

# **Influence of Exercise on Obese Children 6-12 Years in Enugu South Local Government Area of Enugu state, Nigeria.**

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**ABSTRACT:** Social environment or life style of an individual is created through the different social activities around him and it could affect his nutritional status. Exercise is a life style that could have positive influence on obesity. Overweight and obesity in children are increasingly becoming public health concern in the world. Obesity is a risk factor for many chronic non-communicable diseases like type 2 diabetes, high blood pressure, heart diseases and some cancers. The study assessed the effect of physical exercise on weight of obese children 6-12 years in Enugu south Local Government Area (LGA) of Enugu State, Nigeria.

A preliminary study was conducted on school children 6-12 years in Enugu south LGA of Enugu State, Nigeria, to determine those who are obese. A total of 60 children representing 49.6% of the 121 obese children identified were randomly selected for the study. The children were divided into test and control groups (n = 30) based on body weight. Test group was subjected to physical exercise (jogging, dance aerobics, rope skipping, handball and football) 2 hours a day for 8 weeks. The control group had no physical exercise. Weight measurements of the children were taken at baseline and endline of the exercise.

The test group had a weight decrease of 9.88% while the control group had 7.2% weight gain. The females in the test group had a weight decrease of 9.68% while the males had 11.84% decrease. There was 8.09% and 6.37% weight increase in the female and male children, respectively in the control group.

Physical exercise reduced obesity in the school children and should be encouraged in children as a way of fighting obesity.

**KEYWORDS:** Obesity, Physical exercise, School children

## **I.INTRODUCTION**

The marked rise in children obesity prevalence has coincided with a major change in how children spend their time, resulting in both a decrease in physical activity and a rise in sedentary behaviour.

Obesity has been recognized as a medical disorder since the time of Hippocrates when it was stated that "Corpulence is not only a disease itself, but the harbinger of others (1). For most of human history, mankind struggled with food security with the onset of the industrial revolution, it was realized that the military and economic might of nations were dependent on both the body size and strength of its soldiers and workers. Height and weight thus both increased through the 19th century in the developed world. During the 20th century, as populations reached their genetic potential for height, weight began increasing much more than height, resulting in obesity (2). In the 1950's increasing wealth in the developed world decreased child mortality and increased body weight but as body weight increased, heart and

# International Journal of Innovative Research in Science, Engineering and Technology

*(A High Impact Factor, Monthly, Peer Reviewed Journal)*

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Vol. 7, Issue 10, October 2018

kidney disease became more common (3). During this same period, insurance companies realized the connection between weight and life expectancy and increased premiums of the obese (1).

Children and teenagers are becoming obese at an alarming rate. (4). The prevalence of childhood obesity in the world has risen dramatically in the past several decades with 25-30 percent of children being affected; it is not confined to the industrialized countries, as high rates are already evident in developing countries (5). All children gain weight as they grow older but extra pound more than what's needed to support their growth and development can lead to childhood obesity. Childhood obesity is a serious medical condition that affects children and adolescents. It occurs when a child is well above the normal weight for his or her age and height. Childhood obesity is particularly troubling and can be dangerous to one's health. The treatment of obesity in adults give disappointing results because, rebound weight gain within months is present in the vast majority of adults who loose weight, but behavioral interventions in children population may yield greater weight loss and better maintenance than in adults (6) (4) have recommended that making steady changes in eating and physical activity habits overtime, will bring about weight loss, better feeling and overall health improvement.

The study assessed the influence of exercise on the weight of children aged 6 -12 years living in Enugu State, Nigeria.

## II.LITERATURE SURVEY

The prevalence of childhood obesity has highly increased in several traditional populations. This is not only of social concern, it is also of public health concern, (7). Obesity is considered a disease and one of the key risk factors for many chronic non-communicable diseases, such as type 2 diabetes mellitus, high blood pressure, heart disease and some cancers. The most important long term consequence is their persistence into adulthood, with all the associated health risks (8).The rapid increase in childhood obesity predicts the future health consequences. The (8), reported that social and psychological problems are the most significant consequences of obesity in children. Furthermore, obese children may have psychological problems because the extra weight often place kids on the path to health problems such as diabetes, high blood pressure and high cholesterol that were once confined to adults. (9) reported that, obesity has so many complications. The glaring rise in childhood obesity forced the World Health Organization (WHO) to include childhood obesity on the list of essential health problems worldwide, and proposed it as the most frequent cause of preventable deaths, after smoking (10).

This rise is attributed to drastic changes in the lifestyle of the children. The dietary habits of the average Nigerian child in the urban communities had shifted from natural traditional foods to high-calorie foods (fast food and confectionary) which are relatively cheap and heavily promoted, specifically for children.

