

**The Effects of a Zumba Fitness Dance Program
on Children Struggling with Obesity**

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Abstract

The purpose of this study was to determine whether a Zumba fitness dance program can address childhood obesity in elementary public school programs. A quasi-experimental, pre/post-test design format was used to conduct the study testing an intervention within an elementary school setting. The intervention that was utilized was the Zumba dance fitness exercise program. The Zumba fitness dance program was a total body workout using various dance moves to burn calories and decrease body fat. The Omoron HBF-306C Body Fat Loss Monitor was used to determine the overall body fat percentage of each student. The data was collected after a four-week intervention program, and indicated a significant decrease in body fat percentage amongst 14 participants.

CHAPTER I

INTRODUCTION

Overview

The background of obesity among children has been extensively researched and tracked in many areas in order to identify, explore and implement positive change. The potential factors creating the problem, and the subsequent blame society places on such causes, demonstrate the need for more continuous study and exploration of effective interventions. According to the U.S Center for Disease Control (CDC), childhood obesity has been a growing concern and an increasing struggle for the U.S government for decades. Surveys conducted by the CDC, spanning the last 30 years, show that the prevalence of obesity among 30% of school-aged children increased in all age ranges by 300% (2012). The CDC findings indicate obesity is more often diagnosed among African-American, Native American and Hispanic youth as well as children who are members of low-income families (2012). With the advances and increases in technology, commercialization, materialism and access to unhealthy food over the last 30 years, childhood obesity has become extremely pervasive.

This pervasiveness of extremely overweight youth has become a mounting concern with serious medical and psychological implications and consequences. The impact of obesity in the life of a child can be destructive. Some obese children may suffer from depression or anxiety and are at risk of developing further mental health concerns later in life such as low self-esteem, low self-image and/or low self-worth. It is often adults, working in positions that force interaction with children daily, that the identification of this problem arises. Educators, doctors, and stay-at-home parents are often the groups that actively identify and strive to create interventions to address this problem. The increase of the noticeably obese children at a local

elementary school triggered personal concern with this issue. Furthermore, the lack of participation and support for physical education programming in schools also inspired personal interest in this problem. The completion of this study and potential permanent implementation of an effective intervention were the genesis of this researcher's interest.

Statement of Problem

A after school intervention program plan can address childhood obesity in an elementary public school setting.

(Null) Hypothesis

Participation in the Zumba Dance Fitness Program will not decrease the body fat percentage of students.

Operational Definitions

The Independent Variable was an exercise program utilizing the Zumba Fitness Dance training technique.

The Dependent Variable was body fat percentage, measured via the Omoron Body Fat Loss Monitor instrument.

CHAPTER II

LITERATURE REVIEW

This literature review discusses how childhood obesity has become a major issue in today's society and what intervention programs can help alleviate some of the weight problems children encounter. The introduction to the review will describe what a healthy child looks like (healthy weight, height and developmental milestones). The first section will examine childhood obesity, measuring the prevalence of childhood obesity to determine who is at risk. The second section will explore some challenges children face by being obese. Finally, the last section will analyze what can be done to aid children in becoming health oriented, as well as ways to establish a wellness lifestyle.

A Healthy Child

In early childhood, body development increases at an alarming rate of the first two years (Buiten & Metzger, 2000). On average, children grow two to three inches in height and gain about five to seven pounds in weight each year. Boys are likely to be larger than girls at this age because of their muscular structure. As a child's baby-fat drops off, he/she becomes thinner and leaner. During early childhood children are inclined to be very physically active. Running, jumping and skipping are some of the gross-motor developments during these early stages of life. As children's bodies become more streamlined and less top-heavy, their center of gravity shifts downward, toward the trunk; as a result, balance improves greatly, paving the way for new motor skills involving large muscles of the body.

Some of the major milestones in early childhood between the ages of five and six are increased running speed, galloping more smoothly and riding bicycles with training wheels. Buieten and Metzger (2000) believe children's endurance level increases as they continue to be highly active and eat what is recommended by the guided food pyramid. Good nutrition and

physical activities are important to the growth and development of young children. However, Jalongo (1999) believes parents in today's society have neglected the guided food pyramid and the results are reflected in early childhood obesity.

