

ORIGINAL ARTICLE**ASSESSMENT OF EATING HABITS AND NUTRITIONAL KNOWLEDGE AMONG INDIAN CHILDREN: A RANDOMIZED TRIAL**

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ABSTRACT:

Background: Obesity is one of the common problems occurring in the adolescent and characterized by abnormal and excessive fat accumulation in adipose tissue to the extent that health may be adversely affected. In both developing and developed countries, the prevalence of obesity is increasing at an alarming rate. It has become a serious epidemic health problem, estimated to be the fifth leading cause of mortality at global level. Hence; we evaluated the association between obesity, eating habits and nutritional knowledge among children in Indian population. **Materials & Methods:** The present study included all the children of 8 to 10 years of age studying in government schools in Luchnow. A total of 600 children were evaluated from September 2014 to August 2015. Measurement of anthropometric measures (weight and height) was done by calculating BMI when verifying current nutritional status. Must et al criteria were used as standard for our study BMI over the 85th percentile in children were considered overweight and those with BMI over the 95th percentile were considered obese. Logistic regression methods were used to assess the level of significance. **Results:** Female population was predominant in the present study. More than 80% of the population had parents whose education level was limited to less than primary education. The prevalence of overweight was approximately 15% and of obesity was less than 10%. Only variable found to be significantly ($p < 0.05$) associated to obesity was the eating habits. An increased risk of obesity was seen in younger age although it was not significant ($p = 0.12$). No direct correlation was seen among knowledge that children had concerning nutrition and obesity. **Conclusion:** Children possess very little information about the nutritional and healthy dietary habits which further reflects insufficiency of the knowledge sources which could impart better knowledge to them about all these factors.

Key words: Children, Obesity

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INTRODUCTION

One of the common problems occurring in the adolescent and adults these days is obesity which is characterized by abnormal and excessive fat accumulation in adipose tissue to the extent that health may be adversely affected.¹ In both developing and developed countries, the prevalence of obesity is increasing at an alarming rate. It has become a serious epidemic health problem, estimated to be the fifth leading

cause of mortality at global level.² Moreover; for many diseases such as certain cancers, hypertension, type II diabetes mellitus, dyslipidemia, metabolic syndrome and coronary heart disease, it is a risk factor.³⁻⁶ Potential causes of obesity includes changes in dietary habits and physical activity. Previous research has shown that weight depends on energy balance defined as the relation between energy intake and energy expenditure.⁷⁻⁹ Hence, we evaluated the association

between obesity, eating habits and nutritional knowledge among children in Indian population.

MATERIALS & METHODS

The present study included all the children of 8 to 10 years of age studying in government schools in Lucknow. A total of 600 children were evaluated from September 2014 to August 2015. Measurement of anthropometric measures (weight and height) was done by calculating BMI when verifying current nutritional status. Must et al criteria were used as standard for our study.¹⁰ BMI over the 85th percentile in children were considered overweight and those with BMI over the 95th percentile were considered obese. All the teachers and the guardians were pre-informed about the study protocol and written consent was obtained. Jelliffe et al criteria were used for collecting and measuring the anthropometric data.¹¹ Height and weight measurement of the children was done using standard measuring weight machine and height measuring scale. By utilizing a standardized self-administered questionnaire, information on eating habits and knowledge concerning nutrition were obtained. Perry et al and Stevens et al' criteria were used to frame the questionnaire for the students.^{12, 13} The more frequent the habit of eating breakfast, consuming milk, fruits and greens and the less frequent the habit of consuming soft drinks and snacks, the higher the eating practice scores would be and the better the eating habits (results could vary from 6 to 23 points). 12 illustrated questions on knowledge concerning foods were used to measure the level of knowledge in nutrition. Aside from the alternative, "I don't know" answers were used to reply to these questions. Each question answered correctly was equivalent to one point.

