

Full Length Research paper

Prevalence of stunting among school children of Government Urdu Higher Primary Schools in Azad Nagar and its surrounding area, Bangalore

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Children are the future of the country. In India, children under 15 years of age constitute about 40% of the population. School children constitute a large pool of children of this age group. Nutritional status is a major component of school health services. The objectives of the study are (1) To assess the prevalence of stunting among school children of Government Urdu Higher Primary Schools (GUHPS) in Azad Nagar and its surrounding area, Bangalore; (2) To assess anthropometric indices among children; and (3) To make recommendations to the concerned authorities regarding the nutritional needs assessment. The present study was a one-time cross sectional study conducted in the three Government Urdu Higher Primary schools (GUHPS) of Azad Nagar and its surrounding area. A total of 500 children were included in the study. A complete physical examination of the children was done, and deviations from normal were recorded. The prevalence of stunting in the school children was 40.4% (202). The prevalence of stunting in boys was 41.47% (124) and in girls was 38.81% (78). The prevalence of stunting was more in boys compared to girls (41.47 versus 38.81%). In the present study, nutritional status was found highly related to the personal hygiene and socio-economic status of children. Main emphasis should be given towards nutrition education, personal hygiene education, and health education apart from the regular educational activities in the community.

Key words: Stunting, school children, nutrition education.

INTRODUCTION

Children constitute the nation's future human resources (United Nations, 1997). The health of children and youth is of fundamental value (Raghava, 2005). As today's children are the citizens of tomorrow's world, their survival, protection, and development is the prerequisite for the future development of humanity (WHO, 1996). Children are an important part of the total community. They can affect the health of the community, and the community in turn can affect them (John, 1974). A child's entire life is determined in large measures by the food given to him during his first five years. Because childhood is a period of rapid growth and development, nutrition is one of the influencing factors in this period (Shills and Young, 1998). Malnutrition causes a great deal of physical and emotional suffering, and it is a violation of a

child's human rights. Malnutrition substantially raises the risk of infant and child death, and increases vulnerability to a variety of diseases in later life. Children who are undernourished and underweight are likely to be fewer cleavers than if they were well fed. The health of children is of great importance as rapid growth occurs during this period (Shashi, 1990). Good nutrition is a basic requirement for good health, and a living organism is a product of nutrition (Begum, 1997).

It is widely accepted that for practical purposes, anthropometry is the most useful tool for assessing the nutritional status of children. There are many anthropometric indicators in use, such as mid upper arm circumference (MUAC), weight-for-age, height-for-age, weight-for-height, and body mass index (BMI)-for-age for children greater than 2 years old. Most of these indicators need to be used along with specific reference tables, e.g. National Center for Health Statistics (NCHS) tables, for interpreting data (Elizabeth, 2004). This might not be

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possible in overcrowded outpatient departments of common tertiary care hospitals. Therefore, to estimate the expected weight or height of a child rapidly, especially in emergency situations, many field workers and clinicians use formulae first introduced by Weech, using age as variable (Shashi, 1990).

With this recommendation in mind, a study of the prevalence of stunting and anthropometric indices of children of Government Urdu Higher Primary Schools (GUHPS) of Azad Nagar and its surrounding area was carried out. The area contained three schools offering higher primary education, that is 1st to 8th class standard, and all three schools participated in the study. The main objective of the study was to assess the nutritional status, anthropometric indices, and to make early diagnosis of nutritional deficiency of GUHPS children in Azad Nagar and its surrounding area.

METHODOLOGY

Place of study

The study was conducted in GUHPS of Azad Nagar and its adjacent area in Bangalore. The total population of children in the schools was 700. Children between the ages of 5 and 14 years were selected for the study.

Study design

A one-time observational cross-sectional study of GUHPS children was conducted to assess the nutritional status in Azad Nagar government school children. Anthropometric indicators were chosen for the assessment because of a widely used, inexpensive and non-invasive measure of the general nutritional status of an individual or a population group. For example, weight-for-height (wasting) is useful for screening children at risk of malnutrition and for measuring short-term changes in nutritional status.