Prevalence of Childhood Obesity

In order to determine some of the issues affiliated with obesity, it is important to define obesity and discuss its prevalence. By definition, childhood obesity is a serious medical condition that affects young children. This condition occurs when a child is well above the required weight for his/her age and height. This unfortunate disease can lead to other health problems that will be discussed in the following section. With the intention of determining if a child is obese, one must track methods that qualify patterns of obesity. Generally, doctors use a BMI (Body Mass Index) measurement to determine childhood obesity. Age, gender and height-growth charts based on BMI aid doctors in determining the overall obesity level for children older than one year of age (Gable & Lutz, 2000). This allows an accurate analysis to determine a child's weight condition. Furthermore, most children in this country are suffering from overweight issues because of their eating habits. In addition to poor eating habits studies show children today spend more time watching television and playing video games as opposed to going outside and engaging in physical activities. The research suggests children need to participate in physical activity 30 minutes a day, allowing children's metabolism level to increase and enabling them to maintain a healthier lifestyle.

Childhood obesity is an issue facing many children in America with an increase in prevalence in certain areas of the country (Catherine, 2004). Childhood obesity occurs due to several factors. Gable and Lutz (2000) explain these factors to be prenatal, genetic, familial, and environmental. Parents are the main influence on childhood obesity. Research indicates that parents' food selections are related to demographic characteristics of the family. Since these

children are too young to make their own choice of what to eat, parents decide about providing the unhealthy foods and portion sizes which create cravings for sweet and starchy foods. In addition, as children get older they are influenced by their parents or guardians' way of life style which further simulates the same unhealthy habits. The importance of familial and environmental influence is underscored by the recognition that childhood is a critical period for shaping the dietary and life-style behaviors that can have implications for adult heart disease. Unfortunately, children from low-income families are the most susceptible to this condition. Among U.S. low-income preschool children between 1983 and 1995, an increase from 18.6% to 21.6% of children was considered obese (Hodges, 2003). African American and Hispanic children in particular are more likely to be obese. As Buiten and Metzger (2000) note "children at greatest risk for developing obesity are children from low-income families and children from African American and Hispanic origin" (p.13). Studies show that African American and Hispanic lack of education and financial stability impact poor decisions when nourishing their children.

Implications of Childhood Obesity

Childhood obesity is linked to several mental and physical complications. Childhood obesity had been associated with diseases such as hyperlipidemia (abnormally high concentration of fat or lipids in the blood), diabetes and hypertension to name a few (Gamble, Wadell, John, Catherine & Jeffrey 2012). Children often suffer from diabetes because of the high levels of sugar and starchy foods causing insulin levels to be extremely high. Some children have to take insulin shots prescribed by the doctor to maintain their sugar levels. Maintaining diabetes can be overwhelming for a child to manage because he/she must diligently maintain his/her blood levels. Overweight children have a 40% chance of contracting diabetes if their unhealthy habits continue into adulthood (Haboush, Phebus, Ashby, Montgomery & Kindig, 2011).

Hypertension is another disease that children often have to face if unhealthy eating habits continue. Hypertension is high blood pressure. The higher the pressure the harder the heart has to work to pump. Davidson (2007) points out “Primary hypertension in children has become increasingly common in association with obesity and other risk factors, including a family history of hypertension and an ethnic predisposition to hypertensive disease” (p.378). Hypertension can also lead to serious complications such as kidney failure, stroke and heart attack. Frequent visits to the doctor are mandatory for these common illnesses. Daily medication and change in diet are often required. Children who suffer from obesity experience not only physical difficulties but mental health problems as well. Low self-esteem is one of the many mental health concerns affiliated with childhood obesity. Obese children are at particular risk of low perceived competence in sports, physical appearance, and peer engagement. Studies show that young children in particular suffer with social interactions because of the negative comments from their peer. Children who tend to suffer from low self-esteem, furthermore, can fall into depression which is more severe. Gamble et al., (2012) clearly state “obesity and depression, conditions which have until recently been considered adult problems, are now recognized as common conditions among youths” (p.478). Children who have trouble controlling their weight tend to have issues socializing in public settings. These problems can last well into adulthood and may lead to serious illnesses such as alcoholism and drug addiction. Studies show obese boys and girls are more likely to be bullied and suffer from low self-esteem and depression than children who are not obese. Some studies indicate that depression and obesity are intertwined. Haboush et al., (2011) explain that obese children do not have the drive to eat healthy and play outside with friends if they are being teased and humiliated. Therefore, staying in the house watching television and eating becomes a way to escape their problems.