Wrong answers and "I don't know" did not receive scores. The scores varied from zero to 12. Parents' total number of years of schooling was a variable collected by means of a questionnaire sent to the child's mother or guardian. The variables residential zone and age were gathered from each child's school records. All the results were analyzed by SPSS software. For scores of higher than the median (>12), eating habits were considered healthier and when scores were lower than or equal to this value (≤ 12), eating habits were considered less healthy. The variable level of nutritional knowledge was categorized in "is more knowledgeable" when the score was equal to or above 8 correct replies and "less knowledgeable" when the score was below the 8 correct replies. Logistic regression methods were used to assess the level of significance.

RESULTS

The characteristics of the population are summarized in Table 1. A predominance of female population was observed in the present study. More than 80% of the population had parents whose education level was limited to less than primary education. The prevalence of overweight was approximately 15% and of obesity was less than 10%.

The results of the simple logistic regression of the associations between obesity and selected variables are shown in Table 2. Only variable found to be significantly ($p < 0.05$) associated to obesity was the eating habits. An increased risk of obesity was seen in younger age although it was not significant ($p = 0.12$). No direct correlation was seen among knowledge that children had concerning nutrition and obesity.

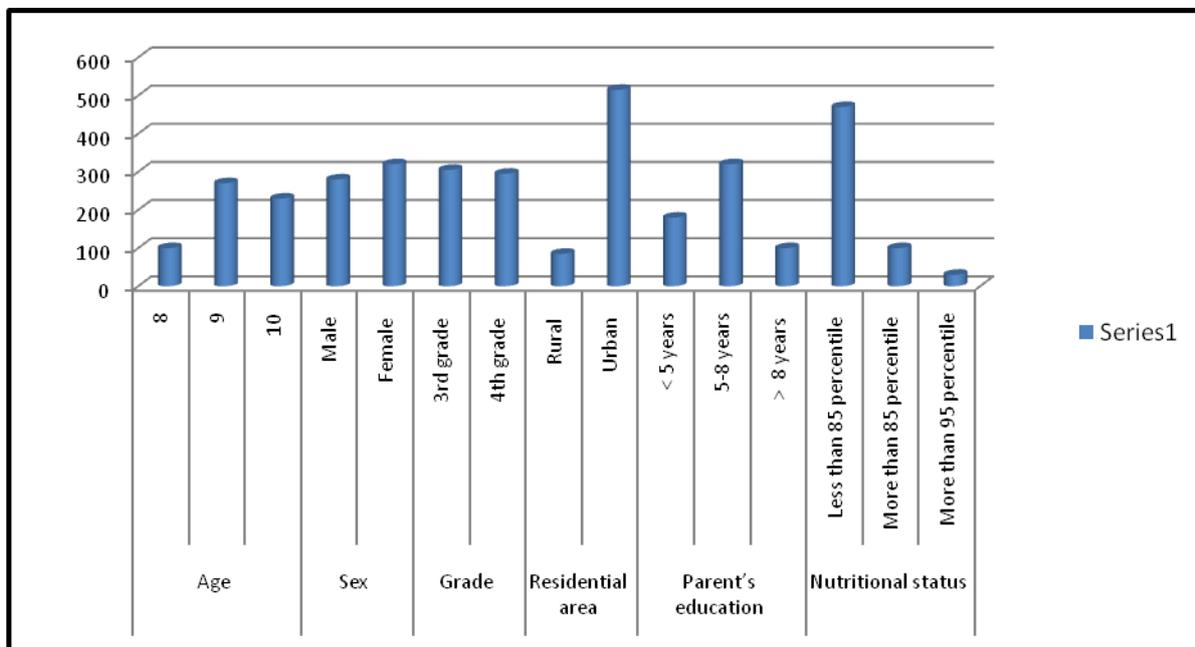
Table 1: Demographic details of the school children (N = 600)

Characteristic		Number
Age	8	100
	9	270
	10	230
Sex	Male	280
	Female	320
Grade	3 rd grade	305
	4 th grade	295
Residential area	Rural	85
	Urban	515
Parent's education	< 5 years	180
	5-8 years	320
	> 8 years	100
Nutritional status	Less than 85 percentile	470
	More than 85 percentile	100
	More than 95 percentile	30

