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Original research article

To determine the prevalence of over-nutrition among the rural school children of age group 10-12 years in south Kerala: A cross-sectional study

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Abstract

Introduction: Obesity among children is an emerging health problem in our country and is a risk factor for adult onset non-communicable diseases that are preventable. WHO defines obesity or overweight as a condition of abnormal or excessive fat accumulation that may impair the quality of health and standard of living.

Objective: To determine the prevalence of obesity and overweight among rural school children of age group 10-12 years at Karakonam, Trivandrum district in South Kerala from June to July 2023.

Methods: Cross-sectional study.

Sample size: 161.

Study Population: 10-12 years.

Location: Rural School, Karakonam, Trivandrum district of South Kerala.

Assessment: Semi-structured validated Questionnaire using WHO STEP wise Instrument with anthropometry and risk factors for obesity.

Results: The prevalence of overweight and obesity from the 161 sample was 22.4% and 28.6% respectively. This study showed a significant association between lack of physical exercise and screen time with obesity (p=0.044). The study also revealed that 54% had excess screen time, 67% had fast food consumption and 80% had a history of watching television during meal times.

Conclusion: This study shows the belief that overweight or obesity as the problem of developed countries and affluent urban population is no longer true. Excess Screen time, inadequate physical activities and faulty food practices are one of the many contributors to over-nutrition.

Keywords: Obesity, overnutrition, risk factors for obesity, IAP BMI charts

Introduction

The prevalence of childhood obesity has increased recently all across the world. The current predictions show that by 2030, 1 in 8 of all children and adolescents (aged 5 to 19) will be obese [1]. By 2030, more than 27 million children (representing one in 10 children worldwide), are expected to be obese in India, according to UNICEF's world obesity atlas for 2022. The "double burden" is a particular issue that affects developing nations like India. At one end of the spectrum, there is childhood and teenage obesity, and at the other, there is an undernourishment and underweight child. Children who are overweight or obese are more likely to remain overweight into adulthood and are more prone to have early onset of non-communicable diseases including diabetes and cardiovascular disorders. Therefore, it is very important to focus on childhood obesity prevention.

The rise in sedentary lifestyles, unhealthy eating patterns, poor diets, lack of physical activity, and excessive use of technology are all factors contributing to the obesity and overweight epidemic in adolescents. Evidence suggests that exposure to screen media causes obesity through increased snacking while watching, exposure to high-calorie, low-nutrient food and beverage advertising that shapes kid's preferences, requests for purchases, and consumption patterns. Decreased sleep time and lack of awareness are also factors causing obesity in children and adolescents [2].

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Childhood obesity is a complex medical issue at present, representing an interplay between various physical and environmental factors. This heterogeneous nature of obesity in children makes its treatment challenging. This points out to the need for precision of obesity treatment in children. The purpose of the study is to determine the prevalence of overweight and obesity among 10-12 year old rural school going children and to find the associated modifiable risk factors.

Objectives

1. To determine the Prevalence of overweight and obesity among the rural school children of age group of 10-12 years.
2. To assess the possible modifiable risk factors and Relationship of physical activities and screen time with obesity.

Materials and Methods

Study design: Cross Sectional Study.
Sample size: 161 [3].
Study population: 10-12 years of Rural School children.
Study period: June-July 2023.

Inclusion criteria

1. Children in the age group 10-12 years in the study period.

Exclusion criteria

1. Not willing to participate.
2. History related to chronic illness.

Procedure

After obtaining the consent of both Institutional Ethical committee and the local school management through proper channel the study was conducted during the break time with the parents/guardian's consent in written local language. Data was collected using a semi structured validated questionnaire which took 15minutes. This preformed questionnaire, was filled by their parents, and was handed out to children 3 days prior to the data collection, from the school. The date of birth of the participant was recorded and age was measured in completed months. The anthropometric data such as height and weight measurements were recorded. Weight of the participant was measured with light clothing and without shoes using electronic weighing machine [ESSAE Accurate trade links] which was calibrated daily against standard weight and recorded to the nearest 0.1kg. The weighing machine was calibrated to zero prior to each measurement. Height was measured without shoes using a portable standardized stadiometer [SECA portable stadiometer height-rod] and recorded to the nearest 0.1cm. BMI was calculated and plotted in 2015 IAP BMI charts [4] and compared.
Modifiable risk factors for obesity were elicited using a semi-structured questionnaire with questions included from WHO STEP wise instrument [5]. Screen time was calculated in hours spent on gadgets and considered significant or not based on IAP guidelines [6]. Physical activity is considered adequate if there was one hour of structured physical activity (playtime).

