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Original Research Article

Dietary Pattern of Obese Children in Erode District of Tamil Nadu

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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 conducted in the selected schools of Erode district to elicit the dietary pattern of obese children. A total of 500 children both male and female in the age group of 5 to 10 years from each district were selected for the study. Height and weight for all the selected children were taken and Body Mass Index was calculated. The calculated Body Mass Index of each child was compared with the standard percentile chart for children (Centre for Disease Control, 2000) so as to infer the nutritional status of children and identify the obese subjects. Children falling in the above 95th percentile category were selected by purposive sampling and the well framed questionnaire were given to them to elicit details on demographic profile, life style and food consumption pattern. The results of the study exposed the fact that most of the obese children were from affluent families indicating high socio economic status. The results revealed that the percentage of overweight and obese children are growing in Tamil Nadu 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. 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: *Obesity, Body Mass Index, 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. [(1)] Obesity is defined as an excess of body fat as measured by Body Mass Index (BMI) ratio in adults – this is calculated by dividing weight in kilograms by height in meters squared. In adults, a BMI over 25 is classified as overweight and over 30 as obese (classes I, II or III or moderate, severe or morbidly obese). According to Swaminathan 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. [(2)] 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.[(3)] 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. [(4)]

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.[(5)] Tamil Nadu has made significant strides in improving the health status and increasing access to health care services in the last decades. Considering the threats of overweight and obesity in this cyber era, the present study is carried out in selected schools of Erode educational district among children between the age group of 5 to 10 years to see the extent of overweight, obesity and underweight among the children of Kerala.

OBJECTIVES

- Study the socio economic status of selected school children,
- Assess the dietary pattern 0f obese children in the selected district,
- Find out the impact of nutrition education to the parents of obese children.

METHODOLOGY

Selection of Area:

Considering the good response, ease of communication and familiarity of the area the researcher selected private schools in Erode district of Tamil Nadu.

Selection of Sample:

A total of 500 children both male and female in the age group of 5to 10 years were selected for the study. Of these 209 were boys and 291 were girls. Since the age group selected for the study ranged from 5 to 10years, all the students studying from 1^{th} standard to 5^{th} standard were selected for the study.

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 paediatric 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 cut-offs to define obesity in adults are not appropriate for children. National BMI reference data are now available and are widely used and recommended.

$>95^{th}$ percentiles : obesity

Conduct of Study:

In order to fulfil the objectives of the study a questionnaire and an interview schedule was formulated to elicit the background information of the children. Anthropometric measurements were taken to identify the BMI and the status of body fat. The calculated BMI of each child was compared with the standard percentile chart for children (Centre for Disease Control, 2000) so as to infer the nutritional status of children and identify the obese subjects. Children falling in the above 95^{th} percentile category were selected by purposive sampling and the well framed questionnaire was given to them. Purposive sampling is confined to specific types of people who can provide the desired information, either because they are the only ones who have it (or) conform to some criteria set by the researcher. 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 questionnaire was formulated which embraces the details on demographic data which included address, religion, contact phone number, e-mail, area of residence, type of family, education qualification, occupation of the parents, monthly income, size of the family, number of children and birth order of the child. The selected children's parents were explained the need and importance of the present study and were requested to fill in the questionnaire.

Preparation of an interview schedule:

Details regarding the diet and lifestyle pattern of the selected subjects were elicited using an interview schedule. Data collected on lifestyle pattern include physical activity pattern, type and duration of screen time, snacking habits during screen time, frequency of dining habits, duration of sleep and family history of obesity. The dietary pattern elicited included

breakfast habits, details on skipping breakfast, fleshy food consumption, frequency of dining out, milk, fruits and vegetable consumption, commonly preferred outside foods, drinks and ready to eat foods.

Designing pamphlet, booklet and power point to impart nutrition education:

A pamphlet, booklet and power point presentation was prepared on obesity. It focused on strategies like causes and complications of obesity, ideal body weight of children recommended, physical activities, balanced diet, healthy lifestyle pattern and behaviour modification. Lectures were given for mothers on various aspects like need and importance of breast feeding, how to avoid complications during pregnancy, neo natal care, infant nutrition, need for physical activities in this cyber era, causes and complications of childhood obesity.

RESULTS AND DISCUSSION

Food habit of the subject: Food is any substance consumed to provide nutritional support for the body. Table I describes the food habits of the obese subjects in Erode.

Table I: Food habit of the subject

Food Habit					
Vegetarian		Non Vegetarian		Ova vegetarian	
No:	%	No:	%	No:	%
36	7	448	90	-	-

It was noted that in Erode 90 percent were non vegetarians and the rest seven percent were vegetarians. None of the selected subjects in this district were ova vegetarians.

Frequency of non vegetarian consumption: Obesity and high cholesterol levels were found to be greater among non vegetarians. The frequency of consuming non vegetarian food stuff by the subjects were elicited and is presented in table II

Table II: Frequency of non vegetarian consumption

Frequency							
Daily		Weekly Once		Weekly Twice		Rarely	
No:	%	No:	%	No:	%	No:	%
96	21	73	16	279	63	-	-

It was observed that in 21 percent of the obese subjects consumed non vegetarian foods daily and sixteen percent consumed the same weekly once. Sixth three percent had non vegetarian food stuffs twice a week. Eating at fast food restaurants is very common among young people with 75 percent of 7^{th} to 12^{th} grade students consuming fast food in a given week.[6]

Form of fleshy food preferred: Cooking is the process of preparing food by the use of heat. In deep fat frying food is submerged in hot oil or fat. Shallow frying is the cooking of food in small quantity of fat. Boiling is the method of cooking food in water, stock or milk. The details regarding the form of fleshy food preferred by the obese subjects is given in Table III

Table III: Form of fleshy food preferred

Forms					
Deep Fried		Shallow Fried		Boiled	
No:	%	No:	%	No:	%
326	73	106	24	16	3

It was clear that 73 percent of the subjects preferred deep fried foods and 24 percent preferred shallow fat fried food stuffs. Only three percent preferred fleshy foods in the boiled or curry form.

