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Recognizing the risk of obesity in youth

Abstract

Participating in youth sports has major benefits for children; however, research has limitations about whether it has a positive effect on reducing the risk of obesity. A representative sample of boys and girls between the ages of 9-12 were examined to indicate whether participation in organized youth sport created a positive effect on the risk of obesity. Obesity is defined as the body mass index (BMI) of boys and girls between ages 9-12 is BMI ≥95th percentile (30+ BMI) & Overweight is BMI ≥85th percentile (25-29 BMI). Children who were sport participants and children who were non-sport participants were the subjects for the study. A sample size of 50 kids (children between ages 9-12 – 25 sport participants and 25 non-sport participants) was randomly selected at one city elementary school in Georgia. Over a one year span the subjects between ages 9-12 who participate in youth sports, 20 out of 25(80%) sport participants illustrated a greater variation of reduced obesity than only five children out of 25 (20%) who did not participate in youth sports were under the overweight, obese level. Data and research suggest participation in youth sports between the ages of 9-12 for boys and girls have a positive effect on reducing the risk of obesity. Supplementary variables also were used in the study such as diet of sport participants versus non-sport participants. Studies also indicated 20 out of 20 (100%) sport-participants between ages of 9-12 were more likely to consume vegetables, proteins, fruits and non-carbonated beverages versus non-sport participants between ages of 9-12 who consumed more carbonated beverages and fast food. Additional research will foster understanding of how participating in youth sports and a healthy diet can have a positive effect on reducing obesity.

Keywords: obesity, body mass index, sport participation

Volume 3 Issue 2 - 2019

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Received: May 14, 2019 | **Published:** June 21, 2019

Introduction

As of 2016 in the United States, approximately one in five school age children is overweight or obese.[1] Overweight and obesity has been a problem for many years. Lack of sport participation continues to be a benefactor for children in elementary school up to high school. Participating in youth sports or other forms of physical exercise can support children to maintain a healthy weight.[2] The National Council of Youth Sports approximates more than 44 million (56%) children in the United States participate in sport either on a school or community sport team.[1] The intention of youth sports is not solely intended on reducing the risk of a child being overweight or obese, but it is a setting in which children can be active on a regular daily basis. A study of public high schools researched that 29% of boys and 24% of girls are overweight.[2] To better understand the impact youth participation in sports has on overweight and obesity in children, previous research was systematically reviewed on scholarly resources relating sport and obesity using major determinants such as height, weight, body mass index (BMI) and dietary intake. Research in the current study is highlighted on random sampling of children who are sport participants and non-sport participants and researching their height, weight, BMI, sport/non-sport participant and dietary consumption in a one-year span.

Review methods

Children from ages 2-19 suffer from overweight and obesity and it is important for researchers to compile data to create a solution for this epidemic in the United States. The definition of "youth" in this research is directed towards children of ages 9-12. "Sport" is defined as school or recreational team in which practices and games are conducted on a schedule with a high degree of organization within each team. One limitation to consider with this variable is the lack of practice time and game time information for each child that was considered a sport participant. In terms of the children's "height", it was measured at the beginning of the study. "Weight" of each child was measured at the beginning of the study and at the end to see any type of fluctuation that may have occurred. In terms of determining the "overweight" and/or "obesity" of the child, it was verified and measured on a BMI Index Scale which uses height and weight to determine the ideal BMI index points (Appendix 1A). BMI in this research is defined as a measure of weight and height used to define weight categories for children between the ages of 9-12. Due to lack of external resources all children were measured the same on the BMI Index Scale (boys and girls) according to height and weight of each child. "Overweight" and "obesity" refers to children that are high on the BMI index and body weight is considered unhealthy.

Research focus

Research in this study will be primarily focused on 50 children between the ages of 9-12 using randomized sampling to select 25 sport participants and 25 non-sport participants at a city elementary school. The study will consist of weight, height, BMI index, sport participant/non-sport participant, and healthy/non-healthy diet over the course of a year. The population being sampled will be a population parameter. In the study, there are 27 boys and 23 girls used; the dietary variable is used to feed off of sport participant/non-sport participant and the effect it has on their weight.

