ijcrr
Vol 03 issue 03
Category: Research
Received on:05/01/11
Revised on:04/02/11
Accepted on:11/02/11

ASSOCIATION OF LIFESTYLE PRACTICES AND DIETARY PATTERN WITH CHILDHOOD OBESITY AND THE IMPACT OF NUTRITION EDUCATION

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ABSTRACT

Childhood obesity has increased in both developed and developing countries although the pace and pattern differ from country to country. It has profound public health consequences, as seventy percent of the overweight children become overweight adults. The present study was focused on the prevalence of childhood obesity in selected schools of Kottayam district and to explore the association of obesity with variables like socio economic status, location of residence, birth weight of the child, nutrition during infancy and life style pattern. A total of 2216 children were selected from eight public schools which constitute 1008 boys and 1208 girls in the age group of 10 to 14 years. A well framed questionnaire was distributed to elicit details on demographic profile, life style and food consumption pattern. Height and weight was taken for all the children to identify the BMI and status of body fat. Of the total population 18 percent were obese, 14 percent were overweight, 56 percent were normal weight and 12 percent were underweight. The results of the study exposed the fact that the percentage of overweight and obese children are growing in Kerala also, like in the other states of India and globally. Obesity and overweight were seen more in girls and underweight seemed to be more in boys indicating an increasing trend in the percentage of obesity among girls compared to boys. In rural areas also an increasing trend of overweight and obesity was observed although underweight children are still prominent. So it was concluded that the increasing trend of the modern day epidemic of overweight and obesity in children calls for immediate action to reduce the incidence through appropriate nutrition intervention programmes involving school children, their parents and school authorities. If immediate measures are not taken the condition can lead to serious problems beyond repair.

Key words: Body Mass Index, obesity, nutrition education.

INTRODUCTION

Childhood obesity is an emerging pandemic of the new millennium. This has profound public health consequences, as 70 percent of overweight children become overweight adults (Sanjeev, 2009). According to Swaminathan (2005) a person whose body weight is higher than normal by 15-20 percent is considered as overweight and by 25 percent is considered as obese. Obesity is a major risk factor for many chronic

diseases, such as cardiovascular disease and diabetes. Moreover overweight and obesity exacerbate many chronic diseases. Obesity is a complex disease influenced by genetic and environment factors and their interactions. It is a major risk factor for metabolic diseases, each of which is influenced by their own specific genes and environmental factors (Butte, 2006).Obese children tend to be more isolated and have lower self-esteem than their peers. A systematic review of studies on the relationship between physical activity in children and obesity found that roughly half had no effect and the balance had a negative effect (that is increased physical activity level were protected).Many cross-sectional studies have looked at the association between television viewing and childhood obesity. Some found only a weak association, but most found a positive association in children all over the world. Snacking is gaining prominence as a potential risk factor for obesity as is skipping meals. Those who do not consume breakfast tend to eat a large amount of food in the evening, and this imbalance could lead to a higher risk of obesity. It has been shown that family structure including family size, birth order of the child as well as whether it is a single or joint parent family may have an effect on childhood obesity (Wang et al, 2007).

During the past two decades, the prevalence of obesity in children has risen greatly worldwide and this excessive fatness has arguably become a major health problem of both developed and developing countries. Overweight and obesity during childhood is a matter of growing concern in India also. Most individuals develop their eating and activity patterns during childhood. The transition in nutrition and life style by the popularity of fast foods, soft drinks, sedentary life style, lack of exercise, increased television watching and computer use are the common trends adopted by children today. These may be the causes of overweight seen in children of both rural and urban areas (Ramachandran, 2002). Kerala has made remarkable achievement on par with the developed countries in the field of women and children's health during the last few decades. However, overweight and obesity is a growing health concern in Kerala too; the consequences of which can cause disaster to the future generation (Geetha, 2003).Considering the threats of overweight and obesity in this cyber era, the present study is carried out in selected schools of Kottayam educational district among children between the age group of 10 to 14 years to see the extent of overweight, obesity and underweight among the children of Kerala. Keeping these in mind the study has been focused with the following objectives to:

- Identify the prevalence of obesity in selected schools of Kottayam district and study the socio economic status of selected school children,
- Explore the association of obesity with variables such as socio- economic status, infant nutrition, life style pattern, dietary habits and
- Find out the impact of nutrition education to the parents of obese children.

MATERIALS AND METHODS

Selection of Area:

Considering the good response, ease of communication and familiarity of the area the researcher selected eight private schools in Kottayam district of Kerala.

Selection of Sample:

A total of 2216 children both male and female in the age group of 10-14 years were selected for the study. Of these 1008 were boys and 1208 were girls. Since the age group selected for the study ranged from 10-14 years, all the students studying from 5^{th} standard to 9^{th} standard were selected for the study.

Conduct of Study:

In order to fulfill the objectives of the study a questionnaire was formulated to elicit the background information of the children. Anthropometric measurements were taken to identify the BMI and the status of body fat. A twenty four hour recall dietary survey was conducted for three consecutive days to understand the food consumption pattern of the selected children. Nutrition education was imparted to the parents of obese children during a Parent Teacher Association meeting conducted by the school authorities. Pamphlets, booklet and power point presentation were developed to impart nutrition education.

