



**A CASE CONTROL STUDY ON FACTORS CONTRIBUTING TO  
OBESITY/OVERWEIGHT AMONG SCHOOL CHILDREN.**

- 1. Mrs. Himali Prajapati, (Research Scholar, P P Savani school of Nursing, P P Savani University, Surat, Gujarat)  
ORCID NO- 0009-0005-6834-7515**
- 2. Dr.M.Jayalakshmi (Professor cum Research Supervisor,P P Savani school of Nursing, P P Savani University, Surat, Gujarat)  
ORCID NO-0000-0002-6874-6808**

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**ABSTRACT:**

“A Case Control study on factors contributing to obesity / overweight among school children at selected schools of Gandhinagar, Gujarat state”. Case control study design was used for the study. The setting for the study was selected school at Gandhinagar. The sample for the present study includes 60 school children. The sample size was arbitrarily decided to 30 cases and 30 controls. purposive sampling technique was used to select cases and controls for study. the cases and controls were allotted based on BMI. The tool consisted of two sections. Background data of school children and Selected contributing factors of obesity. The data collected were edited, tabulated, analysed and interpreted by SPSS version. The findings revealed The findings revealed that 28(93.33%) of school children in the cases and 4(13.33%) in the controls had high risk of contributing to obesity and there was significant association with the cases at the level of  $p=0.05$ . The risk for developing obesity in cases is 7.15 times that of the controls.

Key words: Body mass Index, children, contributing factors obesity

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**INTRODUCTION**

The term obesity is derived from the Latin word "Obsess" which means having "eaten until fat". It is usually defined as an excess of body fat and is often seen as an imbalance between energy intake and expenditure. Obesity is a state in which there is generalized accumulation of excess fat in the body leading to the body weight more than 20% of the required weight whereas overweight is a state in which there is generalized accumulation of excess fat in the body leading to the body weight of more than 10% of required weight. Obesity is the consequence of a long term imbalance between energy intake and energy

expenditure determined by food intake, physical activity and influenced by biological, societal and environmental factors. Obesity may have several short term consequences like social discrimination, lower Quality of life, increase cardiovascular risk factors and disease, like asthma and the long term consequences are persistent of obesity, increased morbidity, and higher prevalence of cardiovascular risk factors in adulthood and also cause important economic burden. Obesity should therefore be prevented as early as possible. For establishing effective intervention, it is important to identify major determinants in the early stage of life. Childhood obesity is a serious medical condition that affects the 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 because the extra pounds often start children on the path to health problems that were once confined to adults such as diabetes, high blood pressure and high cholesterol. Childhood obesity can also lead to poor self-esteem and depression. The prevalence of childhood obesity is increasing rapidly worldwide. It is associated with several risk factors for later heart disease and other chronic illness including hyper lipidaemia, hyper insulinaemia, hypertension and early atherosclerosis. Their risk factors may operate through the association between child and adult obesity, but they may also act independently. In worldwide controversy is going on regarding childhood obesity. Obesity is reportedly increasing in India. The investigator seen many overweight and obese children among all the income group peoples and wonder about the causes of obesity among them. so interested to do this research on the topic of childhood obesity.

## **METHODOLOGY**

Case control study design was used for the study. school children with exposure to selected factors of obesity is considered as a case group and without exposure to factors of obesity as a control group. The investigator is intended to study the level of exposure to the factors of obesity in both groups. The setting for the study was selected school at Gandhinagar. The sample for the present study includes 60 school children. The sample size was arbitrarily decided to 30 cases and 30 controls. purposive sampling technique was used to select cases and controls for study. After screening the school children, the cases and controls were allotted based on BMI.

Ethical consideration: Parents of the children were given a full explanation about the purpose of the study assurance about the confidentiality of the information and that the participation was optional.

**Inclusion Criteria**

1. School children who had body mass index more than 25 (Obese).
2. In the age of 10-14 years.
3. From both sex.
4. Who are available in selected schools at Gandhinagar.
5. Children who are willing to participate in the study.

