Obesity and the Development of Complications Across the Life Span: Is there a Relationship between Obesity and Poverty?

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ABSTRACT

The purpose of this investigation was to examine the relationship between the development of obesity in children ages five to ten years, and poverty (the socio-economic status of the family). Because of the associated complications of obesity such as heart disease, stroke, diabetes and hypertension, this research aimed to determine if obesity, a precursor of these diseases, was related to poverty.

The rate of the development of hypertension and diabetes in children and young adults has been steadily increasing over the past ten years (Hines, Fishman, Green, 1999). Therefore, there is an urgent need for continued investigation exploring the multiple variables associated with the development of this major health hazard. The goal of this research was to examine the following objectives: Investigate the relationship between poverty and obesity in children age 5 to 10 years, determine the genetic risk for subjects meeting the criteria for obesity, and communicate findings of this research via referred publications and presentations.

The methods used in this research involved collection of secondary and primary data. Secondary data collection involved retrieving information on subjects assigned to the free lunch program, based on household income. Primary data collection included weight, height and Body Mass Index (BMI) of the subjects. Height, weight and BMI were recorded and compared with normal values for age and height, thus determining obesity status. The results of obesity status were correlated with household income.

Thirty three subjects (N=33) were studied. The results of the study showed no significant relationship between obesity and poverty. However, the incidence of obesity in the sample according to body mass index was a finding that warrants further investigation. The results showed a higher level of obesity among the subjects who were not from households meeting the definition of poverty.

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The purpose of this investigation was to examine the relationship between the development of obesity in children ages five to ten years, and poverty (the socioeconomic status of the family). In particular, the proposed effort investigated the relationship between obesity in children from poverty households and children from non-poverty households. Poverty is defined for this research as a family of four with an annual income of eighteen thousand eight hundred-fifty dollars ($18,850) or less (U. S. Department of Health and Human Services, 2004). It is well established through research that obesity is a major health problem (US government, 2003, Centers for Disease Control, 2003). Along with the health problem of obesity comes the development of other life threatening disease processes such as diabetes, heart disease, hypertension and stroke (National Institutes of Health Consensus Development Conference Statement, 1991). The estimated number of deaths per year attributed to obesity and the complications that follow is reported to be nearly two hundred and eighty thousand (280,000), (Allison & Fontaine, 1999). Obesity is on the verge of surpassing smoking as the leading cause of preventable deaths, and is therefore a salient factor in increased cases of disability. The cost of obesity to states within the United States has reached seventy-five billion dollars (American Obesity Association, 2002).

Statement of the Problem

Children of today have become less active. Physical education has been taken out of many schools, and recess may or may not mean outdoor activity. After school

activities are relegated as time to play games that require no physical activity, or just to watch the television. The diet of Americans has changed drastically too. Much of it is due to fast foods, foods prepared outside the home, and the food choices made by children at school. There is evidence that under-nutrition may also be related to the development of obesity (Olson, 1999). It is imperative that there is continued investigation on multiple variables that may be related to obesity. Continued investigation and exploration into the phenomenon obesity may lead to discovery of interventions to assist in a decrease or elimination of the disease and its associated complications.