Data analysis

Data collected was entered into the worksheet using MS Excel and analysis was done using SPSS trial version software. Prevalence of obesity and overweight among the study population, concurrent relationships and independent risk factors were calculated. Both were expressed as frequencies and percentage values. All Qualitative variables were assessed using Chi-Square test.

Results

Out of the 161 children, 51%, 49% were boys and girls respectively. The Mean BMI recorded as 18.3(±4.8). The Prevalence of overweight and obesity were 22.4% and 28.6% were identified (Refer Table 1). The study showed a significant association between lack of physical exercise and screen time with obesity (p=0.044). 54.3% had excess screen time, 67.4% fast food consumption and 80.4% had history of watching television during meal times (Refer Table 2).

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Table 1: Showing distribution and Assessment of parameters in the study sample

Parameters		Values (%)/SD	
Sex			
Male		82(51%)	
Female		79(49%)	
Weight (kg)		37(±11.84)	
Height (cm)		141.5(±8.43)	
BMI (kg/m^2)		18.3(±4.8)	
Categories of Classification of Nutrition (%)			
Normal		63(39%)	
Overweight		36(22%)	
Obesity		46(29%)	
Underweight		16(10%)	
Modifiable Risk Factors in Obesity (N=46)			
Screen time		**TV while eating**	
≥2 hrs.	25(54%)	Yes	37(80%)
1-2 hrs.	17(37%)	No	9(20%)
≤1 hr.	4(9%)		
Physical Activities		**Family History**	
≥2 hrs.	2(4%)	Present	7(15%)
1-2 hrs.	32(70%)	Absent	39(85%)
≤1 hr.	12(26%)		
Fast Food		**Sleep Quality**	
Yes	31(67%)	Adequate	41(89%)
No	15(33%)	Inadequate	5(11%)

Table 2: Showing association of Physical activities and screen time with Obesity (n=46)

Screen Time	Physical Activity						Chi-Square Value	P-value
	≤1 hr.		1-2 hrs.		≥2 hrs.			
	Count	Percent (%)	Count	Percent (%)	Count	Percent (%)		
≤1 hr.	2	16.7	1	3.1	1	50	9.324	0.044
1-2 hrs.	2	16.7	15	46.9	0	0		
≥2 hrs.	8	66.7	16	50	1	50		
Total	12	100	32	100	2	100		

Discussion

In our study we found that there was a significant percentage of children belong to overweight (22.4%) and obese (28.6%) category among the study population. There was a positive relationship between inadequate physical activity and excess screen time with obesity (p-0.044). Santha Kumar *et al.* [7] found that among 139 children studied (age group 11-13 years), 57.5% had normal BMI, 25.2% were overweight, 6.5% were obese and10.8% were underweight. The same study showed majority of their subjects (52.5%) had an average screen time of >2hours and physical activity was found to decrease with increasing screen time, and this was found to be statistically significant. The reason for higher prevalence of obesity was due to the greater number of obesity children identified in this area.

Conclusion

This study shows that overweight or obesity can also affect the lower and backward classes in addition to the affluent urban population. Excess Screen time, inadequate physical activities and faulty food practices are one of the many contributors for overnutrition. A holistic approach to tackle the childhood obesity epidemic is the need of the hour. School physical education may be supported and the availability of physical activity options may be increased.

Limitations

1) Possible risk factors which were feasible were selected.
2) The sample doesn't reflect the entire population.

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Conflict of interest: None Declared.

Ethical approval: The study was approved by IEC.

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