Exercise is no longer a regular part of daily activity. Some children never walked or cycled to school or play any kind of sport. Schools in the urban areas do not have enough open play ground for the children. This has promoted in door games such as video games for children in the schools in recent times. It is not unusual now for children to spend hours in front of a television or computer. (11) observed that 4 out of 10 boys and 6 out of 10 girls scarcely perform a minimum one hour daily physical activity recommended by the health education authority. The past generation was hard-working and produced hard-working children who maintained active life style and as such, did not have to deal with the issues and complications of childhood obesity (12). The growth of economy led children of affluent parents to have no interest in manual labour. This precipitates a society of children suffering from overweight and obesity. This is supported by several studies that observed that childhood obesity is increasing. The option available is a strategy to reduce and prevent it. It was in the light of this that this study emanated, to carry out an investigation on the prevalence of childhood obesity among children residing in the rural and the urban communities of Enugu South Local Government Area of Enugu State, Nigeria. The study provided evidence on prevalence of obesity in the communities and possible ways of controlling it.

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## III.METHODOLOGY AND DISCUSSION

A multistage stratified random sampling technique was used in selecting 10 schools and 2,000 children used for the study.. This was done by picking two hundred subjects comprising of boys and girls within the ages 6-12 years from each of the ten schools, by way of balloting without replacement. A structured questionnaire was used to collect information on the personal data, family background, parents' socio-demographic status, physical activity pattern of the family, monthly income range of the parents, health history and socio demographic characteristics of the children. Anthropometric measurements of weight, height and triceps were done. Physical exercise was carried out.

The physical exercise was conducted during the long term holiday period (July, August and September) when the children were available. A total of sixty (60) representing 49.6% of the obese children were randomly selected by balloting without replacement from the 121 obese children identified in this study and they were subsequently used for the exercise. Half (30) of the 60 children were further selected randomly for the exercise and the remaining 30 served as the control. A pediatrician was invited to examine the children before the commencement of the exercise to ensure their fitness in the programme, three sports experts were engaged to take the children on the various high energy activities, (jogging, dance aerobics, rope-skipping, handball and football). Initial measurement of weight, height and triceps was taken and their ages recorded. They were taken through the various activities for a time period of 2 hours which was divided among the 5 activities depending on the nature; the exercise was repeated daily for a duration of 8 weeks, except on Sundays'. Measurements were taken intermittently at the end of every 2 weeks within the duration, the total time spent on the activities was recorded and the final

weight of the intervention and control groups observed. The aim of the exercise was to ascertain the effect of physical exercise on the obese children as described by (13).

The children participated actively throughout the period of the exercise and results were recorded.

The physical exercise was performed using standard equipment and under the guidance of well trained sport experts, at a recognized sports centre (Liberty centre) in Enugu, Enugu State, Nigeria. The energy expenditure and the mean weight loss of the children were calculated. (14) was used to analyze the data. Information on anthropometric measurements and physical exercise were analyzed using frequencies and percentages and categorized using (15) Comparison was done using chi square test for categorized variables while ANOVA was used to analyze continuous variables. Anthropometric result showed that prevalence of childhood overweight and obesity in the Enugu South Local Government Area of Enugu State was 10.3% and 6.0% respectively.

## IV.RESULT

Result on physical exercise showed a significant weight loss by the children, initial mean weight was 59.06kg and final mean weight was 49.23kg, the mean weight loss was 9.52kg. The male children spent significantly longer ( $p < 0.05$ ) total time (46hours, 407minutes) relative to the female (45hours, 303minutes) on exercises. The body mass index (BMI) distribution of the children after the exercise activity showed that the percentage of obese children dropped from (100%) to (47%) while in the control group, there was no effect except for one child that moved from obesity to overweight. This shift could be as a result of the awareness campaign ongoing, about the health complications of obesity. The intervention group reduced significantly ( $p < 0.05$ ) in obesity and overweight than the control group. Conclusive evidence has shown that high energy physical exercise had a positive impact on the obese children in terms of weight loss.

**Table1:** Shows the influence of exercise on weight loss of the children ( $n=30$ ). The children spent a mean total time of 2757.93 minutes on the various exercises they participated. Male children spent significantly longer ( $P < 0.05$ ) total time (2784.44min) relative to the female (2718.17min) on the exercises. There was a significant ( $P < 0.05$ ) Table weight loss by the children (initial weight = 59.06kg and final weight = 49.23kg). The mean weight loss was 9.52kg. There were variations in the weight loss of all the children (3.11kg for males and 2.16kg for females).

