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A Comparative Study of Nutritional Health Mapping of Private and Government School Going Children Under 6-12 year

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ABSTRACT

Purpose: School is an important period for growth and development. Children's activities, diet, and nutrition all have an influence on their physical and cognitive development throughout this period. The present study will examine the nutritional condition of government and private school students aged 6 to 12 based on their eating patterns.

Methods: A comparative cross-sectional study was done in both government and private school children, 100 students between the ages of 6 and 12 were interviewed about their eating habits, and they were asked to fill out a proforma as well as anthropometric measurement were taken. The data was analysed using appropriate statistical method.

Result: Result of the study found that the prevalence of underweight is higher in government school pupils i.e. 40%, however in private school there is a 4% incidence of overweight is found and no incidence of overweight is detected in government school. Intake of more calories, salt, saturated fats, and sugar on a daily basis than students in public schools, raising their risk of sickness.

Conclusion: Students attending government schools are more likely to suffer from undernutrition, while those attending private schools tend to be overweight and consume more unhealthy foods. In order to encourage healthy growth and avoid future health hazards, this emphasizes the necessity of customized dietary interventions in both school contexts.

Keywords: *Nutritional status, overweight, dietary intake, school children.*

1. INTRODUCTION

School-age children are especially important since this is the time when the body stores nutrients. These reserves aid in the fast development of youngsters. During this age range, people can address the dietary inadequacies and prevent growth, development, and cognitive achievement impairments. Mental and physical development also continues. (Gulati & Hochdorn, 2014) A person's immunity is lowered by inadequate nutrition, while their susceptibility to a wide range of diseases, harm to their physical and mental development, and decreased productivity are all caused by inadequate nutrition. (Sasikala, 2016) Good diet leads to a stronger immune system, less sickness, greater health, and a more productive society. The quality and amount of food consumed by children often alter as they progress from childhood to adolescence. (Singh & Sharma, 2021)

The nutritional status can be measured in a number of ways. One of the best methods for determining a child or adolescent's nutritional status is anthropometry. Height-for-age (stunting), weight-for-height (wasting), weight-for-age (underweight), and thinness (body mass index [BMI] for age) are anthropometric measures that are frequently used to evaluate nutritional health during childhood stages. (Hrishikesh Kumar1, 2019)

The net enrolment rate at the primary level is 88.6% (90.0 percent for girls and 87.3 percent for boys), according to the most recent data available from 2023 on education-related indicators. At the secondary level, it falls to 34.3% (33.5 percent for boys and 35.0 percent for girls). At the primary level, the adjusted net enrolment ratio was 99.1%, while at the secondary level, it was 64.7%. According to the 2021 National Achievement Survey, 34% of students in grades 3, 5, and 8 met the desired performance levels in every subject, up from 48% in 2017. (Country Office Annual Report 2023)

Since students spend more than six hours a day in school, school lunches play a significant role in determining their general nutritional status. (Bhargava, Kandpal, Aggarwal, & Sati, 2014) To combat the problem of malnutrition and its consequences in India, the mid-day meal scheme for school-aged children was launched in 1995, under which one-third of daily calorie and half of daily protein requirements of primary school-aged children were met by providing cooked mid-day meals in schools. However, the major goal of this strategy was to boost school enrolment and attendance. (Verma, Sharma, Khanna, Srivastava, & Sahoo, 2020) Due to its ability to increase female school attendance, MDMP can help close the gender gap in education. (Kusuma, 2014)

Every child requires a nutritious or balanced diet in order to grow and develop properly. Junk food has grown popular in today's society. The kids despise homemade nutritious meals. Junk food is harmful to one's health. According to one study, physical and social environment factors have a considerable impact on children's eating habits. (Sultana & Ahluwalia, 2016) The health issues that students face differ from nation to nation. The most common health issues are intestinal parasites, infectious infections, skin, eye, ear, and dental cavities, as well as malnutrition. The school years lay the groundwork for mental and physical well-being. (Prithviraj Karak, 2017) The main causes of illnesses include the use of polluted or hazardous water, inadequate sanitation, and unsanitary hygiene practices. Infection transmission between people is typically favored by inadequate sanitation practices and a lack of personal hygiene. (Meher & Nimonkar, 2018) Numerous studies have concluded that the poor nutritional value, excessive salt content, and high levels of saturated fats and trans fats associated with fast food products likely contribute to the prevalence of hypercholesterolemia, hypertension, type II diabetes, obesity, and cardiovascular disease in Westernised societies. (I, p, MM, N, & MZ, 2019) A favourable parental role model may be a more effective means of influencing a child's nutrition than dietary regulation. (Brown & Ogden, 2004)

