

## ORIGINAL RESEARCH

# Dietary Pattern And Their Effect On Physical Health Status Among School Going Children In Central India

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### ABSTRACT

**Background:** An adequate diet and physical activity is a prerequisite for appropriate growth and development. Balanced nutrition coupled with physical activity forms a healthy lifestyle which eventually leads to multiple health benefits such as positive health and a lower risk of non communicable diseases.

**AIM:** The objective of this study to determine dietary pattern and their effects on physical health among school going children in central India.

**Methods:** This cross-sectional observational study was carried out in the department of paediatrics in a tertiary care hospital, central India. 350 school going children whose parents or guardian provide consent for the study were enrolled. The socio-demographic data, anthropometric measurements for physical health status and dietary pattern was recorded. The data collected was analysed using the statistical analysis SPSS version 22.

**Results:** The mean age of the participants was 12.4±2.2 years. Female participants were slightly more (54.9%) than male. Majority of them (56.9%) was vegetarians. 61.4% of taking meal 2 times in a day and 66.3% has eats junk food sometimes in a week. Prevalence of overweight or obesity was 4.6% and 29.7% had short stature. Mean body mass index was 16.48±3.64, mean waist circumference was 23.23±4.35 whereas mean hip circumference was 27.56±4.35.

**Conclusion:** More emphasis should be given to limiting junk food intake, increasing healthy food intake, and motivating the students to be more physically active. This can be done by encouraging the family as well as teachers at the school level and creating more spaces for children to be physically active at the community level

**Keywords:** School going children, Diet, Junk Food, Physical Activity

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### INTRODUCTION

An adequate diet is essential from the very early stages of life for appropriate growth and development so as to remain active. Balanced nutrition coupled with physical activity eventually leads to multiple health benefits such as healthy lifestyle, positive mental health and a lower risk of non communicable diseases like obesity, dyslipidemia, diabetes, hypertension, etc [1-2]. The dietary habits of adolescents are important factors to understand their present and future health. High consumption of nutrient-poor dietary items and inadequate consumption of protein and vitamin-rich diet can contribute to various health problems like malnourishment, metabolic disorders and obesity [3-4]. Adolescence has a special importance for long-

term health because it is a critical period of development, in which the physical, psychological, behavioural, social and economic foundations of adult health are consolidated. Adolescence is a key time for acquiring muscle and bone mass, and peak and cardio-respiratory fitness, which are nutritionally sensitive, are achieved. Adiposity, which is also influenced by nutrition, is related to later health. Wide spread brain re-modeling during adolescence leads to a large increase incognitiveability [5-6].The World Health Organization (WHO) estimates around 340 million children and adolescent to be overweight in 2016 with half of the under-five years burden of overweight and obesity being attributed to Asia [7]. With increasing urbanization, the problem of overweight, especially in the rural areas and among

adolescents presents a steep challenge in healthcare. With the adoption of “life-cycle approach” the behavioral aspect of adolescent health has gained importance. Dietary factors and physical activity being the cardinal modifiable factors, measurement of their effects on development of overweight and obesity has become even more necessary [8-10]. Junk foods are very popular among children these days. They are loaded with trans-fats, sugar and high calorie with low nutrients and adversely affect children’s physical strength [11]. Rapidly changing dietary habits and increasing academic load predisposes the students to adopt unhealthy food practices which can lead to multitude of health problems like non-communicable illnesses associated with obesity, including insulin resistance diabetes, neuro degeneration, and psychological changes, as well as stroke, headaches and migraine precipitation, the metabolic syndrome, adult onset diabetes, non-insulin-dependent diabetes, coronary artery diseases, polycystic ovarian syndrome, non-alcoholic fatty liver disease, cancers, autoimmune diseases, and site specific neoplasm in both children and adults [12].

#### AIMS & OBJECTIVE

The aim of this study to determine dietary pattern and their effects on physical health among school going children in central India.

#### MATERIALS AND METHODS

This cross sectional observational study conducted in the department of paediatrics in the S.S. Medical College, Rewa, India. Subjects are school going children randomly selected from various higher secondary schools were enrolled in this study. Written inform consent was taken from the parents or guardian and school authorities. The survey was done

in predesigned questionnaires and completed in the presence of teachers and researchers on the school premises. All students age 10 to 19 Years with both gender and those who were willing to participate in the study and whose parents gave consent were included. All students age less than 10 or more than 19 years of age, with known psychiatric diseases, chronic kidney diseases, Heart and Tubercular disease and those whose parents not gave consent were excluded from the study. All the students asked to fill the data including their socio-demographic, dietary habit and anthropometry data were noted. The levels of consumption of junk foods and sweets and their effect on physical health was measured. Junk foods, according to the Indian Council of Medical Research (ICMR), contain little/no protein, vitamins or minerals but are rich in salt, sugar, fats and high in calories. Eg: chocolates, cold drinks, chips, ice creams, French fries etc

#### STATISTICAL ANALYSIS

Data was analysed by using SPSS software version 22. The association between children’s junk food intake and physical activity was investigated using the Chi-square test. The threshold for statistical significance (p) was established at 0.05.