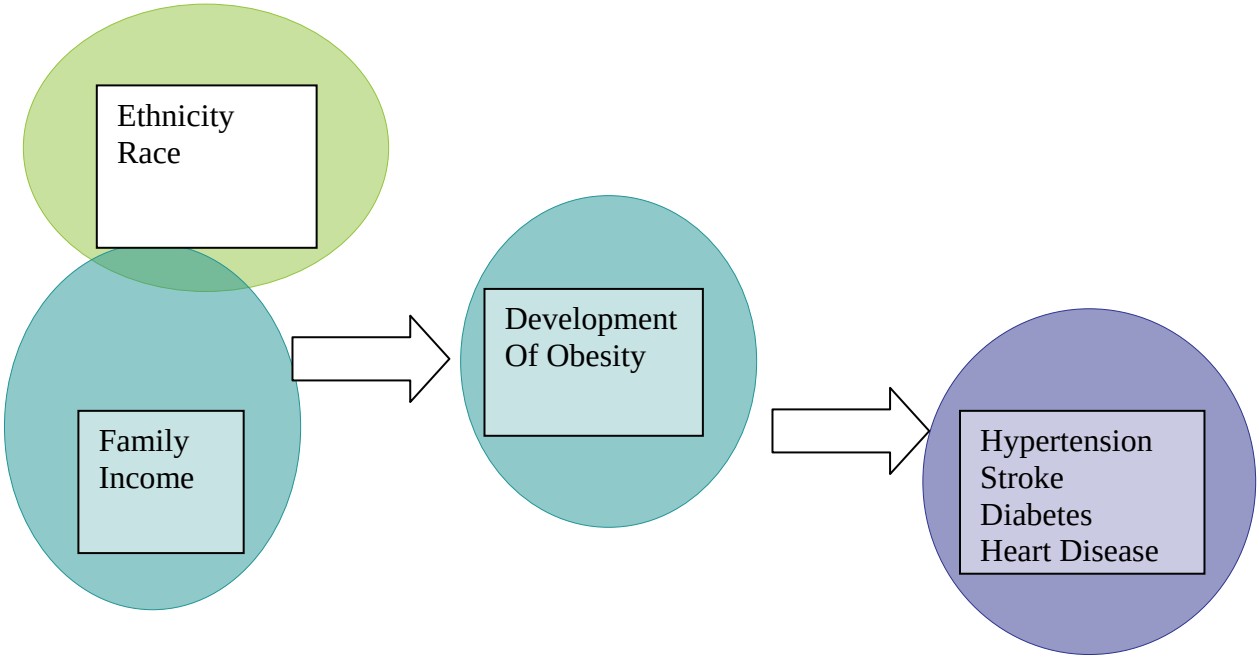
This research project focused on children ages five to ten in a school where income of households are across a continuum of standards; at or below poverty standards to incomes that are above the poverty standard. The aim of this study was to determine if a relationship exist between poverty and the development of obesity.

Rationale

This research is important because it will provide critical information regarding poverty and the development of obesity. Society thinks of obesity as a disease that occurs because individuals eat too much. Sometimes that may be true. However; one may be obese because of the lack of nutritious food intake or the ingestion of the wrong kinds of foods. From a physiological prospective, the body will metabolize foods more slowly when it feels that it is not getting nutrients it needs to maintain homeostasis (Huether & McCance, 2004). Early identification of variables associated with obesity is significant in the development and implementation of interventions that could enhance child development through improved nutrition, exercise and socialization.

Conceptual Framework

The Conceptual Framework used to guide this research utilized ethnicity, family income, the development of obesity and the complications of obesity as a backdrop.



Obesity/Poverty Conceptual Model

Obiectives:

1. Investigate the relationship between poverty and obesity in children age 5 to 10 years.

3. Determine genetic risk factors for subjects meeting the criteria for obesity.

4. Communicate the finding of the proposed research in referred journals

Literature Review

In 1992, obesity was documented in 33.4% of the population in the United States. Data indicates that children are becoming less active and spending more time in activities that require sitting. This change in behavior has produced increased obesity in children (US Department of Health and Human Services, 1995). The number of school children involved in daily physical education showed a decrease of 17% from 1991 to 1995 (US Department of Health and Human Services, 1996). Since 1975, obesity in children age 6-11 increased 54% (Foreyt & Goodrich, 1995). Minority populations and the poor may be particularly affected (Kuzmarski, Flegal, Campbell & Johnson, 1994).