Favorite non vegetarian food stuff: Children had varying preference for fish, chicken, meat and egg. Some of the children preferred all the above listed food stuff. The favourite non vegetarian food stuff of the subjects were elicited and is presented in Table IV

Table IV: Favourite non vegetarian food stuff

Food Stuff									
Chicken		Fish		Meat		Egg		All the above	
No:	%	No:	%	No:	%	No:	%	No:	%
23	5	23	5	37	8	-	-	376	79

It was obvious that 79 percent of the subjects all the non vegetarian food stuffs like chicken, fish, meat and egg. Eight percent of the subjects had greater preference for meat (mainly red meat). Five percent preferred chicken and none preferred egg the most. Only five percent preferred fish the most.

Similarity in the diet preferences of the subjects and parents: Parents food choice had a positive effect on the subject's preference. Similarity in the diet preference of the subjects with the parents were studied and is presented in Table V

Table V: Similarity in the diet preferences of the subjects and parents

Diet Preference			
Similar		Dissimilar	
No:	%	No:	%
409	82	91	18

It was noted that 82 percent had diet preference similar to the parents and 18 percent did not show any similarity in the preference for diet with the parents. Family members' model eating and activity behaviour for each other provides social support for weight control effects. [(7)]

Mood and food choice: Emotions are the complex psycho physiological experience of an individual state of mind as interacting with internal and external influences. The details on mood and food choice were studied and is presented in Table VI

Table VI: Mood and food choice

Moods			
Do Affect		Do not affect	
No:	%	No:	%
402	80	98	20

Eighty percent of the selected obese subjects agreed that moods affect the food choice. They have a tendency to eat more when they are happy or sad. Stress influences a child's eating habits. Feeling of depression can cause child to overeat. [(8)]

Preference for fruit and vegetable: The health benefits of a diet rich in fruits and vegetables is well established. The preference for subjects fruits and vegetables were studied and is presented in Table VII

Table VII: Preference for fruit and vegetable

Preference			
Do prefer		Do not prefer	
No:	%	No:	%
156	31	344	69

It was observed that sixty nine percent of the subjects did not prefer to have fruits and vegetables in the diet. Compared to adolescents who ate three or fewer meals per week, those who ate four to five family meals were nineteen percent less likely to report poor consumption of vegetables, 22 percent less likely to report poor consumption of fruits and 19 percent less likely to report poor consumption of dairy products.[(9)]

Frequency of Milk consumption: Milk contains significant amount of saturated fat, protein, calcium and Vitamin C. It is referred to as a complete food. The frequency of consumption by the subject is depicted in table VII

Table VII: Frequency of Milk consumption

Frequency per day					
Once		Twice		Thrice	
No:	%	No:	%	No:	%
129	26	102	20	269	54

It was noted that 54 percent of the subjects had milk three times a day and 20 percent had twice a day. The trend of substituting sweetened drink for milk has been found to lead to excess weight gain. [(10)]

Favorite outside food stuff: Children had varying preference for outside food. Spiced food in the gravy or curry form was less preferred by the children while dining out. Noodles, pizza, all chat items and all fast foods were on the top category of preference. The details regarding the favorite outside food stuff is presented in table XI

Table XI: Favourite outside food stuff

Food stuff									
KFC*		Noodles		Pizza		Chat items		All fast foods	
No:	%	No:	%	No:	%	No:	%	No:	%
-	-	79	16	116	23	209	42	96	19

*Kentucky Fried Chicken

The order of preference for outside food stuff was none for Kentucky Fried Chicken (KFC) 16 percent for noodles, 23 percent for pizza, 42 percent for chat items and 19 percent for fast foods.

Frequency of consuming commercial foods and drinks: Some parents had the habit of storing carbonated beverages in fridge which promotes its consumption by the child. The details on the frequency of consuming commercial foods and drinks were elicited and is presented in table X

Table X: Frequency of consuming commercial foods and drinks

Frequency									
Daily		Weekly once		Weekly twice		Rarely		Never	
No:	%	No:	%	No:	%	No:	%	No:	%
17	3	366	73	41	8	76	16	-	-

It was noted that three percent of the subjects consumed commercial foods and drinks daily, 73 percent had weekly once, 8 percent had weekly twice and 16 percent consumed the same rarely. It was shocking to note that none of the subjects were categorized under the 'never' which denotes the frequency.

SUMMARY AND CONCLUSION

The study entitled "Dietary pattern of obese children in Erode District of Tamil Nadu" was conducted at schools of Erode district, to identify the prevalence of obesity in selected schools and to explore the association of obesity with dietary pattern. Children falling in the above 95th percentile category were selected by purposive sampling and the well framed questionnaire was given to them. 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 obese children is on rise in Tamil Nadu, like in other states of India and globally. The study also showed that the socio economic factors like income of the family, family system, residential area and birth order of the child are positively associated with the prevalence of childhood obesity. In short the study showed that life style pattern like family history, minimum physical activity, long duration of screen

time, snacking during screen time, dining outside very frequently and sleep pattern of the child do contribute to childhood obesity. Dietary habits like frequent consumption of deep fat fried fleshy foods; fast food consumption and soft drinks consumption play a vital role in increasing the number of obese children. 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.

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