#### RESULTS

In the present study, out of total 350 study participants, female were predominant (54.9%) than (45.1%) male. The mean age of the study participants was 12.76 years. Most of the study participants, i.e., 178(50.9%) were from government school. 56.9% was vegetarian diet; majority of them (61.4%) consumed meal 2 times in a day and 66.3% of consumed junk food sometimes in a week. Details shown in table: 1.

**Table 1: Socio-demographic and dietary variables of study participants**

Socio-demographic variables		Number	Percentage
Mean age (In Years)		12.763±2.2	
Gender	Male	158	45.1%
	Female	192	54.9%
School	Government	178	50.9%
	Private	157	44.9%
	Central School	15	4.3%
Diet	Veg	199	56.9%
	Non Veg	151	43.1%
Meal/Day	2 times/day	215	61.4%
	3 times/day	122	34.9%
	>3 times/day	13	3.7%
Junk Food consumed /Week	Sometimes	232	66.3%
	Never	70	20%
	Most of the times	48	13.7%

Most of the participant eats in sitting (63.7%), 29.4% taking meal during watching TV.

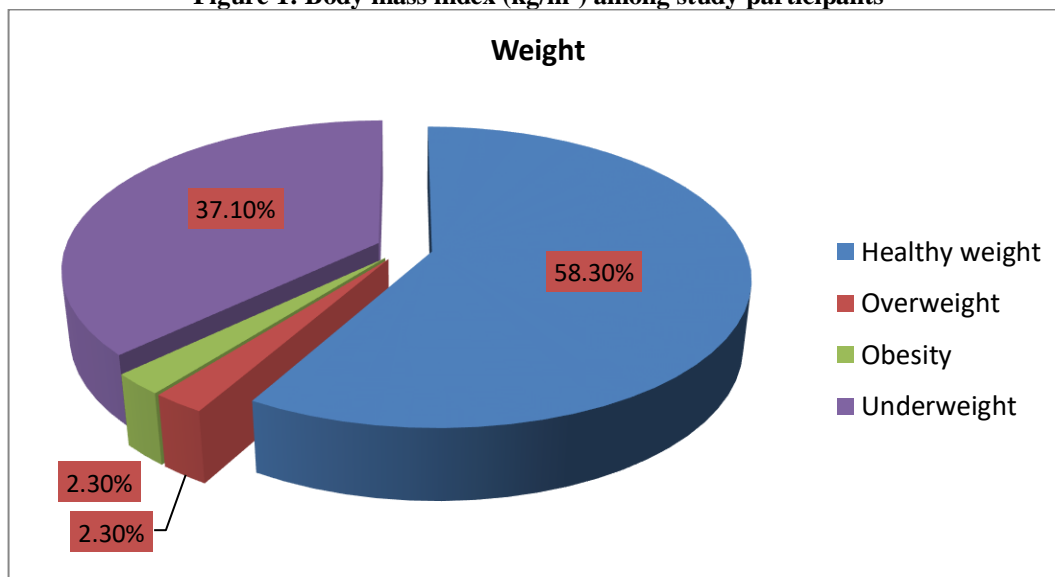
**Table 2: Distribution of participants on the basis of physical activity done while eating**

Activity done while eating	Frequency	Percentage
Sitting	223	63.7

Watching TV	103	29.4%
Standing	20	5.7%
Walking	3	0.9%
Reading	1	0.3%

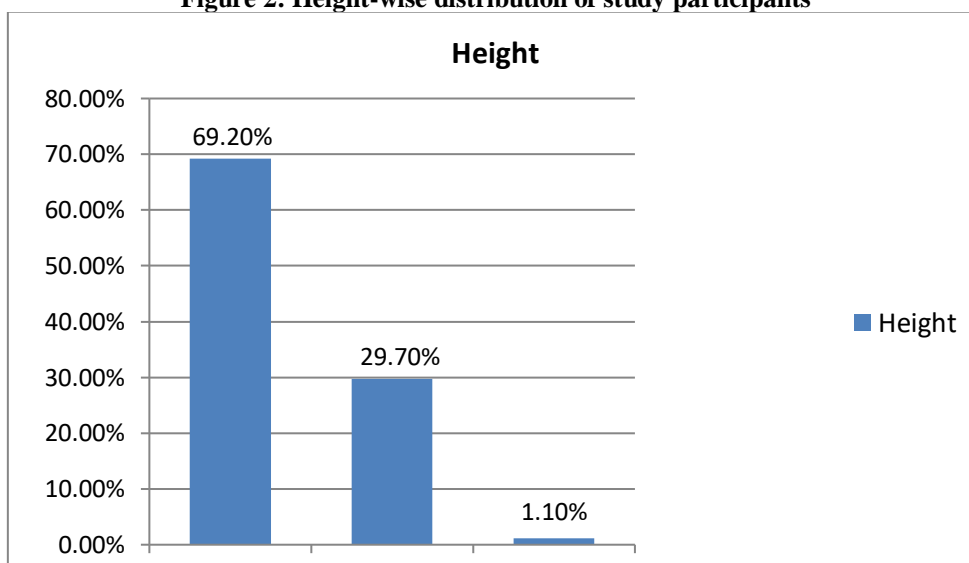
Majority of the school children have normal weight (58.3%) and 37.1% had underweight.

