

Original article

Study on nutritional status, prevalence of vitamin deficiencies and morbidity pattern among school children in Mandal Parishad Primary School, Miyapur, Hyderabad

Annem Haritha* , Dr. Harikrishna

Mamata Academy of Medical Sciences, Hyderabad, Telangana

Corresponding author*



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Abstract

Background: Nutrition plays a key role in maintaining proper growth and development, to prevent disease, to protect from infections and to strengthen the immune system. Vitamin deficiencies are of great health concern because they have a potential effect on the physical growth, mental status and cognitive development of children. Hence it is important to know the nutritional status, pattern of morbidity and prevalence of vitamin deficiencies among school children.

Objectives:

- To study the nutritional status and morbidity pattern among school children in the age group of 9-12 years in a government school.
- To study the prevalence of vitamin deficiencies among school children in the age group of 9-12 years.
- To assess the number of students utilizing Mid-Day Meal services at school.

Methodology: Study was carried out in a government primary school in Miyapur, Hyderabad. A pre-tested questionnaire was used to assess the morbidity pattern, to clinically evaluate the presence of vitamin deficiencies and Body Mass Index was used to assess nutritional status. Stunting was estimated by utilizing reference values provided by WHO. A thorough clinical examination of the students was done. A total of 100 children in the age group of 9-12 years were studied. Chi-square test was used to analyze the statistical significance.

Observations: 60% of the students had a healthy BMI while 35% were underweight, 4% were at a risk of developing overweight, 1% were overweight. 34% of them were suffering from anemia out of which 21% of them were girls. 26% of the students were utilizing the Mid Day Meal Scheme at school. Clinically, 3% had Vitamin A deficiency, 5% had Vitamin D deficiency, 15% had Vitamin C deficiency. The other morbidities include, common cold 29%, dental caries 29%, refractive errors 8%, 11% of them had impacted wax, parasitic infestation 44%, 18% had worm infestation.

Conclusion: This study shows that a significant number of children were suffering from nutritional anemia and common illnesses. Emphasizing more on providing access to highly nutritious food, promoting utilization of school health services and food supplementary services, providing health education and promoting healthy and hygienic practices will improve the health status of the children thus enhancing their overall performance.

Introduction:

The age of 9 to 12 years is a crucial and dynamic period for physical and mental development of the child. Most of the children in this age group experience a growth spurt with increase in weight, muscle growth, genital maturation and they begin to enter puberty and are vulnerable to infections and malnutrition. Poor health during this age is one of the main reasons for early dropouts from school, high absenteeism, low school enrollment. These illnesses impair the gross performance and health of the child, which is carried forward to adulthood hence affecting the nation as a whole as they are the nation's future manpower. This can be prevented by promoting nutrition, providing health education, maintenance of personal hygiene and early diagnosis and treatment of diseases. Enhancing utilization of the school health services in order to gain maximum benefits to the children. Morbidity pattern is the prevalence and distribution of diseases, illnesses and health conditions within the specified population. Amongst school children, various factors which affect the morbidity pattern include socio economic status, personal hygiene, environmental factors and nutritional status. This study hence concentrates on analyzing the nutritional status, vitamin deficiencies and pattern of morbidity among school children to highlight the importance of nutrition in maintaining good health.

Aim:

To study the nutritional status, prevalence of vitamin deficiencies and morbidity pattern among school children of the age 9 to 12 years in Mandal Parishad Primary School, Miyapur.

Objectives:

- To assess the BMI of the children(9-12 years) to know the nutritional status.
- To clinically evaluate the prevalence of vitamin deficiencies among children.
- To study the morbidity pattern among the school children aged 9-12 years.
- To assess the number of students utilizing the Mid-Day Meal services in school.

Materials and methods:

Study Setting: Mandal parishad primary school in Miyapur

Study sample: 100 students

Sampling method: Convenient sampling

Study design: Cross-sectional study

Study Subjects: All students belonging to Grade 4 and 5 (from 9 to 12 years of age)

Inclusion criteria: Students of grades 4 and 5 who were present on the day of study.

Exclusion criteria: Students who were absent on the day of study.

Study instruments: Weighing machine, Stadiometer, pre tested questionnaire.

After taking permission and verbal consent from the Headmaster of the school, and clearly explaining the method and procedure of study to the subjects and taking consent from the subjects, preliminary particulars of the subjects including name, age and sex were recorded. Anthropometric measurements including Height and Weight were recorded. Weighing machine was used to measure the weight of the subjects in kilograms. Before the study, the weighing machine was standardized by using a known weight to check the accuracy at regular intervals. Zero

calibration was done periodically to eliminate errors. Subjects were asked to take off sandals and stand still on the weighing machine, looking forward. Weights of the subjects were recorded to the nearest 100 grams. Height was measured using a stadiometer. Height of students was recorded by asking the subjects to take off the sandals and stand against the wall with the head positioned straight, heels together and a stadiometer was used to record the height by coinciding with the top most point of head. The height was measured to the nearest 1 cm. General physical examinations of the children were carried out in a well lit and ventilated room with a source of natural light. A thorough clinical and family history was taken. The children and class teachers were given basic guidance and were referred to health centers if necessary.