**Exclusion Criteria**

1. School children suffering from psychiatric illness.
2. Who had suffered from any illness for the past one month.
3. Children who had attended any teaching programme on obesity and obesity related factors.

The tool consisted of two sections:

Section 1: Background data of school children.

Section 2: Selected contributing factors of obesity.

**ANALYSES AND INTERPRETATION****SECTION A: DATA ON DEMOGRAPHIC VARIABLES OF THE SCHOOL CHILDREN**

Table 1: Frequency and percentage distribution of demographic variables of school children in the cases and controls. N = 60 (30+30)

Demographic Variables	Cases (30)		Controls (30)	
	No.	%	No.	%
<b>Age in years</b>				
10 - 11 yrs	06	20.00%	08	26.67%
11 - 12 yrs	07	23.33%	08	26.67%
12 - 13 yrs	09	30.00%	08	26.66%
13 - 14 yrs	08	26.67%	06	20.00%
<b>Sex of child</b>				
Male	10	33.33%	12	40.00%
Female	20	66.67%	18	60.00%
<b>Birth order of the child</b>				
First	25	83.33%	09	30.00%
Second	03	10.00%	15	50.00%
Third	02	06.67%	06	20.00%
<b>Type of family</b>				

Nuclear	12	40.00%	13	43.34%
Joint	16	53.33%	10	33.33%
Extended	02	6.67%	07	23.33%
<b>Residential area</b>				
Urban	14	46.67%	18	60.00%
Rural	16	53.33%	12	40.00%
<b>Religion</b>				
Hindu	11	36.67%	13	43.34%
Muslim	08	26.66%	07	23.33%
Christian	09	30.00%	03	10.00%
Others	02	6.67%	07	23.33%
<b>Educational status of father</b>				
Illiterate	06	20.00%	05	16.67%
Primary schooling	07	23.33%	07	23.33%
Higher secondary school	10	33.34%	09	30.00%
Degree and above	07	23.33%	09	30.00%
<b>Educational status of mother</b>				
Illiterate	05	16.67%	07	23.33%
Primary schooling	10	33.33%	06	20.00%
Higher secondary school	09	30.00%	10	33.34%
Degree and above	06	20.00%	07	23.33%
<b>Employment status of father</b>				
Employed	13	43.34%	10	33.33%
Unemployed	10	33.33%	04	13.33%
Self employed	04	13.33%	13	43.34%
Farmer	03	10.00%	03	10.00%
<b>Employment status of mother</b>				
Employed	10	33.33%	10	33.33%
Unemployed	13	43.34%	12	40.00%
Self employed	04	13.33%	05	16.67%
Farmer	03	10.00%	03	10.00%
<b>Economic status</b>				
Low income	08	26.67%	10	33.33%

Middle income	20	66.67%	12	40.00%
Upper income	02	06.66%	08	26.67%

It was inferred that among cases majority (30%) were in the age group of 12 – 13 yrs, (66.67%) were female, (83.33%) were first born child, (53.33%) belonged to joint family, (53.33%) were from rural area, (43.33%) were Hindus, (36.67%) of fathers were educated up to higher secondary school, (33.33%) of mothers were educated up to primary school, (43.34%) of fathers were employed, (43.34%) of mothers were unemployed and (43.34%) belonged to middle income group