Obesity is strongly associated with heart disease, diabetes, hypertension, and stroke (National Institutes of Health Consensus Development Conference Statement, 1991). Ethnic minorities, especially African Americans are afflicted disproportionately with diseases associated with obesity, and have higher morbidity and mortality (Feldman & Fullwood, 1999, Stonks et al., 1998). A strong predictor of the development of obesity is race, particularly in females of African decent (Townsend, Peerson, Love, Achterberg, & Murphy, 2001). In the United States, African-Americans have disproportionate numbers of poor, unemployed, and disadvantaged individuals, who lack access to health care systems. More than 50 million people in the United States have hypertension (Oparil,1996). Among African-Americans, the prevalence rate for high blood pressure is about 32%, which is the highest when compared to other ethnic groups (Ailinger, 1988). Approximately 2.3 million or 10.8% of all African-Americans have diabetes, however, one-third of them are unaware of the condition. Stonks, Van de Mheen, & Mackenback (1999) found that in adults, low income had adverse affects on health. Low income was

associated with the development of diet related chronic diseases such as coronary artery disease, hypertension, type 2 diabetes and obesity.

Is it that children from poverty stricken environments are at more risk for the development of the health problem obesity, than children who are from non-poverty environments? The complications of obesity such as diabetes, hypertension, and heart disease, carry with it the possibility of the loss of limbs, loss of sight, and loss of speech, paralysis and perhaps even more profound disabilities.

The rate of the development of hypertension and diabetes in children and young adults have been steadily increasing over the past ten years (Hines, Fishman, & Green, 1999). Therefore, there is an urgent need for continued investigation seeking the multiple variables associated with the development of this major health hazard.

Procedure

Permission to complete this project was obtained from the Institutional Review Board from Florida A&M University. A statement of protection of human subjects was included in the informed consent signed by the parent.

The Principal of the targeted school gave permission to the school secretary to address envelopes and send documents provided by the Primary Investigator, home with the subjects. The Primary Investigator took the letters, informed consent and the family history sheet to the secretary. The secretary addressed the envelopes and sent them home with the subjects. The secretary collected the documents from the students and the Primary Investigator collected the documents from the secretary. Once consent was obtained the Primary Investigator coded the documents with numbers. The Secretary and the Primary Investigator were privy to the subjects' names. The Primary Investigator

arranged with the School Secretary an appointment to collect additional data. The data included the subjects' height and weight. Data were collected on two separate days. In a private room, the Primary Investigator computed the Body Mass Index based on the height and weight of the subject. Data related to subjects receiving breakfast and free or reduced lunch at the school were obtained from the student's records and/or the parent completing the demographic tool.

FINDINGS

Description of the Sample

Thirty three (n = 33) subjects between the ages of five and ten, from an elementary school in northeast Florida were studied. Fifty-one point five percent (51.5%) of the sample were male and forty eight point five percent (48.5%) were female.

Sex of child

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	17	51.5	51.5	51.5
	female	16	48.5	48.5	100.0
	Total	33	100.0	100.0	

Forty-five point five percent (45.5%) of the sample were not on free and reduced lunch. Fifty-four point five percent (54.5%) of the sample were on free or reduced lunch.

On subsidized lunch program

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not on lunch program	15	45.5	45.5	45.5
	On F/R lunch	18	54.5	54.5	100.0
	Total	33	100.0	100.0	

The age of the subjects ranged from five to ten years. The greatest percent of the subjects were between the ages of five and seven years.

Age of child

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5 through 7 year olds	13	39.4	39.4	39.4
	8 year olds	10	30.3	30.3	69.7
	9 and 10 year olds	10	30.3	30.3	100.0
	Total	33	100.0	100.0	

The subject's height in inches ranged from forty-three to sixty-two inches. The subjects who were fifty six inches in height comprise the greater portion of the sample.