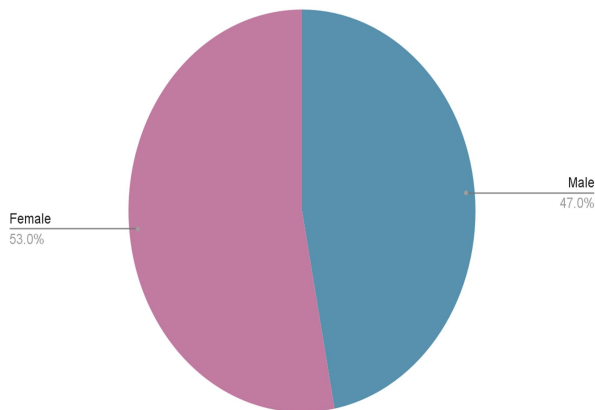
Results:

Stunting was estimated by utilizing the reference values provided by WHO. BMI was calculated and compared to the standard reference values to know the nutritional status. Pretested questionnaire was used to assess the morbidity pattern. A pre-tested questionnaire along with general physical examination was done to clinically evaluate the presence of vitamin deficiencies. Data collected was entered in Excel descriptive and inferential statistics were analyzed by using Epi-Info™ 7.2.4.0 Software and the Chi-square and p-value was calculated.

Table 1: Age wise distribution of the subjects (n=100)

Age (years)	Number of subjects (n=100)	Percentage(%)
9 years	15	15%
10 years	38	38%
11 years	25	25%
12 years	22	22%
Total	100	100%

Pie chart: Gender wise distribution of the subjects (n=100)



*Girls are 53% in number when compared to boys 47%.

Table 2 : Distribution of subjects based on weight (n=100)

Age (years)	Underweight	Risk of overweight	Overweight	Normal	Total (n=100)
9-10 years	20 (37.7%)	3 (5.6%)	0	30 (56.6%)	53
11-12 years	15 (31.9%)	1 (2.1%)	1 (2.1%)	30 (63.8%)	47
Total	35 (35%)	4 (4%)	1 (1%)	60 (60%)	100

$p=0.50, \chi^2=0.45$

*Table 2 showing 37.7% among 9-10 years and 31.9% among 11-12 years being underweight. There is no significant association between age and weight($p=0.50$).

Table 3 : Distribution of subjects based on height (n=100)

Gender	Stunting	Normal	Total (n=100)
Boys (n=47)	31(65.9%)	16(34.0%)	47 (47%)
Girls (n=53)	28(52.8%)	25(47.1%)	53 (53%)
Total	59 (59%)	41 (41%)	100 (100%)

$p=0.18, \chi^2=1.77$

*Table 3 showing 65.9% of boys and 52.8% girls are showing stunting and there is no significant association between gender and height. ($p=0.18$).

Table 4: Distribution of subjects based on prevalence of Vitamin deficiencies:

Vitamin deficiencies	Girls	Boys	Total(n=100)
Vitamin A	3	0	3%
Vitamin D	2	3	5%
Vitamin C	9	6	15%

Bar chart: Number of students utilizing Mid-Day Meal Scheme at school : Male-14, Female 12

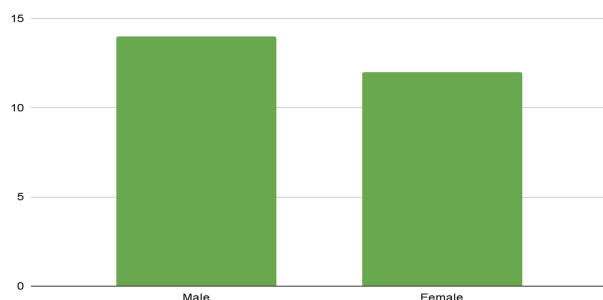


Table 5 : Distribution of subjects based on morbidity pattern:

Nutritional problems	Boys (n=47)	Girls (n=53)	Total (n=100)
Anemia	13(27.6%)	21 (40.3%)	34(34%)

*Table 5 shows girls suffered more from anemia (40.3%) compared to boys(27.6%).

Table 6: Prevalence of Respiratory Diseases

Respiratory Diseases	Boys	Girls	Total
Asthma	4 (8.5%)	7 (13.2%)	11 (11%)
Sinusitis	3 (6.3%)	4 (7.5%)	7 (7%)
Common cold	11 (23.4%)	18 (33.9%)	29 (29%)
Pharyngitis	2 (4.2%)	2 (3.7%)	4 (4%)

*Table 6 shows that 29% of students are suffering from the common cold.

Table 7: Prevalence of Oral Cavity Disorders

Oral cavity Disorder	Boys	Girls	Total
Dental caries	11 (23.4%)	18 (33.9%)	29 (29%)
Tonsillitis	2 (4.2%)	2 (3.7%)	4 (4%)

*Table 7 shows that 29% of the students had dental caries.