Research limitations

There are many factors that lead to a child being overweight and/or obese in the United States. Such factors, limitation to the research, include technology, daily activity for sport participation, and growth spurts. Technology limitations to the study include but are not limited to: cell phone usage, television usage, and video game activity. Daily activity for sport includes lack of the following: monitoring of practices help with team, amount of time practice is conducted, outside of participation with team (extra activity/practice), and game

play for each child (some will play more than others). Growth spurt limitations between the ages of 9-12 are highly favorable and could influence the child's weight at a certain age or after a growth spurt is hit. Limitations in this study include a small sample being used with note that a future study would be conducted on a larger scale. It is also important to note that metabolism and gender differences between boys and girls at a young age must be undertaken. Lastly, it would have created more specificity in the study if a specific sport was utilized in the control grouping rather than "sport" and "non-sport" participants.

Research problem

Obesity has become an epidemic in the United States with children ranging from 2-19 years of age. There has been research conducted on what are the cause of obesity and overweight children and possible methods of improving the issue. In this particular case, research is conducted on 50 children who are sport participants and non-sport participants in determining if participation in youth sport can detour from becoming overweight and/or obese. Using a BMI Index Scale specifically created for this study; it will help illustrate the BMI (overweight/obesity) level of each child by studying height and weight of the child. It is also important in this study to consider whether or not dietary intake plays a role as a variable in reduction of obesity.

Research question

Does participation in youth sports for children ages 9-12 have a positive effect on reducing the risk of obesity?

a. Sub-question #1: Does diet play a role in a child's obesity level? Sport & Non-sport Participant?

Research aim

The research aim of this particular study is to research a random sample size of 50 children, 25 sport participants and 25 non-sport participants over a year span examining the positive correlation youth sport participation has on reducing obesity. The primary purpose is to help reduce obesity in children and find the benefactors in reducing obesity.

Hypothesis

Youth sport participation and dietary intake will serve as variables having a positive effect on reducing the risk of obesity in at least 60% of the sample size for children between the ages of 9-12. In the population parameter there is a 95% confidence level with a margin of error of +-3%.

Research methodology

This is a random sampling of 50 children between ages of 9-12 from a city elementary school in Georgia surveyed for an academic year span. The 50 children are divided into sport participants and non-sport participants in hopes of proving if participation in youth sports helps reduce the risk of obesity. The dependent variable is obesity level that is determined by the BMI Index chart (Appendix 1A) which illustrates the index of each child and how many of each age are in each BMI index. The independent variables consist of participation in youth sport along with the diet of the child. These two main points are what we are looking as the benefactors for determining if it can reduce the obesity of a child. Sport participation through the research of the children is considered an explanatory variable while the obesity rates in the children is a response variable. Further quantitative research would be needed to determine the hourly exercise per day and week the sport participants are involved in. For this particular study we will examine the central tendency of each child's weight, height and BMI level, illustrate the findings, compute a single t-test and determine the overall results for the study along with future implications for research. The ultimate goal for this research study is to find a correlation between participation in youth sports and a healthy diet reducing the risk of obesity. Central tendency will benefit from the purpose of this study in discovering the mean weight, height and BMI index for the children. The standard deviation has also been calculated as the weight, height and BMI index for children. It will help in determining how the results differ from the mean.

Results

Sport Participants

20 out of 25 (80%) sport participants reduced obesity

Diet

20 out of 20 (100%) sport participants who reduced obesity ate HEALTHY

5 out of 25 sport participants (20%) DID NOT EAT HEALTHY - OBESE

Non-sport Participants

5 out of 25 (20%) non sport participants were under obesity level

Diet

5 out of those 5 (100%) ate HEALTHY

20 out of 25 (80%) DID NOT EAT HEALTHY

20 out of 25 (80%) non-sport participants were considered to be obese or overweight

The results above indicated that the hypothesis was proved to be correct of having at least 60% of the children improve from participating in youth sports. The results indicate 20 out of 25 (80%) of sport participants were considered to be under the overweight and obese levels on the BMI index according to their height and weight. In terms of the diet for sport participants, all 20 children who was found to reduce obesity by participating in youth sport were also healthy eaters, 20 out of 20 (100%) sport participants who reduced obesity had a healthy diet. In the non-sport participants; 5 out of 25 (20%) were under the obesity level meaning 20 out of 25 (80%) of non-sport participants were overweight or obese. The 5 children who were not obese, 5 out of 5 (100%) ate a healthy diet while 20 out of the 25 (80%) did not healthy. Please refer to attached appendix 2A for the chart with each child's weight, height, BMI and central tendencies.