Prevention and Intervention Programs in Elementary School

Childhood obesity can affect the lives of children suffering from this common condition. Prevention and intervention programs within the school setting, however, can minimize some of the problems that exist with childhood obesity. Baskin, Zunker, Worley, Dial and Kimbrough (2009) point out that obesity prevention programs have become a national and international health priority as rates of child obesity have been increasing at an alarming rate. Studies show that there is a significant link between educational goals and overall students' health. Consequently, these researchers recognize factors related to successful obesity prevention programs include providing students with needed knowledge, attitudes, and behavioral skills to establish and maintain a healthy diet and engage in regular physical activities.

Research has also shown that school settings are one of the primary means of establishing health strategies to help prevent obesity in young children (Wang, et al.,2008). Moreover, children are inclined to participate in school related activities that involve their peers than activities outside of school. Nevertheless, Green, Riley and Hargrove (2012) believe that physical education classes may present problems for prevention of obesity. They explain that obese children may get frustrated because they struggle to keep up with their peers during physical activities. Obese children are inclined to isolate themselves during physical activities to avoid humiliation. Studies indicate that afterschool intervention programs allow children to participate in activities they find interesting. Simply telling a child to participate in an activity will not result in a successful intervention, however, allowing the child to select his or her own activity he/she will participate with interest.

Summary

The literature review clearly poses the problem with children suffering from obesity. It also explains that African Americans and Hispanic children are the most susceptible to this common condition. In addition, children from low income families often suffer from obesity because of poor food selections. The risk factors affiliated with this disease are an urgent health problem that needs to be addressed. Hypertension and diabetes are some of the health issues related to childhood obesity. Furthermore, children are suffering emotionally from obesity. Low self-esteem and depression are some of the concerns affiliated with obesity. Children isolate themselves to prevent humiliation and embarrassment. However, school programs addressing obesity preventatively will allow children to participate in physical activities and gain practical information about living a healthy lifestyle.

CHAPTER III

METHODS

Design

A quasi-experimental, pre-post-test design format was used to conduct this study testing an intervention within Baltimore City public schools designed to address the growing problem of childhood obesity. As a foundation for this design, a Zumba Dance Fitness Exercise Program was added to an urban elementary after-school program schedule as the independent variable. This study, taking place over the course of 4 weeks, involved specific measurable outcome including the dependent variable, body fat percentage. The study will compare the body fat percentage of students prior to taking part in the zumba exercise and upon completion of the program.

Participants

Students participating in the Zumba fitness dance program had to meet or exceed the average weight for their age group reported by the 2012 US Center for Disease Control (CDC) report for selection in this study. The participants consisted of fourteen African-American students including eight females and six males. Eight participants were eight years-old; two participants were nine years-old; four participants were ten years-old. All participants appeared to be overweight.

Instrument

The Omoron HBF-306C Body Fat Loss Monitor is a unique and innovative tool, utilized by exercise enthusiasts and athletic professionals alike, to obtain accurate body fat loss data.



The device (*shown above*) uses a formula including information pertaining to weight, age and gender along with the electric resistance of the fat tissue in the body to calculate specific and personalized body fat percentage. This is the instrument used in the JMESASP study to track and record the outcomes of the Zumba intervention program.

HealthCheckSystems.Org reviews devices and materials designed to effectively support overall human health. A 2011 review from that site of the Omoron HBF-306C praised the reliability of the monitor and rated it 4 out of 5 in accuracy of readings.

