



Nutritional Status of School Children in an Urban Area of Odisha- A Comparative Study in Govt. vs. Private School

Authors

Krishna Kar¹, Sasmita Pradhan², Barada Prasanna Samal³

¹Professor, Department of Community Medicine, PRM Medical College, Baripada, Odisha, India

²Senior resident, Dept. of Community Medicine & Family Medicine, AIIMS, Bhubaneswar, Odisha, India

³Assistant Professor, Department of Orthopedics, Govt. Medical College, Balasore, Odisha, India

Corresponding Author

Dr Sasmita Pradhan

Dept. of Community Medicine & Family Medicine, AIIMS, Bhubaneswar, Odisha, India

Phone no-8018666777, Email: saisasmitapradhan@gmail.com

Abstract

Background: *Healthy childhood is the basis for healthy and productive adult life. School is the place where apart from formal education; children also learn behavioral, lifestyle and moral values. Nutritional status of the child is one of the key factors determining the enrollment, performance and continuation in school.*

Objective: *To assess the nutritional status of school children.*

Material and Methods: *The present cross sectional study was carried out in selected schools (both govt. and Private) of urban field practice area of SCB Medical College, Cuttack, Odisha during January 2016 to December 2016. A total of 660 school going children were taken for the study. After taking informed consent of the head of the school data was collected by using a Pre-designed, pre-tested questionnaire. The anthropometric measurements such as weight, height were measured for nutritional status.*

Results: *In the present study 45.9% children were underweight. Both male and female students of private school were significantly taller than their counterparts of govt. school except for 5th class male students. The mean weight of private school students (for both the class and sex wise) was significantly more than that of in govt. school.*

Conclusion: *In the present study the nutritional status of the govt. school children was poor as compared to private school children.*

Keywords: *Nutritional status, children, govt. vs. private school, urban area, anthropometric measurement.*

Introduction

Every child, on provision of a suitable environment, may blossom into an ever fragrant flower, to shine in all spheres of life. This reminds us the responsibility that we have to mould and shape their present conditions in the best possible way. The statement "Children are the future of the nation" will have no meaning without proper

education to them as education being considered as the fourth necessity for man after food, clothing and shelter, in today's competitive world^[1]. To attain effective learning children should have good health.

The World Health Organization's Expert Committee on School Health Services noted as long back as 1950 that "to learn effectively,

children need good health". Nutritional deficiencies and poor health in primary school age children are among the causes of low school enrolment, high absenteeism, early dropout and poor classroom performance^[2]. The School health services in India dates back to 1909, when for the first time medical examination of school children was carried out in Baroda city. Though so many years have elapsed since independence, status of health of school children has not improved a lot. In spite of so many initiatives, these school children have not received as much attention from health providers and planners as compared to infants and under fives through various National health programmes [e g: ICDS, RCH programme]^[2-5].

The present study was carried out with the objective to assess the nutritional status of govt. school vs. private school children in the urban field practice area of SCB Medical College and Hospital.

Materials & Methods

Study Design- A cross-sectional study.

Study Period- January 2016- December 2016

Study Population- Children reading in the schools, situated in the urban field practice area of the department of Community Medicine of SCB Medical College, Cuttack

Calculation of sample size

$$\text{Sample size}(S) = 4pq/L^2$$

$$q = 100 - p, L = \text{Allowable error}$$

$p = 41\%$ (prevalence of underweight in schoolchildren to be 41% according to a study conducted by JP Singh et al.)^[5]

$$L = 10\% \text{ of prevalence i.e. } 10\% \text{ of } 41 = 4.1$$

$$\text{Sample size}(S) = 576$$

After adding a non-response error of 15%, an additional 87 children were included. Thus a total of 660 (nearest round figure of 663) school children were selected for this study.

Sampling technique: Multistage sampling technique was used to select the schools, classes and sections as follows i.e.

- Simple random sampling- to identify the schools, the classes in each school and subsequently the sections in the selected classes
- Systematic random sampling- to identify children in the particular section

Steps of activity

Selection of schools- At the outset a written permission for conducting the research work was taken from the District Education Officer, Cuttack and a complete list of all govt. and private schools located in Cuttack city was obtained from the office. Out of total 19 schools located in urban field practice area, 16 were govt. schools and rest 3 were private schools. 50% of the total schools i.e. 10 schools (8 govt. schools and 2 private schools) were selected by simple random sampling method.

- **Selection of classes-** Out of 10 classes, 2 (20%) classes i.e. one each from primary and high school was selected randomly. So, 5th and 9th class was selected for the study. It was decided to have equal number of students i.e. 330 (50% of 660) students from each class.

➤ Selection of sections and study subjects-

After reaching the individual school, the number of sections in the required class was enquired. From each class sections were chosen by simple random sampling method. The registers of the selected sections were collected from the school office and from the register, the students were chosen by systematic random sampling method till the required sample size is reached. If anybody from the selected roll number was absent then the next roll number was taken into account for the study. Among the schools that were selected, in 2 schools both 5th & 9th class were present. By this procedure 47 (330/7=47) students from class 5th of each selected seven schools and 66 (330/5=66) students from class 9th of each selected five high school were taken for the present study

After preparation of questionnaire, pretesting was done in one English medium and one Odia

medium school, then necessary correction in the questionnaire was done. Students were interviewed through oral questionnaire method.