In the single t-test, for the purpose of this study, the two variables: weight at start and weight at end of the study of the children used for the study. In the single-test the p-value came out to be 0.42 (Excel calculation) which is greater than 0.05 proving that the measurement was not significant. The mean of weight differences did not affect the BMI index levels (Table 1).

In the one-way ANOVA test of weight from the start to end weight and BMI index it concludes that the null hypothesis of $H_o=\mu1\neq\mu2\neq\mu3$ stating that all means are not equal is rejected and the H1: Alternative hypothesis of at least 2 means are equal is verified due to the following:

F Value=163.2 > F critical value of 3.14 & P-value is less than 0.05 therefore the null hypothesis is rejected and the alternative hypothesis of two means being equal is accepted (Table 2).

Table 1 t-Test, Two-sample assuming equal variances

	Weight start	Weight end
Mean	74.18181818	75.54545455
Variance	174.4415584	183.6883117
Observations	22	22
Pooled variance	179.0649351	
Hypothesized mean difference	0.05	
df	42	
t Stat	0.350371503	
P(T<=t) one-tail	0.363905538	
t Critical one-tail	1.681952357	
P(T<=t) two-tail	0.727811076	
t Critical two-tail	2.018081703	

Table 2 Analysis of variance: single

Groups	Count	Sum	Average	Variance		
Column 1	22	1632	74.18182	174.4416		
Column 2	22	1662	75.54545	183.6883		
Column 3	22	468	21.27273	29.16017		
Source of variation	**SS**	**df**	**MS**	**F**	**P-value**	**F crit**
Between groups	42142.9091	2	21071.45	163.2223	1.2E-25	3.142809
Within groups	8133.09091	63	129.0967			
Total	50276	65				

Research incorporated a One-Way ANOVA to compare the means of weight at the beginning, weight at the end and the BMI index scale. It was the best method to prove the relationship with all three means.

Conclusion

The purpose of this study was to examine how youth participation in sport and a healthy diet can associated with a BMI index can positively help reduce the risk of obesity. Results revealed sport participants and children with a healthy diet are less likely to be overweight and/or obese. The results indicated that 20 of the 25 sport participants reduced the risk of obesity with all 20 of those children consuming a healthy diet. The non-sport participants, only 5 of the 25 were under the obesity level with all five of those children consuming a healthy diet.

Numerous parties are responsible for reducing the risk of obesity in America's youth including: parents, teachers, coaches, and researchers. Parent's primary responsibility is to love, nurture and ensure their child grows into a healthy cognitive teenager then adult. By allowing a child to lie around, eat whatever he/she wants and not get any form of exercise, it is hurting that child currently and will have an effect on him/her for the rest of their lives. A teacher's responsibility is to teach and actively involve each child in a learning and mindful environment. Teachers also have the responsibility in choosing snack and allowing recess for the children which can have an effect on obesity. Coaches have the responsibility in youth participation and making it an enjoyable experience for each child. It is not about running till they puke or sitting around doing nothing; it is a happy medium of fun, learning and exercise for each child improving. It is the researcher's job to research benefits and negatives in obesity; what are the main contributors to children being obese? What are the benefactors in reducing the risk of obesity in children? In this study, we conclude that youth participation in organized sport is a positive contributor to reducing the risk of obesity. Dietary intake is also a positive contributor in reducing obesity and helping a child lose weight and feel healthy. Future research will need to be conducted on quantitative methods of number of hours participation in sport or even exercise can contribute to helping a child. Research will continue to play an important role in reducing the risk of obesity and discovering new methods of sampling.

Acknowledgments

None.

Conflicts of interest

The authors declare there is no conflict of interest.

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