Study period

This was from January to December, 2010.

Sample size

500 children between 5 to 14 years of age were found in three schools and this constituted the sample size of the research work.

Data collection

Permission was obtained from Basic Siksha Adikari (BSA) as well as from the head masters of the schools, to conduct the study. The schools were visited once a week for the entire year with the exception of holidays, and the data was collected using readymade proforma. The proforma was comprised of personal history, personal hygiene aspects, and all aspects of clinical examination of the children. The data was collected by interviewing and examining the children with the help of the class teacher. The absentees were examined by visiting the school during the next consecutive week. The children were assessed for nutritional status by clinical

examination and anthropometry by doctors and trained researchers.

A complete physical examination of children from head to toe was done and deviations from normal were recorded. The children were examined for clinical signs of any nutritional deficiency. Anaemia was diagnosed by presence of pallor on tongue, nail beds, palpebral conjunctiva. Ear infections were diagnosed on the basis of symptoms, signs and ear discharge on examination. Oedema of feet was examined and thyroid abnormality was also examined.

Height

The height of children was measured using a 200 cm Stature Meter manufactured by BIOCON. The children with bare foot were made to stand on a flat floor with feet parallel and with heels, shoulders and back of head touching the wall. The head was kept erect so that the orbit was in the same horizontal plane as the external auditory meatus. The scale then was brought down making a firm contact with the vertex and was parallel to the floor, readings were recorded to the nearest 0.5 cm.

Weight

The weight was measured in kilograms using electronic digital weighing machine to the nearest measure of 0.1 kg. The children were weighed with minimal clothing, without foot wear and the children were asked to empty the bladder before weighing.

Personal hygiene status

The hygiene status was assessed by interviewing and observing the children. The children were grouped under three categories; good, fair and poor.

Underweight

The children with Body Mass Index (BMI) less than the 5th percentile BMI standards of the National Centre for Health Statistics (NCHS) were considered as underweight (Elizabeth, 2004).

Underweight = BMI <5th percentile of NCHS BMI standard (Elizabeth, 2004).

Data analysis

Data were tabulated in a systematic way for presentation and analysis on the basis of recorded parameter regarding demographic and nutritional profiles. Studied children were classified into different relevant categories. Main emphasis in the present study was on nutritional status, so data related to nutritional indicator were highlighted more and illustrated in detail.

RESULTS AND DISCUSSION

Age

In the present study, 500 children ages 5 to 14 years were included from GUHPS. Out of 500 children, 52 (10.40%) children were 5 years old, 63 (12.60%) were 6 years old, 43 (8.60%) were 7 years old, 51 (10.20%)

Table 1. Distribution of school children according to age.

Age group	No. of children	Percentage (%)
5+	52	10.40
6+	63	12.60
7+	43	8.60
8+	51	10.20
9+	41	8.20
10+	34	6.80
11+	39	7.80
12+	40	8.00
13+	87	17.40
14	50	10.00
Total	500	100

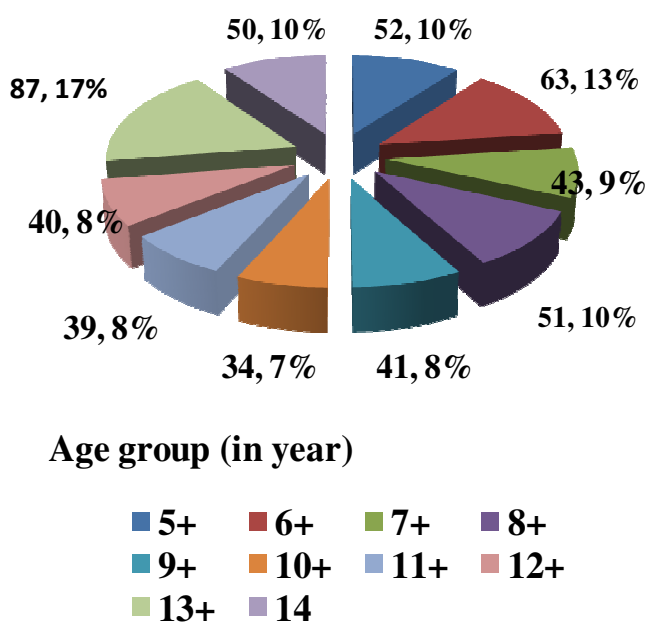


Figure 1. Distribution of school children according to age.