Tools for data collection-

The children were surveyed through pre-designed and pre-tested questionnaire. The questionnaire was designed according to the study objectives.

- **Anthropometric measurements-** it Included measurement of height and weight of individual study subject. Height was measured by making the child to stand on a firm leveled surface and against a flat surface such as a wall, without wearing any footwear, and stand with feet flat, together and against the wall, legs were straight, arms at sides and shoulders at level. The child looked straight ahead and that the line of sight was parallel with the floor. The measurement was taken while the child stood with head, shoulders, buttocks and heels touched the wall. Then a flat headpiece was placed right angle with the wall and lowered until it touched the crown of the head and it was marked where the bottom of the headpiece met the wall. Height was measured with the help of a measuring tape to the nearest 0.1 centimeter from the base on the floor to the marked measurement on the wall. The weight was measured by a mechanical weighing machine with shoes removed. The recordings were made to their nearest 0.1 kg measurements. The machine

was validated every time before use by placing known weights over it. After calculating the BMI, the nutritional status of each child was plotted in the growth chart of children 2-20 years as per CDC, where age was on X-axis and BMI on Y-axis.

- **BMI percentiles according to The Centre for Disease Control (CDC) 2000 growth chart for age 2-20 years^[6] was adopted for calculation of nutritional status which is mentioned below-**

BMI for age Percentile range	Weight status category
< 5 th percentile	Underweight
5 th to less than 85 th percentile	Normal
85 th to less than 95 th percentile	Overweight
≥ 95 th percentile	Obese

Prior permission and ethical clearance for the study was obtained from the Institutional ethical committee of S.C.B Medical College. During the process of the data collection, the teachers were given feedback about the nutritional status of the children. Those requiring follow up care were advised to consult doctor at urban health and training centre (UHTC).

Data Analysis

Data thus collected were entered and analysed by using the software SPSS 21 version in the Department of Community Medicine, S.C.B Medical College and appropriate statistical measures were applied in this study.

Results- A total of 660 school children were examined during the present study.

Table 1 Distribution of study subjects (male & female students) according to schools (n=660)

Name & type of school	Class to be selected for the study	Study subjects		Total
		Male	Female	
Saraswati sishu mandir, junuspatna (Private)	5 th and 9 th	38	76	114
Railway settlement UP school (Govt.)	5 th	22	25	47
Railway settlement high school (Govt.)	9 th	39	27	66
Dayasagar vidyamandir, canal road (Private)	5 th and 9 th	50	63	113
Jobra UP school (Govt.)	5 th	23	24	47
Jobra high school (Govt.)	9 th	34	32	66
Budhimangala UP school (Govt.)	5 th	21	26	47
Budhimangala high school (Govt.)	9 th	43	23	66
Pareswarsahi UP school (Govt.)	5 th	21	26	47
Muradkhan patna UP school (Govt.)	5 th	28	19	47
Total		319	341	660

Table 2 Sex wise distribution of study subjects in government and private schools (n=660)

Type of school	Male	Female	Total
Government schools	231(53)	205(47)	436(100)
Private schools	88(39.3)	136(60.7)	224(100)
Total	319(48.3)	341(51.7)	660(100)

* Numbers in parenthesis indicate percentage

Table 2- shows the distribution of study subjects in govt. vs. private schools. The number of govt. schools in the locality were more than that of private schools, out of total 660 study subjects 436(66.06%) were from govt. schools and rest 224 (33.94%) from private schools. Out of the 436

study subjects from govt. schools, 231(53%) were male students and 205(47%) were female students. Out of the 224 study subjects from private schools, 88(39.3%) were male students and rest 136(60.7%) were female students.

Table 3 Distribution of mean height (in meter) of children of govt. vs. private school (n= 660)

Class & Sex		Govt. school (mean height \pm SD) in meter	Private school (mean height \pm SD) in meter	t- test	p- value
5th	Male	1.38 \pm 0.06	1.39 \pm 0.08	0.72	P =0.472
	Female	1.31 \pm 0.03	1.36 \pm 0.08	4.87	P =0.0001
9th	Male	1.49 \pm 0.09	1.55 \pm 0.14	3.63	P =0.0001
	Female	1.45 \pm 0.11	1.50 \pm 0.11	2.91	P =0.004

Distribution of mean height (in meter) of children of govt. vs. private school is given in table-3. Both male and female students of private school were

significantly taller than their counterparts of govt. school except for 5th class male students.