Private school students have superior nutritional status than public school youngsters. This might be attributed to the higher socioeconomic position of private school students. The nutritional evaluation based on Body Mass Index reveals that the prevalence of healthy children is higher in private schools, at 89.16%, and lower in government schools, at 15.83%. Undernutrition is more prevalent in public schools than in private schools. (M, 2019)

Food habits formed in childhood continue into adulthood and serve as the foundation for either good or bad health in the future years. As a result, there is a need to educate parents, particularly those in the middle and upper socioeconomic classes, on proper food practises for their children in order for them to have healthy and productive lives as adults. (Mukherjee & Chaturvedi, 2017)

Participating in physical activity and limiting sedentary behaviour is central to a child's health, development and psychosocial wellbeing. Higher level of physical activity is associated with low mortality rates for both adults and children. (Mahaur & Badiger, 2018) Regular activity supports brain development, bone strength, muscle control, balance and coordination, and helps to achieve and maintain a healthy weight. How ever the theories assume that higher physical activity leads to improved cognitive and academic performance, reversible connections are feasible, with high levels of cognition and academic achievement leading to more physical activity. (Pherson, Mackay, Kunkel, & Duncan, 2018)

2. AIMS AND OBJECTIVES

1) To study about nutritional status of school going children.

2) To determine the food habit of school going children.

3. METHODOLOGY

Study design: A comparative cross-sectional study carried out in schools.

Study location: Varanasi's private and government schools. The schools were selected using a purposive sampling process. One private school and one public institution were selected for each stratum.

Unit of study: The study involved students from 6 to 12 years from randomly selected schools. The total number of students in private schools and government schools from 6 to 12 years that met the inclusion criterion was 100. The entire number of students in government schools from classes 2 to 4 was around 50 and same in private school. A semi-structured questionnaire was used to elicit the desired information about socio-epidemiological variables of children such as age, gender, type of diet, frequency of junk food consumption, physical activities, outdoor games and duration of watching TV. A pilot study with 20 school children was conducted to test the validity of the questionnaire. The purpose of the research was explained to the students, and a questionnaire was provided in the classroom. Students were informed about the research's objectives, and a questionnaire was provided in the classroom. One-on-one discussions with children were carried out to

validate the information, and the children's height and weight were measured using standardized methodologies utilizing a stadiometer and a portable dial weighing machine. The establishment of an international growth standard for monitoring school-aged children is motivated by two recent events: the global surge in childhood obesity and WHO's announcement of new international development standards for pre-school children. All children were examined physically, and their height in centimetres and weight in kilogrammes were recorded. Each child's height and weight were measured in the metric system using standardised methodologies.

Inclusion Criteria – The following criteria were used to include participants in the study:

- Children were enrolled from both private and government schools within the age group of 6-12 years irrespective of caste, creed or religious background.
- Physically and mentally able to participate in anthropometric measurement and dietary assessments.
- Willingness of the child and parents to participate in assessment like questionnaire, anthropometric measurement.

Exclusion Criteria – The following participants were excluded from the study to ensure uniformity and eliminate confounding variables:

- Children under 6 or over 12 years of age.
- Chronic illnesses (e.g. Type 1 diabetes, epilepsy, tuberculosis, asthma under medication)
- Congenital or genetic disorder (e.g. Down syndrome, Thalassemia)
- Physical or mental disabilities that effect eating, metabolism, or growth pattern.
- Recent acute illnesses (e.g. fever, diarrhea, viral infection within past few weeks)
- Children currently receiving nutritional supplements.
- Biochemical parameters (haemoglobin< 10g/dL, serum creatinine, fasting blood glucose>110 mg/dL, vitamin D levels < 10 ng/mL severe deficiency)
- Children with known food allergies or intolerances that impact their daily diet.
- Absenteeism > 25% or incomplete background information.

4. DATA ANALYSIS

Using SPSS version 2.0, the data was verified for completeness, coded, input, and analysed. The data were analysed using descriptive statistics, which included percentage, frequency, and central tendency measurements.