Table 2: Simple logistic regression between variables and results

Characteristic		Obese (60)	Non-obese (540)	p-value
Age	8	15	220	0.12
	9	25	200	
	10	20	120	
Sex	Male	25	220	0.252
	Female	35	320	
Knowledge in nutrition	More	25	400	0.158
	Less	35	140	
Residential area	Rural	45	420	0.185
	Urban	15	120	
Parent's education	<5 years	20	160	0.845
	5-8 years	30	290	
	> 8 years	10	90	
Habits of eating	Healthier	20	310	0.002
	Less healthy	40	230	

Graph 1: Demographic details subjects.



DISCUSSION

From the past two decades, the prevalence of obesity has increased substantially.^{14, 15} An increase in prevalence of overweight and obesity within a short period of time have been reported by National surveys in the United States. Since 1991, 19.8 percent of US adults are obese, defined as having a body mass index (weight (kg)/height (m)²) equal to or greater than 30 kg/m², which percentage reflects a 61 percent increase as shown by most recent data derived from the Behavioral Risk Factor Surveillance System.¹⁶ Obesity, in turn, is a precursor to several major health problems, including, but not limited to, diabetes mellitus, coronary heart disease, and sleep-breathing disorders.¹⁷

Composition and quality of diet also defines the quality of food intake which has been associated with obesity apart from volume of food ingested but also in terms of the composition and quality of diet. Furthermore, eating habits have also changed and current habits include low consumption of fruits, green vegetables, and milk; increasing consumption of snacks, sweets, and soft drinks; and skipping breakfast; these eating habits result in continuous increase in adiposity among children.¹⁸ Apart from environmental differentials, eating habits show the most dominant determinant in increasing the tendency of overweight and obesity among children.¹⁹ Hence; in Indian population, we evaluated the association between obesity, eating habits and nutritional knowledge among children.

Specific practices associated to obesity, which could possibly signify a mistaken attempt to reduce calorie intake were not having breakfast in the morning and low frequency of milk consumption. Niklas et al argue that the intake of high energy snacks is minimized by regular consumption of breakfast which may control body weight by decreasing consumption of fats in the diet.¹⁹

The present research indicates that the level of knowledge in nutrition is greater among obese children which is in contrast to previous studies which show that children and adolescents have not shown the relation between knowledge of nutrition and obesity. Due to their condition, they possibly are more interested and/or more likely to receive information on this subject. However, this greater knowledge in nutrition had no effect on their BMI. An increase in knowledge and in improvements in some attitudes and eating habits was seen in previous studies which utilized nutritional education in schools as one of their strategies.^{20, 21}

When the level of nutritional knowledge of school children was taken into consideration, eating habits were found to be strongly associated with obesity. This reflected the limitation of the study that children are asked to fill out, including the questionnaire utilized in this study. Garcia-Contiente et al analyzed the eating habits, sedentary behaviors and overweight and obesity among adolescents in Barcelona. They conducted a cross-sectional study in 2008 on a representative sample of secondary school students in Barcelona (Spain). They concluded that being on a diet and a lower unhealthy food intake were related to obesity in both sexes. Among boys, obesity was also associated with sedentary behaviors.²² Abo Zead et al evaluated the eating habits and obesity among Jordanian University students. They cross-sectional surveyed 642 students, aged 21.25 ± 1.85 years randomly from the Jordanians University Campus during the fall 2007 semester and evaluated them through a questionnaire that included questions on their eating habits. From the results, they concluded that although there was overall low prevalence of overweight and obesity patients in the studied sample, most of them were smokers.²³

CONCLUSION

From the above results, it can be concluded that children possess very little information about the nutritional and healthy dietary habits which further reflects insufficiency of the knowledge sources which could impart better knowledge to them about all these factors.

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