Height in inches of the child

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	43	2	6.1	6.1	6.1
	46	2	6.1	6.1	12.1
	48	5	15.2	15.2	27.3
	49	1	3.0	3.0	30.3
	50	1	3.0	3.0	33.3
	52	2	6.1	6.1	39.4
	53	4	12.1	12.1	51.5
	54	2	6.1	6.1	57.6
	55	3	9.1	9.1	66.7
	56	6	18.2	18.2	84.8
	57	1	3.0	3.0	87.9
	58	1	3.0	3.0	90.9
	59	1	3.0	3.0	93.9
	62	2	6.1	6.1	100.0
	Total	33	100.0	100.0	

The weight of the subjects ranged from forty-four pounds to one hundred eighty-one pounds. The majority of the sample weighed from forty four to seventy pounds

Weight in pounds of the child

Weight	percent
44 to 70 lbs.	36.2
71 to 99 lbs.	30.1
100 to 180 lbs	33

Body Mass Index (BMI) ranged from 13.98 to 37.54. More than half the sample had a BMI of 13.98 to 21.20. This statistic shows that some of the sample had a BMI lower than normal for height and age.

Body Mass Index

BMI	Percent
13.98 to 21.20	54.1
21.52 to 27.68	30.5
30.72 to37.54	15.4

Forty-eight point five percent (48.5%) of the sample had no one in the family with diabetes. Fifty one percent (51%) of the sample had at least one family member with diabetes. Therefore, more than half the sample is at risk for the development of diabetes. Sixty-six point seven percent (66.7) of the sample had no one in the family with hypertension. Thirty three point three percent (33.3%) of the sample had at least one person in the family with hypertension. Therefore, a third of the sample is at risk for the development of hypertension.

Sixty seven percent (67%) of the sample had no one in the family with history of stroke. Thirty three point three percent (33.3) of the sample had at least one person in the family with a history of stroke. Therefore, one third of the sample is at risk for the development of a stroke. Seventy nine percent (79%) of the sample had no one in the family with heart disease. Twenty one point two percent (21.2%) of the sample had at least one person in the family with heart disease.

Independent Sample T-Test ; Levene's Test for equality of variances, and t-test for equality of means showed no significant difference between free or reduce lunch (poverty) and Body Mass Index (obesity).

Independent Samples Test

Levene's Test for Equality of Variances	F	Sig.
Age of child	2.303	.139
Height in inches of child	.001	.979
Weight in pounds of the child	.430	.517
Body Mass Index	.045	.833

t-test for equality of means	T	df	Sig. (2-tailed)	Mean Differences
Age of child	1.414 1.370	31 24.413	.167 .183	.689 .689
Height in inches of child	.794 .784	31 28.195	.433 .439	1.356 1.356
Weight in pounds of the child	.972 .957	31 27.749	.339 .347	13.333 13.333
Body Mass Index	.835 .834	31 29.792	.410 .411	2.00833 2.00833

Discussion

The sample (n=33) for this study was very small. One hundred forms were sent to parents. Very few responded saying that the child could not participate. Most of the parents did not respond at all. The response was very disturbing, particularly because of efforts being made to include the most vulnerable population in investigations. It is disturbing because of the problem of obesity and it rampage to the point of becoming an epidemic. If the sample had been larger and less homogenous, perhaps the findings would have been different. Therefore, it is recommended that the study be repeated and be ongoing with the subjects at risk for the development of complications.

The Primary Investigator has made arrangement with the School Principal to meet with the Parent Teacher Organization to present the findings of the study, and discuss strategies to assist the subjects and families at risk.

Based on the findings, the evidence is clear that obesity is found in this age group. It is reasonable to predict that the subjects at risk have a high probability of developing diabetes, hypertension and maybe heart disease.

A finding of no relationship between obesity and poverty alludes to the idea that being poor has nothing to do with the development of obesity. More study is needed to look at additional variables that may be related to obesity. It behooves the nation to tackle the problem with more vigor. Health Care Providers, in particularly Nurses are in a poised position to make a major difference with strategies of health promotion, through the use of theory based practiced related to obesity.

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