Formulation of questionnaire:

The framed questionnaire embracing the details of demographic data, monthly income, monthly expenditure pattern, dietary habits, details of food expenditure, consumption of junk foods, duration of television watching, extracurricular activities, duration of indoor and outdoor games, physical activity pattern, type and frequency of snacks and beverage consumption, food preferences of the subjects, type and amount of oil used in the family and heredity of obesity in the family and feeding pattern during infancy was formulated.

Anthropometric measurement of the subjects:

The height and weight of the subjects were taken by the standard procedure. From the recorded weight and height of the subjects, Body Mass Index (BMI) was calculated.

Body Mass Index (BMI):

Assessing pediatric obesity is not as straight forward as it may seem, but there is now a consensus that Body Mass Index (BMI) should be used for clinical practice and epidemiology. BMI values in children are much lower than in adults, and BMI changes with age. So BMI cutoffs to define obesity in adults are not appropriate for children. National BMI reference data are now available and are widely used and recommended.

>95th percentiles : **obesity**
86th -95th percentiles : **over weight**
5th -85th percentiles : **normal weight**
<5th percentiles : **under weight**

Designing a pamphlet, booklet and power point

A pamphlet, booklet and power point presentation was prepared on obesity focusing on its causes, complications, remedial measures, the importance of diet and behavior modifications in preventing obesity.

Administration of Nutrition Education

Nutrition education was administered by the following procedures.

Assessment of nutritional knowledge:

A pretest was conducted to test the nutritional knowledge of the parents of the selected obese children with special reference to functions and sources of nutrients and dietary pattern. The parents were asked to state true or false for the given questions. Every correct answer was given one mark and the scores were summed up.

Imparting Nutrition Education:

A study on the dietary pattern of children and the nutritional knowledge of the parents was carried out. The tools developed for education included a pamphlet, booklet and power point presentation.

Impact of Nutrition Education

The impact of nutrition education given by the investigator was analyzed after two months using questionnaire.

RESULTS

Food consumption in front of television

Most of the children prefer to have food in front of television. Table 1 shows the list of children who consumed food while viewing television.

Table 1 Food consumption and viewing television

Table 1 shows that when 17 percent of the obese subjects consumed food in front of the television, 6 percent of the normal weight samples did not. Normally the subjects consumed snacks and tiffin items in front of television. It was reported that children who viewed television consumed high fat food and fast food, drink more soft drinks and consumed fewer fruits and vegetables.

Type of play

Table 2 gives details about the type of play in which the selected samples were engaged.

Table 2 Type of play involved by the samples

Table 2 shows that when 14 percent of the obese subjects were interested in indoor games only 4 percent preferred outdoor games. It was also noted that 20 percent of the normal weight subjects preferred outdoor games and 5 percent of the underweight subjects preferred indoor games. Although the increase in childhood obesity is frequently attributed to a decline in physical activity and remarkable lack of consistency exists in the relation between level of physical activity and degree of fatness.

Family history of obesity

The details about the history of obesity in the family of the selected children is depicted in table 3

Table 3 Family history of obesity

Table 3 reveals the fact that 3 percent of the obese children's and 4 percent of the overweight subject's mothers were obese. Two percent each of obese, over weight and normal weight subject's fathers were obese. However 69 percent of the family members were found to be free from heredity factor for obesity. Studies have shown that the likelihood that a child will become obese in adulthood is markedly increased if either his or her parents are obese.

BMI of the subjects:

Body Mass Index (BMI) of the selected children is shown in table 4.

Table 4 BMI of the subjects

Table 4 clearly shows the fact that out of the 2216 children selected, 18 percent were obese and 14 percent were overweight. Fifty six percent and 12 percent of the selected children were of normal weight and underweight respectively. It was also noted that most of the obese subjects were from affluent families.

BMI of children with different food habits.

The details regarding the BMI of children with different food habits is depicted in table 5

Table 5 BMI of children with different food habits

From table 5 it was observed that 13 percent of the obese subjects were non vegetarians. It was also interesting to note that only two percent of the obese samples were vegetarians, while 37 percent of the normal weight children and seven percent of the underweight children were non vegetarian. Sanjeev (2009) from his studies also showed that the crowd in the restaurants and fast food centers can reveal the changing pattern of food intake among teenagers.

Feeding practices of the subject during infancy.

The details regarding the feeding practices of the subject during infancy is elicited in table 6.

Table 6 Feeding practices during infancy

It was clear that 5 percent of the obese children and 3 percent of the overweight children were not breast fed during infancy. This was because either due to the death or due to some illness of the mother. Ten percent of the breast fed subjects was under weight and 53 percent were normal weight. Breast feeding protects against obesity.

Parents' awareness about nutritional aspects

Table **7** gives a clear picture of the scores secured by parents of overweight and obese subjects in relation to various nutritional aspects.