5. RESULT

Age	Government School		Private School		Total	
6-7 years	10	20%	5	10%	15	15%
8-9 years	12	24%	22	44%	34	34%
10-11 years	19	38%	19	38%	38	38%
12 years	9	18%	4	8%	13	13%
Total	50	100%	50	100%	100	100%

Table 1: Classification of age in school

Table 1 shows the classification of age in government and private school in which 6-7 years children are 20% in government school and 10 % in private school, 8-9 years are 24% in government school and 44 % in private school, 10-11 years are 38% in government school and private school both and 12 years students are 18% in government school and 8% in private school.

	Government School		Private School		Total	
Normal	30	60%	31	62%	61	61%
Underweight	20	40%	17	34%	37	37%
Overweight	0	0%	2	4%	2	2%

Total	50	100%	50	100%	100 100%

Table 2: BMI of children studying in Government vs Private schools

Table 2 illustrates the BMI of students studying in government and private school. The number of underweight children are higher in government school i.e. 40% in comparison to private school which is 34% and 4% overweight case is found in private school whereas no child is overweight in government school.

Meals	Government School		Private School		Total	
2 times	23	46%	12	24%	35	35%
3 times	24	48%	21	42 %	45	45%
4 times	3	6%	15	30%	18	18%
5 times	0	0%	2	4%	2	2%
Total	50	100%	50	100%	100	100%

Table 3: Number of meals in Government vs Private school

Table 3 shows the fixed meals of students in which it is found that greater number of students in government school have 2 and 3 times of fixed meal while in private school 2 to 3 times of fixed meal is higher i.e. 42% and 30% and also 4% of students take 5 times of fixed meal.

Fast Food	Government School		Private School		Total	
Yes	32	64%	44	88%	76	76%
No	18	36%	6	12%	24	24%
Total	50	100%	50	100%	100	100%

Table 4: Number of students consume fast food

Table 4 illustrate the consumption of fast food in government vs private school children in which it is found that private school children intake of fast food is higher i.e 88% in comparison of government school children which increases the risk of overweight and obesity in children.

Physical Activity	Government School		Private School		Total	
Yes	37	74%	30	60%	67	67%
No	13	26%	20	40%	33	33%
Total	50	100%	50	100%	100	100%

Table 5: Participation of students in physical activity

Table 5 illustrate the participation of students in physical activity in which it is found that 74% government school students actively participate in physical activities in comparison to private school children.

Food Classification	**Frequency**				**Total**
	Daily	**Weekly**	**Rarely**	**Never**	
Cereals	**50**	**0**	**0**	**0**	**50**
Pulses	**33**	**17**	**0**	**0**	**50**

Milk	**36**	**13**	**1**	**0**	**50**
Fruits	**22**	**26**	**2**	**0**	**50**
Green leafy Vegetables	**23**	**25**	**1**	**1**	**50**
Fats and Oils	**0**	**19**	**22**	**9**	**50**

Table 6 illustrate that all 50 students in government school consume cereals everyday, 33 students consume pulses daily and 17 students consume weekly. 36 students consume milk daily and 13 students consume milk weekly also 1 student consume milk rarely. Fruits and green leafy vegetables are consumed daily and weekly by most of the students. No students are found to consume fats and oils daily whereas 19 students consume fats and oils weekly and 22 students consume it weekly.

Food Classification	**Frequency**				**Total**
	Daily	**Weekly**	**Rarely**	**Never**	
Cereals	**50**	**0**	**0**	**0**	**50**
Pulses	**45**	**5**	**0**	**0**	**50**
Milk	**39**	**10**	**0**	**1**	**50**
Fruits	**17**	**30**	**2**	**1**	**50**
Green leafy Vegetables	**9**	**35**	**3**	**3**	**50**
Fats and Oils	**11**	**28**	**11**	**0**	**50**

Table 7 illustrate that all 50 students in private school consume cereals everyday, 45 students consume pulses daily and 5 students consume weekly. 39 students consume milk daily and 10 students consume milk weekly also 1 student never take milk. Fruits and green leafy vegetables are consumed daily and weekly by most of the students, student never take fruits and 3 students never consume green leafy vegetable. 11 students are found to consume fats and oils daily whereas 28 students consume fats and oils weekly and 11 students consume it weekly