**Figure 1: Body mass index (kg/m<sup>2</sup>) among study participants**



69.2% had a normal stature, 29.7% have short stature and 1.1% has tall stature.

**Figure 2: Height-wise distribution of study participants**



Mean value of RBS was found to be 99.23±22.52 mg/dl, Mean value of weight was 34.68±11.03 kg, mean height was 1.34 ±0.47 meter, mean value of waist: hip ratio was 0.85±0.12. Details of blood sugar, BMI, waist and hip circumference shown in table: 3.

**Table 3: Mean of random blood sugar, weight, height, BMI, waist: hip ratio**

Variables	Mean	Standard deviation	95% Confidence Level Of Mean	
			Lower	Upper
Random Blood Sugar (mg/dl)	99.23	22.52	96.92	101.57
Weight (Kg)	34.68	11.02	33.60	35.86
Height (Meter)	1.33	0.47	1.28	1.38
BMI	16.48	3.64	16.13	16.87
Waist circumference (Inch)	23.33	4.35	22.90	23.81
Hip circumference (Inch)	27.56	4.35	27.15	28.02

Waist /Hip Ratio	0.851	0.11	0.83	0.86
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## DISCUSSION

Energy intake was assessed by daily dietary consumption and energy expenditure in the form of physical activity. In energy intake, the intervention comprised education about adherence to a low energy density diet, greater intake of fruits, vegetables, and whole grains, and decreased sugar consumption helped study participants in weight loss. In addition, portion control, taking regular breakfast, increased daily water intake, and studying food labels for calorie content while shopping for groceries facilitated weight loss and energy expenditure was related to education about increased physical activity like regular walking, jogging, and aerobic exercises such as swimming, cycling, etc. for an average of 75 minutes [13-14]. In our study the mean age of the participants were  $12.76 \pm 2.2$  years, concordance finding reported by ME Barker, et al [15]. Proportion of females was slightly higher than males observed in current study, in agreement with the Kumar et al [16] and Hollar D, et al [17]. In the current study, there were only 2.6% students who fell under the obese/overweight category, similar to study conducted by Maumita Kanjilal et al [18] reported prevalence of overweight/obese were 3% whereas the prevalence of overweight was 5.9% and obesity was 2.7% in a study conducted by Ahmad S, et al [19]. In the present study majority of the students consumed two main meals a day. It is observed that adolescent girls had tendency to take less meal in a day as compared to boys, this may be due to adolescent girl desire to be thin and the unhappy feeling about their weight [20-21]. The present study shows that height and body weight increases along with the advancing of age in both boys and girls. In present study 20.7% of children have short stature, correlate with the Junaid Khan, et al [22]. The present study shows high occurrence of underweight, which is more or less the same in both sexes. The frequency of over weight is low compared to that of underweight. One possible reason for the high occurrence of underweight could be traced to poverty, low dietary intake, excessive energy outflows due to hard labour, and chronic infections [23]. The majority of study participants reported eating breakfast on a regular basis, with some exceptions, and breakfast items consumed were a combination of western and Indian foods. These findings align with other studies reporting that Indian adolescents ate a combination of traditional and junk food meals, with those of higher SES having a greater preference for western-style foods and fast food meals [24-25]. In present study vegetarian diet was not significant associated with the weight and height of the children, our finding was comparable with the L Desbouys et al [26].

In our study majority of the students consumed junk food sometimes in a day. A study illustrated that 30.8% of students had consumed junk foods on their

way home and 24.1% at home.[27] A study in Brazil also found that food environment in school is one of the major causes of consumption of unhealthy food among teenagers.[28] A study found that 22.0% of students reported consuming junk food 5–6 times per week while the majority (44.7%) reported consuming junk food sometimes (2–3 times per week).[29] In another study, students consumed junk food twice a day (42.3%), once a day (40.1%) and 4–6 times within last two days (13.4%) [30] Whereas in a similar study done by Joseph et al., students consumed junk food almost every day. One-third of adolescents consume fast foods three or more times during a week [31]. With respect to relation between junk food intake and physical activity among students, a previously conducted study reported a significant association between daily recommended intake of food groups and physical activity levels.

## CONCLUSION

We have concluded that the poor choice of dietary habits significantly affects the physical development among school-going adolescents therefore the healthy dietary practices and physical activity should be promoted to mitigate the risk of obesity. Increasing awareness among the girls regarding the ill-effects of junk foods and soft drink is also needed.

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