Table 8: Prevalence of Eye Diseases

Eye Diseases	Boys (n=47)	Girls (n=53)	Total (n=100)
Refractive errors	3 (6.3%)	5 (9.4%)	8 (8%)
Strabismus	2 (4.2%)	0	2 (2%)
Epiphora	2 (4.2%)	4 (7.5%)	6 (6%)
Conjunctivitis	5 (10.6%)	0	5 (5%)
Hordeolum	2 (4.2%)	3 (5.6%)	5 (5%)

Table 9: Prevalence of Ear Diseases

Ear Diseases	Boys (n=47)	Girls (n=53)	Total (n=100)
Impacted wax	4 (8.5%)	7 (13.2%)	11 (11%)
OME	2 (4.2%)	1 (1.8%)	3 (3%)
Otitis externa	0	3 (5.6%)	3 (3%)

Table 10: Prevalence of Skin Diseases

Skin Diseases	Boys (n=47)	Girls (n=53)	Total (n=100)
Eczema	4 (8.5%)	6 (11.25)	10 (10%)

<i>Mouth ulcers</i>	9 (19.1%)	3 (5.6%)	12 (12%)
<i>Parasitic infestation (head lice)</i>	12 (25.5%)	32 (60.3%)	44 (44%)

*Table 10 shows 60.3% girls had parasitic infestation (head lice) compared to boys (25.5%).

Table 11: Prevalence of GIT Diseases

GIT Diseases	Boys (n=47)	Girls (n=53)	Total (n=100)
<i>Constipation</i>	2 (4.2%)	9 (16.9%)	11 (11%)
<i>Gastroenteritis</i>	2 (4.2%)	5 (9.4%)	7 (7%)
<i>Worm infestation</i>	7 (14.8%)	11 (20.7%) ³	18 (18%)

*Table 11 shows 18% of the students had worm infestation.

Discussion:

This study included a total of 100 students with almost equal distribution of gender. All students in the age group of 9 to 12 years belonging to grade 4 and grade 5 were examined. The present study aimed at analyzing the nutritional status, prevalence of vitamin deficiencies and morbidity pattern among these school children. Calculation of BMI of the students shows that 35% of the students were underweight, 4% of them had a risk of developing overweight and 1% were overweight while 60% of them fell under healthy weight for height. The study shows that there is a high prevalence of nutritional anemia among school children accounting for about 34 out of 100 students examined. Amongst them girls (40.3%) showed a higher prevalence of nutritional anemia compared to boys (27.6%). A study conducted in the coastal area of Puducherry showed that pallor was observed more commonly among girls and was statistically significant which is similar to the current study. 15% of the students showed presence of Vitamin C, 5% showed Vitamin D while 3% showed Vitamin A deficiency. A study conducted in Ankara, Turkey showed that 40% among 440 subjects showed vitamin D deficiency which is much higher than the current study. There is a pretty high incidence of common illnesses among the school children. 29% of the students were suffering from common cold which may indicate poor ventilation and crowded classrooms promoting close contact among children. A significant number i.e 44% of the students had parasitic infestation (head lice) which indicates poor personal hygiene and close physical contact among children. The occurrence of ear, eye and oral cavity diseases is also significant. 18% of students were suffering from worm infestation which may indicate a common source of contaminated water and food and poor handwashing practices. A study in northwestern Ethiopia showed 69.1% among 408 school children examined had intestinal helminthic infections which is much higher than the current study. 29% of the students had Dental caries. A study conducted in RHTC Patancheru, Hyderabad showed occurrence

of worm infestation 13%, Dental caries 12% which shows a much lower occurrence of these morbidities than the present study. The present study also shows that only 26% of the students were utilizing the Mid Day Meal Scheme provided by the school. 74% of the students preferred home food over school food. The reasons for very low utilization of meals provided at school are inconvenient timings of meals, students feeling disgraced to be called as beneficiaries of the service and students preferring to carry packed lunch from home.

Limitations:

- Only a small sample size (n=100) is considered in this study.
- Other factors influencing the study: health and wellness of a child is also affected by various external factors like socioeconomic status, housing standards and knowledge of parents.
- Selection bias: Only students belonging to grade 4 and grade 5 who were present on the day of study were considered.

Recommendations:

- Providing proper health and nutrition education, basic sanitation and hygiene to children. Children are curious learners and they do carry the information learnt in school to their parents and try to implement those at home.
- Promoting utilization of mid day meal services at school and providing a proper balanced diet to the children at convenient timings and working on eliminating the stigma about meals at school.
- Encourage the students to grow their own food by developing a school garden.
- Conducting regular health checkup camps and also evaluating the effect of interventions implemented. Training the school staff and teachers in providing basic health service to the children.

Conclusion:

This study shows significant prevalence of nutritional deficiency and occurrence of common illnesses among school children. Understanding and analyzing the morbidity pattern and nutritional status is essential to know the need for intervention, for providing preventive care and enhancing utilization of school-based health services. By providing adequate nutrition and knowledge regarding good health practices, physical and mental health of children can be improved, academic performance and quality of life can be enhanced.

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