Procedure

The initial step in the procedure of this study focused on group structuring and the pre-test. Participants were also educated on health, fitness and nutrition facts. Students were encouraged but not required to maintain food journals, implement exercise with their families and learn to read and understand food labels. Educational handouts, permission slips and Zumba information materials were prepared ahead of time and distributed during the initial session. Secondly, participants were briefed on the details of the activity. This study is outlined as an after-school activity, held 3times weekly (Tues., Wed., Thur.) from 3:15pm-4:15pm. Finally, the group takes part in the 4-week long Zumba training program as outlined below, where weight is recorded and monitored for accuracy using the Omoron Body Fat Loss Monitor instrument.

Week 1:

During the three meetings of the first week the initial 10 minutes of the session, students warmed up- jogging, jumping rope and/or stretching to speed up their heart rates and increase their metabolism. Throughout the next 30 minutes of the session, students were focused on the correct techniques of the dance routines for Zumba fitness. Proper movement of the hips and arms were emphasized. Participants were encouraged to maintain flexibility- essential to the progression of Zumba fitness. Over the next 10 minutes of the session, students cooled down

using various stretching techniques to ensure the body recovered from the work out properly. Participants were taught that stretching the body parts used during the workout allowed their muscles to recuperate. During the final 10 minutes of the session, students were provided water and healthy snacks.

Week 2:

For the first 10 minutes of the sessions, students did jumping jacks and leg lunges to speed up their metabolism. During the next 30 minutes of the session, students were focused on the legs and buttocks. Dance routines consisted of squats and various waist movements, focusing on bending and reaching throughout the dance routine. For the next 10 minutes of these sessions, students did a light jog to slow down the heart rate. Participants were also taught dynamic stretches to relax their muscles. Through the last 10 minutes of this session, students were provided apples and oranges as a healthy snack.

Week 3:

Over the initial 10 minutes of week three sessions, participants focused on abdominal stretches to enhance flexibility in their core area. During the next 30 minutes of the session, students engaged in dance routines focused on the abdominal area. Participants were shown proper twists and turns with the hands placed on the hips allowing the children to focus on the three main sections of the abdominal area. For the next 10 minutes, students cooled down. Participants were taught that doing brief yoga stretching exercises helps the abdominal area recuperate. For the last 10 minutes of the week 3 sessions, students are provided water and a healthy snack.

Week 4:

Throughout the first 10 minutes of the final sessions, the students focused on total body warm-ups demonstrating what they learned about warming up over the course of the study. For the next 30 minutes, students viewed and participated in a video with a professional Zumba instructor,

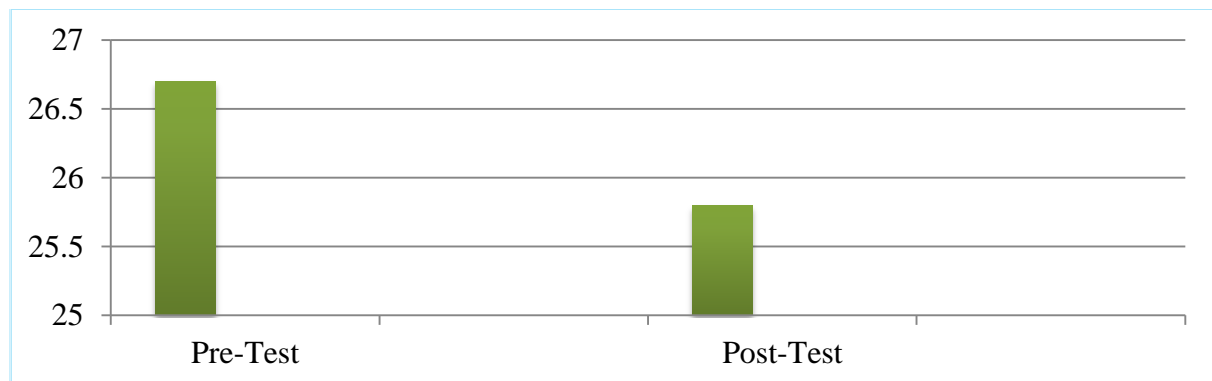
who focused on total body dance routines. The students used the last 3 sessions of Zumba training experience to complete the instructional video routine. During the next 10 minutes of the session, the video provided a cool down that focused on the total body movement. The students participated accordingly. The final 10 minutes of the week 4 sessions were spent with students receiving snacks and healthy drinks. The students were briefed on ways to eat healthy and exercise independently at home.