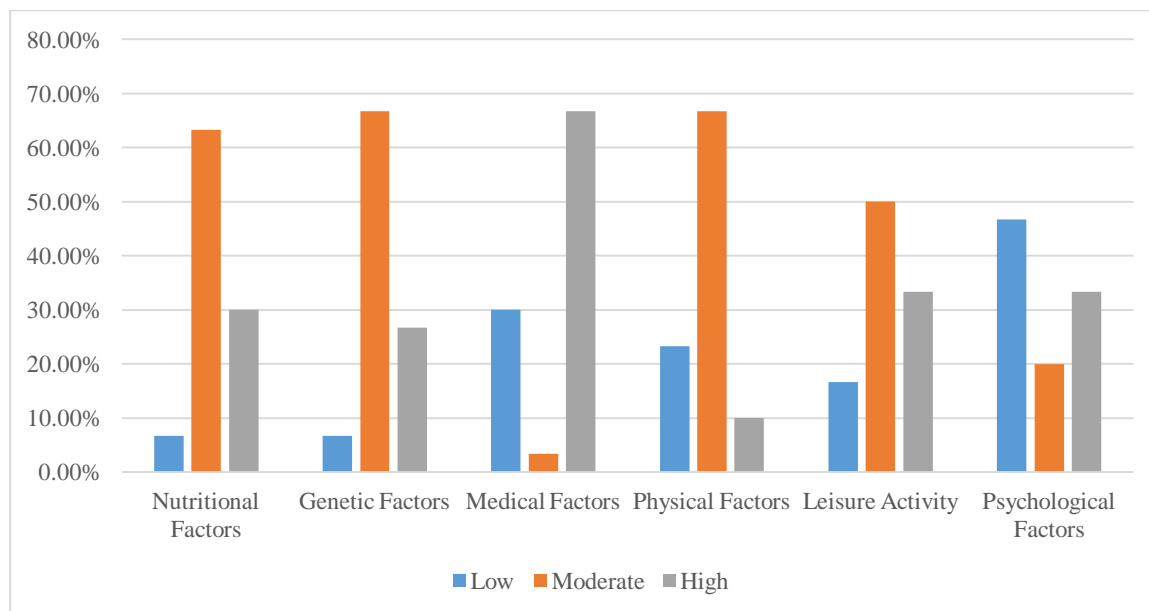
Whereas in the controls (26.67%) were in the age group of 12 – 13 yrs, (60.00%) were female, (50.00%) were second born child, (43.34%) belonged to nuclear family, (60.00%) were from Urban area, (43.34%) were Hindus, (30.00%) of fathers were educated up to higher secondary school, (33.34%) of mothers were educated up to higher secondary school, (43.34%) of fathers were self-employed, (40.00%) of mothers were unemployed and (40.00%) belonged to middle income group. Hence both the groups were comparable.

**SECTION B: DATA ON LEVEL OF FACTORS CONTRIBUTING TO OBESITY AMONG SCHOOL CHILDREN IN CASES AND CONTROLS.**

**Table 2: Data on level of factors contributing to obesity among school children in the cases. N = 30**

Factors	Low (>50%)		Moderate (51 – 75%)		High (>75%)	
	No.	%	No.	%	No.	%
<b>Nutritional Factors</b>	02	06.67%	19	63.33%	09	30.00%
<b>Genetic Factors</b>	02	06.67%	20	66.67%	08	26.66%
<b>Medical Factors</b>	09	30.00%	01	03.33%	20	66.67%
<b>Physical Factors</b>	07	23.33%	20	66.67%	03	10.00%
<b>Leisure Activity</b>	05	16.67%	15	50.00%	10	33.33%
<b>Psychological Factors</b>	14	46.67%	06	20.00%	10	33.33%
<b>Overall</b>	02	06.67%	21	70.00%	07	23.33%

It was inferred that the factors contributing to obesity among school children revealed that, majority 21(70%) had moderate level of contribution of all the factors, 7(23.33%) had high level of contribution of all the factors and only 2(6.67%) had low level of contribution of factors to obesity in the cases.



**Table 3: Data on level of factors contributing to obesity among school children in the controls. N = 30**

Factors	Low (>50%)		Moderate (51 – 75%)		High (>75%)	
	No.	%	No.	%	No.	%
<b>Nutritional Factors</b>	20	66.67%	09	30.00%	01	03.33%
<b>Genetic Factors</b>	17	56.67%	11	36.67%	02	06.67%
<b>Medical Factors</b>	21	70.00%	00	00.00%	09	30.00%
<b>Physical Factors</b>	28	03.33%	02	06.67%	00	00.00%
<b>Leisure Activity</b>	19	63.33%	09	30.00%	02	06.67%
<b>Psychological Factors</b>	29	96.67%	01	03.33%	00	00.00%
<b>Overall</b>	26	86.67%	03	10.00%	01	03.33%

It was inferred that the factors contributing to obesity among school children in control group revealed that, majority 26(86.67%) had low level of contribution and only 3(10.00%) had moderate level of contribution to obesity.