Table 4 Distribution of mean weight (in kg) of children of govt. vs. private school (n= 660)

Class & Sex		Govt. school (mean weight \pm SD) in kg	Private school (mean weight \pm SD) in kg	t- test	p- value
5th	Male	31.27 \pm 4.38	40.74 \pm 12.59	6.95	P =0.0001
	Female	30.5 \pm 3.58	35.41 \pm 3.95	8.18	P =0.0001
9th	Male	40.33 \pm 7.27	52.16 \pm 11.45	7.97	P =0.0001
	Female	42.26 \pm 5.61	44.65 \pm 7.17	2.39	P =0.018

The table 4 shows the mean weight of male and female students of govt. vs. private school in class wise distribution. The mean weight of private

school students (for both the class and sex wise) was significantly more than that of in govt. school.

Table 5 Nutritional status** of study subjects according to BMI in govt. vs. private school (n= 660)

BMI category	Type of school		Total
	Govt.	Private	
Underweight (BMI < 5 th percentile)	264 (60.6)	39 (17.4)	303 (45.9)
Normal (BMI 5 th - 84 th percentile)	161 (36.9)	168 (75.0)	329 (49.8)
Overweight (BMI 85 TH -94 TH percentile)	8 (1.8)	12 (5.4)	20 (3.0)
Obese (BMI >95 TH percentile)	3 (0.7)	5 (2.2)	8 (1.2)
Total	436 (100)	224 (100)	660 (100)

* Numbers in parenthesis indicate percentage

** As per CDC 2000 growth chart for age 2-20 years

[Chi-square = 111.98, df = 3, p = 0.0001]

The distribution of children according to their nutritional status (BMI) is given in table-5. Out of

the 436 study subjects from Govt. school, 264 (60.6%) were underweight where as from 224

study subjects from private school, only 39 (17.4%) belonged to the same category. So it was observed that the proportion of under-nutrition was significantly (chi-square=110.8,df=1,p<0.05) more among the govt. school children than their counterparts from private school. 36.9% children from Govt. school had the BMI within the normal range whereas 75% children from private school had the BMI in the same range. Only 8(1.8%) and 3(0.7%) students from govt. school belonged to overweight and obese categories whereas the same from private school were 12(5.4%) and 5(2.2%) respectively. So the prevalence of obesity was also found to be less among govt. school children in comparison to private school children and it was statistically significant (chi-square=9.35,df=1,p<0.05).

Discussion

In the present study 45.9% children were underweight, which was higher than that reported in other studies carried out by Palash Das et al.^[7] (31.1%), Talukdar et al.^[8] (31.25%) and Aditya S Berad et al.^[9](31.66%).The higher prevalence of overweight/obesity in private school children may be due to sedentary behaviour and less physical activity. This finding in the present study was supported by the findings of D R Bharati et al, a study among school children of Wardha city, Central India. They found that the risk of overweight and obesity were significantly higher among children studying in private school than children studying in govt. school^[10].

Conclusion

In the present study ,significantly more proportion of underweight children were found in government school (60.6%) than that of private school (17.4%).Higher prevalence of overweight and obesity was observed among private school children (7.5%) in comparison to govt. In view of preventing obesity the children should be encouraged for regular exercise and outdoor games, they should also know the role of balanced diet for maintaining proper nutritional status.

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Conflicts of interest-None

References

1. Children in India 2012-AStatistical Appraisal,2013,Social Statistics Division, Central Statistics Office, New Delhi, Ministry of statistics and Programme Implementation Government of India
2. WHO Expert Committee on School Health Services. Report on the First Session. Geneva, World Health Organization, 1950 (WHO Technical Report Series, No. 30).
3. K Park. Park's Text Book of Preventive and Social Medicine. 22nd ed. Jabalpur (INDIA): M/s Banarsidas Bhanot; 2013.
4. P Panda, AI. Benzamin, Shavinder Singh, P. Zachariaiah. Health status of school children in Ludhiana city. Indian journal of community Medicine, Oct-Dec 2000: Vol 25 No.4: 150-55.
5. Singh JP, Kariwal P, Gupta SB, Singh AK, Imtiaz D. Nutritional status and morbidity among school going children: A scenario from a rural India. Scholars Journal of Applied Medical Sciences (SJAMS) 2014; 2(1D):379-383.
6. National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000) available at <http://www.cdc.gov/growthcharts>
7. Das Palash, Basu Mausumi, Dhar Gautam, Mallik Sarmila, Pal Ranabir. Nutritional status and morbidity pattern of government primary school children in north Kolkata of West Bengal, India. South East Asia Journal of Public Health 2012; 2(1): 13-17.
8. Talukdar K, Baruah R.Health Status of Primary School Children: A Community Based Cross Sectional Study in Rural Areas of Kamrup District, Assam. Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4,Issue 13, February 12; Page: 2093-2100, DOI: 10.14260/jemds/2015/301.

9. Aditya S Berad, B Chandra Sekhar Reddy, BP Ravi Kumar, Venu Bolisetti. Study of personal hygiene, nutritional and morbidity profile of school children in rural area of Khammam district, Andhra Pradesh. *Journal of Evolution of Medical and Dental Sciences* 2013; Vol2, Issue 34, August 26; Page: 6402-6405.
10. Bharati D R, Desmukh P R, Garg BS. Correlates of overweight and obesity among school going children of Wardha city, Central India. *Indian J Med Res* 127, June 2008: 539-543.