6. DISCUSSION

Poor socioeconomic conditions are the primary source of the majority of nutritional issues that are seen in our nation. (L, Jose, & Kappen, 2018) A cross-sectional study of 100 children aged 6 to 12 years from a government and private school in Varanasi, Uttar Pradesh, found that children from the government school were substantially more underweight than children from the private school. This study's conclusions included the following: To begin with, there was a significant rate of underweight among government school students. On the contrary, a substantial number of students attending private schools were overweight. (Sharma, Muzammil, & Singh, 2018)

This might be attributed to mothers' literacy, economic status, child age, and the number of meals they consume. People who ate two meals a day were more likely to be underweight. Snacks and junk foods consumed both outside and at home are key risk factors for overweight and obesity, and participation in physical activities may also play a role, as the study found that private school children do not actively participate in physical activities.

The cause of poor health outcomes in children is inadequate nutrition. (Lourdumary & Devi, 2016) Snacks and fast-food meals both at home and away from home are significant risk factors for overweight and obesity. Snacks and junk meals include more fat and energy. The incidence of overweight/obesity in children increased as the frequency of consumption of high-calorie meals increased. Several studies have revealed a positive association between high calorie/fat diets and body weight. The frequency of undernutrition in our study was unrelated to junk food. (Ashok, Kavitha, & Kulkarni, 2014)

The eating frequency pattern illustrates the development of children. According to this data, cereal consumption is equal in both public and private schools. Cereals are an excellent source of carbs. Pulses are ingested less frequently in public schools than in private schools, where they are consumed weekly according to the mid-day meal menu. They were found to be reliant on the mid-day Meal for school lunch, and the practise of skipping meals was shown to be prevalent among the researched group of 6-12 year old in government schools. (Kumar & Khanna, 2021). Protein is required for muscle growth and repair, as well as for energy in growing youngsters. It was also shown that milk intake was lower in government school children than in private school children, which is important to meet children's calcium requirements, aids in bone growth, and reduces the risk of fracture and osteoporosis. Fruits and vegetables are abundant in vitamins, which are required for good physiological health and functioning. According to this study, private school children eat fewer fruits and vegetables and prefer fast food, whether from outside (momos, pizza, burgers, etc.) or from home (maggie, pasta, sandwiches, etc.), which raises the risk of cardiovascular disease, digestive problems, vision problems, and depression.

The negative effects of obesity on one's health might range from a higher chance of dying young to a decline in one's quality of life. (Dr Chaitanya Gujjarlapudi, 2017) According to this study, students at private schools consume more calories, salt, saturated fats, and sugar on a daily basis than students in public schools, raising their risk of sickness. This would not be a problem if they only ate fast food on occasion, but eating fast food on a daily basis might be detrimental to their health. During this age range, people can address their dietary inadequacies and prevent growth, development, and cognitive achievement impairments. Mental and physical development also continues. (A.Khan, Das, Zareen, & Lassi, 2022) A high sugar, salt, saturated fat, and calorie diet causes obesity, hypertension, dyslipidemia, and decreased glucose tolerance. Many types of periodontal disease may be linked to nutritional deficiencies, such as those in calcium, vitamin D, ascorbic acid, and protein, or they may cause oral symptoms that resemble those of periodontal disease. (Madhusudhan & Madhusudhan, 2019) Snacks and fast food consumed outside the home are a key risk factor for being overweight or obese.

7. CONCLUSION

According to this study, underweight children are more widespread in government schools, whereas obesity is more prevalent in private school children due to sedentary lifestyles and a lack of engagement in physical activities. Private school children consume more calories, salt, saturated fat, and sugar on a daily basis in comparison to public school children. This needs the development of significant methods to promote a healthy lifestyle among schoolchildren, such as raising knowledge about a balanced diet and the appropriate amount of physical exercise. To prevent undernutrition, government schools should prioritize improving midday meals with nutrient-dense foods, encouraging nutrition instruction, and doing routine health screenings. To reduce obesity, policy in private schools must prioritize limiting junk food, promoting physical exercise, and educating students about healthy eating and lifestyle choices. Cross-cutting strategies, such as community cooperation, parental involvement, and integration with school health programs, are essential for long-term effects and to guarantee the general nutritional well-being of children aged 6 to 12.

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