CHAPTER IV

RESULTS

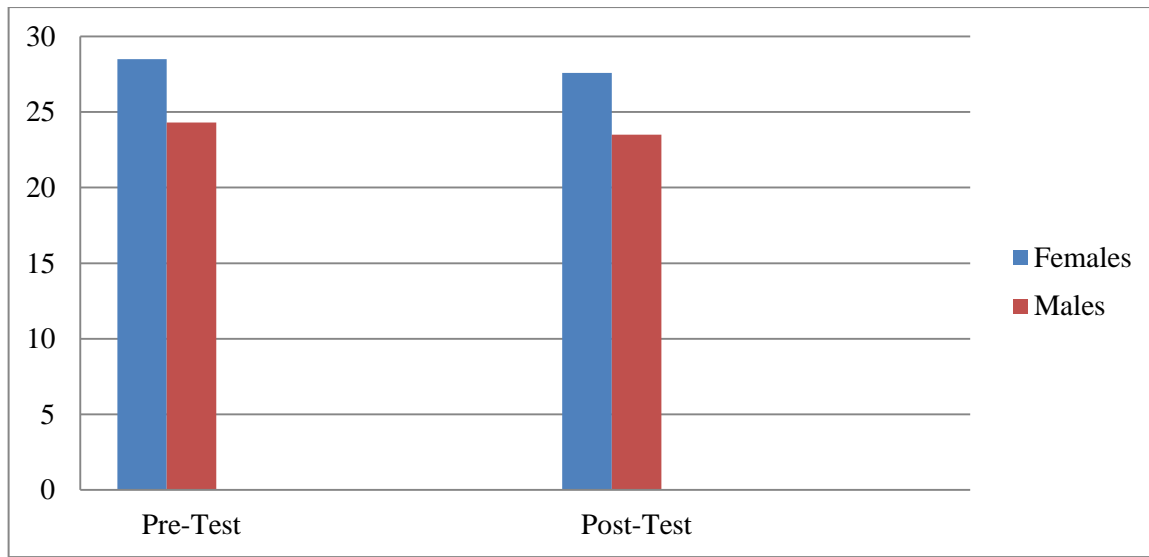
Analysis of the body fat prior to Zumba revealed a mean of 26, which significantly decreased to 25; $t(13) = 8.83, p < .05$. Figure One below shows the results of the participants and the difference in body fat during the study. Both Pre- and Post- test results were recorded using the Omoron Body Fat Loss Monitor. See Figure 1 below.

Figure 1. The Pre/Post Test for Body Fat Percentage of 14 Students.



Based on the overall results the researcher analyzed the findings by gender to demonstrate if there were differences. The analysis revealed a significant decrease from pre-test to post-test for females $t(7)=7.00, p < .05$. The analysis revealed a significant decrease from pre-test to post-test for males $t(7)=7.00, p < .05$. Yet that decrease in measure varied among the different sexes. The figure below shows the results of the participants and the difference in body fat during the study. Female students had 28.5% body fat on the pre-test which decreased to 27.6%. Male students had 24.3% body fat on the pre-test which decreased to 23.5%. See Figure 2 below.

Figure 2. The Pre/Post Test for Body Fat Percentage of Both Genders



Females have naturally higher body fat than males due to females having more fatty tissue. Because of this, the study shows that females' body fat loss was slightly higher than their male counterparts. The fatty tissue that females have adds to the percentage value however results indicate that both males and females decreased body fat percentage during the study. The results exemplify the significant decrease in body fat percentage among students participating Zumba.