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**Table 1: Influence of exercise on weight loss of the children (n=30)**

	Total time spent	Initial weight	Final Weight	Weight loss
<b>Male</b>	2784.44±95.02	62.89±11.21	52.39±5.62	10.50±3.11
<b>Female</b>	2718.17±67.15	55.23±15.08	46.70±4.12	8.53±2.16
<b>t-value (P-value)</b>	2.23(0.03)	1.51(0.15)	0.63(0.54)	0.58(0.57)
<b>6-8 years</b>	2749.14 <sup>a</sup>	53.66 <sup>b</sup>	45.60 <sup>a</sup>	8.06 <sup>a</sup>
<b>9-10 years</b>	2767.13 <sup>a</sup>	59.91 <sup>ab</sup>	48.11 <sup>a</sup>	11.80 <sup>a</sup>
<b>11-12 years</b>	2764.13 <sup>a</sup>	70.53 <sup>a</sup>	47.36 <sup>a</sup>	23.16 <sup>a</sup>
<b>F-value(P-value)</b>	0.12(0.89)	5.41(0.01)	0.11(0.90)	1.417(0.26)
<b>Combined</b>	2757.93±89.97	59.06±13.21	49.23±12.35	9.52±20.69

Values are mean ± standard deviation

Means with similar superscript in the same column were not significantly different (P>0.05)

Table 2 shows classification of body mass index (BMI) by sex of the children after the exercise intervention. The result showed that 55.6% of the male children were obese and 44.4% were overweight while 33.3% of the females were obese and 66.7% were overweight for the intervention group. Only 3.3% of the females in the control group was overweight while 96.7% remained obese.

**Table 2: Classification of BMI by sex of the children, (after the exercise).**

Classification of BMI	Intervention Group			Control Group		
	Male	Female	Total	Male	Female	Total
	F %	F %	F %	F %	F %	F %
<b>Obesity</b>	10(55.6)	4(33.3)	14(46.7)	20(95.2)	9(100.0)	29(96.7)
<b>Overweight</b>	8(44.4)	8(66.7)	16(53.3)	1(4.8)	-	1(3.3)
<b>Total</b>	<b>18(100.0)</b>	<b>12(100.0)</b>	<b>30(100.0)</b>	<b>21(100.0)</b>	<b>9(100.0)</b>	<b>30(100.0)</b>

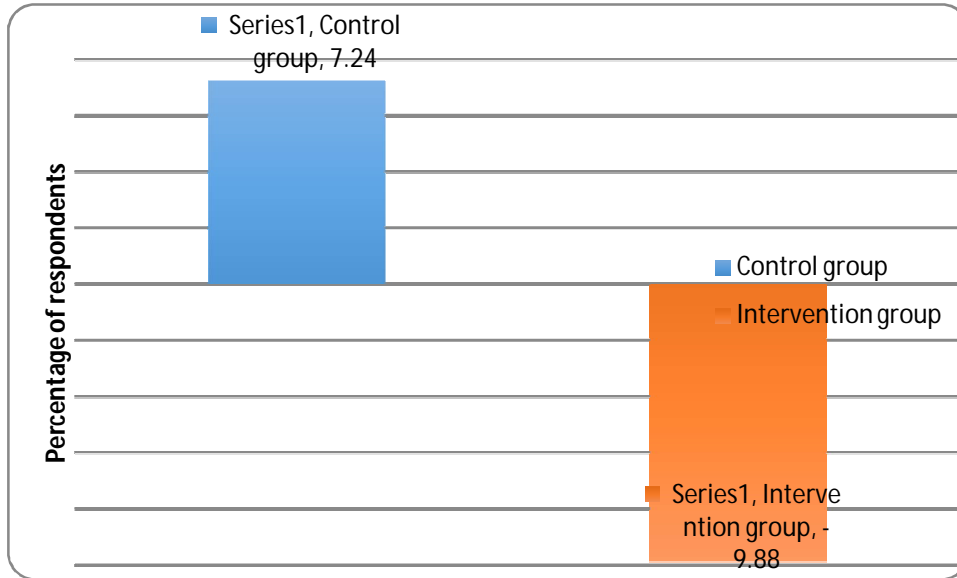
**Fig.1;** shows the mean percentage weight changes (increase/decrease) of the different groups for the period of 8 weeks. The control group had a weight increase of 7.24% while the intervention group had a weight decrease of 9.88%.

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Vol. 7, Issue 10, October 2018



**Fig.1:** Mean percentage weight changes (increase/decrease) of the different groups for the period of 8 weeks

Table 3 shows the influence of exercise on weight loss of the children (n=30). The children spent a mean total time of 2757.93 minutes on the various exercises they participated. Male children spent significantly longer (P<0.05) total time (2784.44min) relative to the female (2718.17min) on the exercises. There was a significant (P<0.05) weight loss by the children (initial weight = 59.06kg and final weight = 49.23kg). The mean weight loss was 9.52kg. There were variations in the weight loss of all the children (3.11kg for males and 2.16kg for females).

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Vol. 7, Issue 10, October 2018

## V. CONCLUSION

The role of physical exercise on the weight of the obese children was well recorded in this study. Initial weight of the children was (59.06kg) and final weight was (49.23kg). The mean weight loss was (9.52kg). The reduction in weight observed at the end of physical exercise further support the need to include physical exercise in the life style of children in addition to dietary modification.

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