**Table 4: Mean and standard deviation of factors score contributing to obesity among school children in cases and controls.**

FACTORS	CASES		CONTROL	
	MEAN	SD	MEAN	SD
Nutritional Factors	9.53	1.68	5.33	1.4
Genetic Factors	1.5	0.8	1.17	1.0
Medical Factors	1.07	0.6	0.5	0.6
Physical Factors	2.73	0.9	2.17	0.8
Leisure Activity	2.93	0.69	1.7	1.0
Psychological Factors	2.73	1.2	1.43	1.0
<b>Overall</b>	<b>20.49</b>	<b>3.27</b>	<b>12.3</b>	<b>2.88</b>

It was inferred that the overall mean score of cases were high 20.49 compared to controls mean score of 12.3.

**SECTION C: DATA ON COMPARISON OF FACTORS CONTRIBUTING TO OBESITY AMONG SCHOOL CHILDREN BETWEEN CASES AND CONTROLS.**

**Table 5: Comparison of factors contributing to obesity among school children between the cases and controls.**

**N = 60 (30+30)**

Factors	Group	Level of Factors				Chi square test	Odds Ratio
		High		Low			
		N	%	N	%		
<b>Nutritional Factors</b>	Cases	28	93.33	02	06.67	$\chi^2 = 23.24$ df = 1 p = 0.05	28
	Control	10	33.33	20	66.67		
	Relative Risk	2.82		0.10			
<b>Genetic Factors</b>	Cases	28	93.33	02	06.67	$\chi^2 = 18.31$ df = 1	18.31
	Control	13	43.33	17	56.67		
	Relative Risk	2.16		0.12			

	Risk					p = 0.05	
<b>Medical Factors</b>	Cases	21	70	09	30	$\chi^2 = 5.44$	5.44
	Control	09	30	21	70	5.44	
	Relative Risk	2.33		0.43		df = 1 p = 0.05	
<b>Physical Factors</b>	Cases	23	76.67	07	23.33	$\chi^2 = 30.24$	46
	Control	02	6.67	28	93.33	30.24	
	Relative Risk	11		0.25		df = 1 p = 0.05	
<b>Leisure Activity</b>	Cases	25	83.33	05	16.67	$\chi^2 = 13.6$	8.64
	Control	11	36.67	19	63.33	13.6	
	Relative Risk	2.24		0.27		df = 1 p = 0.05	
<b>Psychological Factors</b>	Cases	16	53.33	14	46.67	$\chi^2 = 18.48$	33.14
	Control	01	3.33	29	96.67	18.48	
	Relative Risk	17.67		0.49		df = 1 p = 0.05	
<b>Overall</b>	Cases	28	93.33	02	06.67	$\chi^2 = 38.6$	91
	Control	04	13.33	26	86.67	38.6	
	Relative Risk	7.15		0.08		df = 1 p = 0.05	

It was inferred that 28(93.33%) of school children in the cases and 4(13.33%) in the controls had high risk of contributing to obesity and there was significant association with the cases at the level of p=0.05. about 91 times the factors contribute to obesity (OR = 91). The risk for developing obesity in cases is 7.15 times that of the controls.

## CONCLUSION

The findings of the study showed that the majority that 28(93.33%) of school children in the cases and 4(13.33%) in the controls had high risk of contributing to obesity and there was significant association with the cases at the level of p=0.05. about 91 times the factors contribute to obesity. The risk for developing obesity in cases is 7.15 times that of the controls.



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