CHAPTER V

DISCUSSION

Based on the analysis the null hypothesis was rejected; Zumba Dance Fitness decreased the body fat of student participants.

Implications of Results

The null hypothesis was outlined as participants in the Zumba Dance Fitness Program will not decrease the body fat. However, the findings rejected the null hypothesis. All students showed a significant decrease in body fat participating in Zumba for 4 weeks. The results indicate that Zumba Dance Fitness is an effective resource to utilize in school programs targeted at health education and weight loss. The results indicate that participation in a high impact aerobic activity leads to decreases in body fat percentage.

Theoretical Consequences

The results of this study indicated certain theoretical consequences related to childhood obesity and the onset of change in America and abroad. African Americans and Hispanic children are the most susceptible to this common condition – after-school programs such as this can greatly effect change among this population (Hodges, 2003). Often, children from low-income families suffer from obesity because of poor food selections and options, accessibility and affordability. Implementing exercise and fitness programs in after-school programming would be one of the best ways to help children transition to healthier living. Low self-esteem and depression are some of the concerns affiliated with obesity as well (Buiten and Metzger 2000). Children may isolate themselves to prevent humiliation and embarrassment; yet school fitness programs addressing obesity -actively and preventatively- will allow children to participate in physical activities and gain practical information about living a healthy lifestyle (Davidson,

2007). The results support the claim that after-school programs such as these, effectively help children lose weight.

Threats of Validity

One threat to the validity of this study is that the students that participated in the after school program were not randomly selected. Each of the participants were chosen for a reason and relating to a baseline criterion. Random selection provides more authenticity. Another threat should be identified as the condition that the students that were selected exceeded the average weight for their age group. This again, took away from this sample being average but more-so and evaluation of the selected population.

Connections to Previous Studies/Existing Literature

There are interesting similarities and differences between this study and other studies like it. For example, authors of the Education article, “Physical Activity and Childhood Obesity: Strategies and Solutions for Schools and Parents,” examined the amount of weight loss during a week’s long intervention (Green et al., 2012). This program also added exercise and fitness to the schedule however continued with the training 5-days per week for at least 15minutes each day. Another similarity among the two, was the willingness of the children to want to learn about healthier living and eating habits. Yet children in article provided the information to family members at home. During the Zumba study however, the children chose to not take information to their parents unless specifically asked. Another article by a group of researchers discussed a study conducted to place an initiative for obesity prevention within a low-resource school. That study also outlined a schedule of times and dates to do fitness training and also recorded body fat vs. body weight loss. However, more participants were used and that study took more time to complete (Baskin et al., 2009). The similarities and differences of this study to those conducted

before it demonstrate the need for an effective intervention that addresses the key issues of the problem.

Implications for Future Research

The study revealed many implications for future research. In order for children to learn to work exercise into daily living and develop healthy eating habits the program could have lasted much longer than 4 weeks and even perhaps be implemented as a rolling fitness program or Zumba club. This way the student feels consistently supported to stay the course and comprehends scheduling to notify family and invite family and friends. Another implication for future research is to use a larger population and potentially a randomly selected population, as well. Both of these factors will ensure that the intervention is reaching the most children. These will ensure all who want to participate- which essentially means those who already want to exercise and eat right- won't be turned away due to a number cut-off.

Conclusions/Summary

The idea of this study; to explore the background of obesity among children and implement positive change, has effectively been explored. The potential factors creating the problem, and the subsequent blame society places on such causes, demonstrate the need for more continuous study and exploration of effective interventions. With the advances and increases in technology, commercialization, materialism and access to unhealthy food over the last 30 years, childhood obesity has become extremely pervasive.

It is often adults, working in positions that force interaction with children daily, that the interest in this problem arises- including educators, Doctors and Stay-At-Home parents. These are groups that actively identify and strive to create interventions to address this problem. The increase of the noticeable obese children at a local elementary school triggered personal concern with this issue. Furthermore, the lack of participation and support for physical education

programming also inspired personal interest in this problem. The completion of this study and potential permanent implementation of an effective intervention has helped to solve the problem.

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