Table 7 Parents awareness about nutritional aspects (N=567)

It was seen that before nutrition education 39 percent scored less than 10 marks and 47 percent scored between 10 and 20. Only a few percentages of 14 scored more than 20 marks. This clearly bring out the fact that majority of the parents were unaware about nutritional aspects. After nutrition education 56 percent of the parents scored between 20 to 25 marks. This indicated that there was a rapid rise in the nutritional knowledge of the parents. Obesity is easier to prevent than to treat and prevention focuses in large measure on parent education. In childhood, parent education should center on proper nutrition, selection of low fat snacks good exercise or activity habits and monitoring on television viewing.

DISCUSSION

The present study was conducted at eight schools of Kottayam district, to identify the prevalence of obesity in selected schools and to explore the association of obesity with other variables such as socio-economic status, location of residence, birth weight of the child, birth order of the child and feeding habits during infancy. A total of 2216 children were selected from eight public schools which constitute 1008 boys and 1208 girls in the age group of 10 to14 years. A well framed questionnaire was distributed to the children to elicit details on demographic profile, life style pattern, food consumption pattern, prevalence of obesity among the children, association of obesity with different variables and their nutritional knowledge. Height and weight for all the selected children were taken. Nutrition education was imparted to the parents of obese children during a Parent Teacher Association meeting conducted by the school authorities. Pamphlet and booklet was developed which was distributed to the parents. A power point presentation was also made incorporating all the necessary details regarding obesity. The results of the study exposed the fact that the percentage of overweight and obese children are increasing in Kerala also, like in other states

of India and globally. The study also showed that when obesity and overweight were seen more in girls and underweight seemed to be more in boys indicating an increasing trend in the percentage of obesity among girls compared to boys. In short the study showed an increasing trend of overweight in children particularly in girls of urban areas. In rural areas also an increasing trend of overweight and obesity was observed although underweight children are still prominent.

CONCLUSION

Childhood obesity is one among the primary priority programs of World Health Organization and is the most serious public health challenge of the twenty first century. The problem is global and is steadily affecting many low and middle income countries, particularly in the urban settings. It was concluded that the increasing trend of the modern day epidemic of overweight and obesity in children calls for immediate action to reduce the incidence through appropriate nutritional intervention programmes involving school children, their parents and school authorities. If immediate measures are not taken the condition can lead to serious problems beyond repair.

ACKNOWLEDGEMENT

The author expresses her profound sense of gratitude and heartfelt thanks to the principals of the various schools for permitting her to conduct the study. The investigator also acknowledges her gratitude to the physical educators of the schools for their systematic guidance, valuable co-operation and learned council during the study period.

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Table 1 Food consumption and viewing television

Food consumption	BMI GRADES (N= 2216)							
	Underweight		Normal weight		Overweight		Obese	
	No	%	No	%	No	%	No	%
Consume food Do not consume food	248 17	11 1	1094 137	49 6	287 21	13 1	370 42	17 2
Total	265	12	1231	56	308	14	412	18

Table 2 Type of play involved by the samples

Type of play	BMI GRADES (N= 2216)							
	Underweight		Normal weight		Overweight		Obese	
	No	%	No	%	No	%	No	%
Indoor games Outdoor games	112 153	5 7	781 450	36 20	227 81	10 4	316 96	14 4
Total	265	12	1231	56	308	14	412	18

Table 3 Family history of obesity

Relation	BMI GRADES (N= 2216)							
	Underweight		Normal weight		Overweight		Obese	
	No	%	No	%	No	%	No	%
Father Mother Siblings Grand parents No history	8 12 11 17 217	- 1 1 1 10	41 173 39 64 914	2 8 2 3 41	39 87 27 18 137	2 4 1 1 6	49 67 13 9 274	3 3 1 1 12
Total	265	12	1231	56	308	14	412	18

Table 4 BMI of the subjects

BMI GRADES	Underweight	Normal weight	Overweight	Obesity
Number	265	1231	308	412
Percent	12	56	14	18
Total	12	56	14	18

Table 5 BMI of children with different food habits

Types of diet	BMI GRADES (N= 2216)							
	Underweight		Normal weight		Overweight		Obese	
	No	%	No	%	No	%	No	%
Vegetarian	61	3	112	5	39	2	58	3
Non vegetarian	157	7	814	37	242	11	282	13
Ova vegetarian	47	2	305	14	27	1	70	3
Total	265	12	1231	56	308	14	412	18

Table 6 Feeding practices during infancy

Feeding practices	BMI GRADES (N= 2216)							
	Underweight		Normal weight		Overweight		Obese	
	No	%	No	%	No	%	No	%
Breast fed	213	10	1171	53	241	11	294	13
Not breast fed	52	2	60	3	67	3	118	5
Total	265	12	1231	56	308	14	412	18

Table 7 Parents awareness about nutritional aspects (N=567)

Scores	< 10	%	10 to 20	%	20 to 25	%
Before education	219	39	267	47	81	14
After education	112	20	136	24	319	56