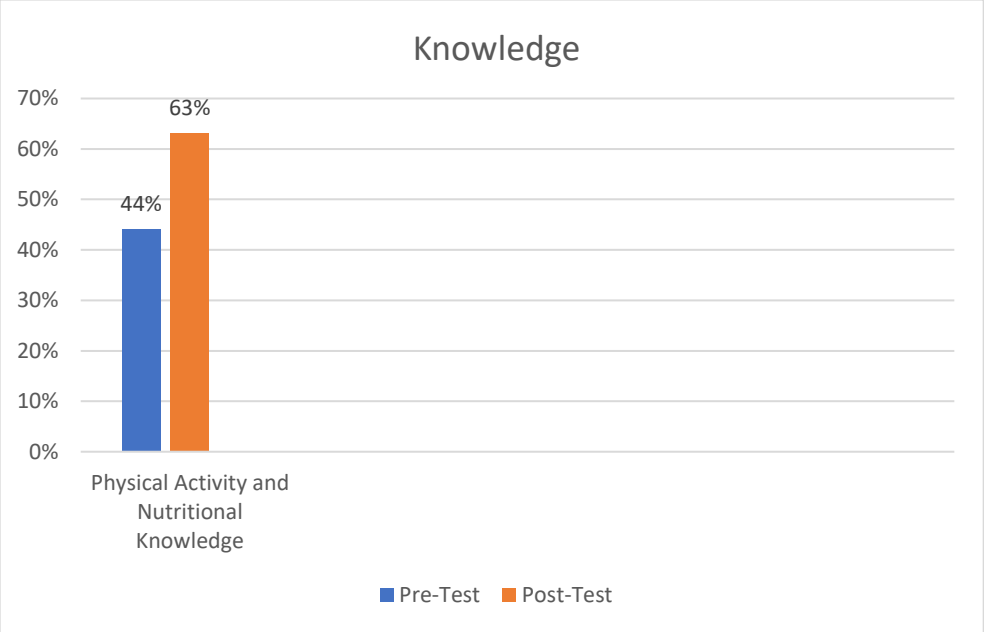
Appendix B

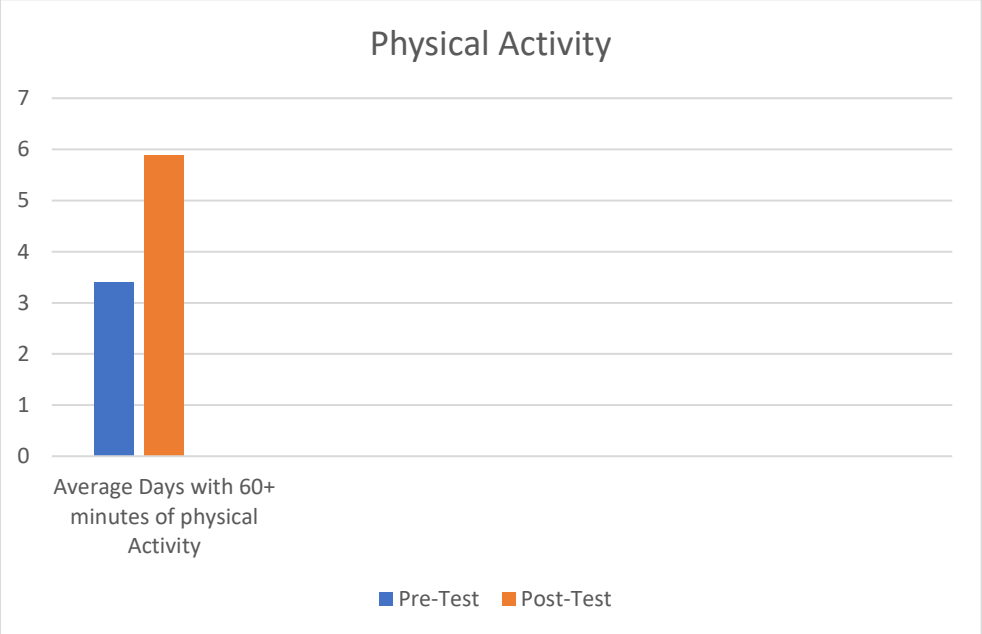
Weekly Agenda

	Physical Activity		Nutrition	
	Day 1 Education	Day 1 Knowledge Application	Day 2 Education	Day 2 Knowledge Application
Week 1	• 5-2-1-0 • Time to spend being physically active	• Dance as exercise • Balloon volleyball or balloon tennis	• Food groups (fruits, vegetables, grains, protein, dairy) • Definition and examples of each category	• Fruit and cheese Kabobs
Week 2	• Benefits of fitness and health • Defining Health	• Simon says. • Spell your name workout	• Portion Education • Recommended servings from each food group • Food pyramid • Importance of each meal	• Rainbow fruit toast
Week 3	• Muscular strength and endurance • Ways to increase muscular strength and endurance	• Resistance training • Dice exercise (each number represents different resistance exercise)	• Measuring • Reading nutrition labels	• Apple nachos
Week 4	• Cardiorespiratory fitness • Ways to increase cardiorespiratory fitness	• Jumping Jacks • Jogging in place	• Carbohydrates, fats, proteins, vitamins, and minerals- what they are and what foods they are in • The way food changes your body	• Fruit Pizza Crackers

Week 5	• Mindfulness • Stretching • Warm up and cool down	• Yoga • stretches	• Benefits of healthy eating • What food does to your body and development	• Banana Sushi
Week 6	• Putting it all together- wrap up. • Recap and review previous education	• UNO exercise (each color represents exercise, number is reps)	• Putting it all together- wrap up. • Recap and review previous education	• Kiwifruit salad waffle cones

Appendix C


Knowledge
70%
60%
50%
40%
30%
20%
10%
0%
44%
63%
Physical Activity and Nutritional Knowledge
Pre-Test
Post-Test


Physical Activity
7
6
5
4
3
2
1
0
Average Days with 60+ minutes of physical Activity
Pre-Test
Post-Test