were 8 years old, 41 (8.20%) were 9 years old, 34 (6.80%) were 10 years old, 39 (7.80%) were 11 years old, 40 (8.00%) were 12 years old, 87 (17.40%) were 13 years old, and 50 (10.00%) were 14 years old. Results are summarized in Table 1 and Figure 1.

Sex

In the present study, both boys and girls were included. Out of a total of 500 children, 299 (59.80%) were boys and 201 (40.20%) were girls (Figure 2). The ratio of Girls: Boys was 1:1.49. The difference may be due to the increased inclination of parents towards boys education.

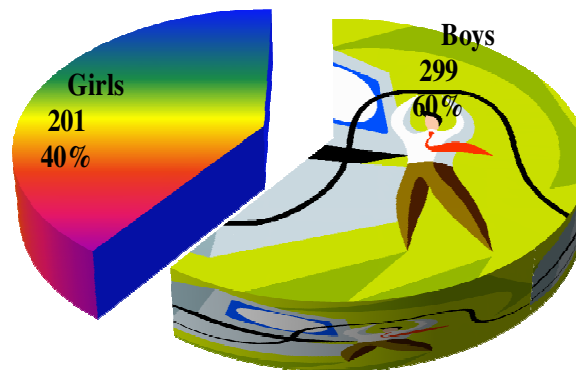


Figure 2. Distribution of children according to sex.

The report of the Directorate of Economics and Statistics, Bangalore (2000 to 2001) revealed less literacy rate in females as compared to males in Bangalore (77% in females versus 88% in males) (Anonymous, 2001). This data supports the findings of the present study, revealing the enrolment of fewer females in comparison to males in schools in Bangalore.

Religion

Out of the total 500 children in the study, 73 (14.60%) children were Hindu and 427 (85.40%) were Muslim. The area of the study was predominantly Muslim and schools were Urdu medium; therefore, it was inevitable that our sample would be mostly Muslim.

Family

When comparing household type, the majority of children belonged to a nuclear household (n = 277, 55.40%). Only 41.20% belonged to a joint family, and 3.40% lived in a three-generation household.

Parent's educational status

In the present study, the majority of children had illiterate parents (57.4% of all mothers and 53.60% of all fathers). A total of 58 (11.60%) children reported that their father had completed education up to Intermediate or PUC or Post High School diploma, whereas only 17.4% of the children reported the same educational attainment by their mothers. A greater percentage of children reported having illiterate mothers compared to illiterate fathers (57.40 vs. 53.60%) (Table 2). This may be due to the population in the study area showing less interest in female education in comparison to male education. As per the report of the Directorate of Economics and Statistics, Bangalore (2000 to 2001), the female literacy

Table 2. Distribution of children according to parent’s educational status.

Educational status	Mother		Father	
	No. of children	Percentage	No. of children	Percentage
Intermediate or PUC or Post High School Diploma	14	2.80	58	11.60
High School Certificate	73	14.60	79	15.80
Primary School or Literate	126	25.20	95	19.00
Illiterate	287	57.40	268	53.60
Total	500	100	500	100

Table 3. Distribution of children according to parent’s occupation.

Occupation	Mother		Father	
	No. of children	Percentage	No. of children	Percentage
Skilled worker	31	6.20	224	44.80
Semi Skilled worker	79	15.80	154	30.80
Unskilled worker	78	15.60	94	18.80
Unemployed (Females- Housewife)	312	62.40	28	5.60
Total	500	100	500	100

Number and % of Children

- Upper Middle (II)
- Lower Middle (III)
- Upper Lower (IV)

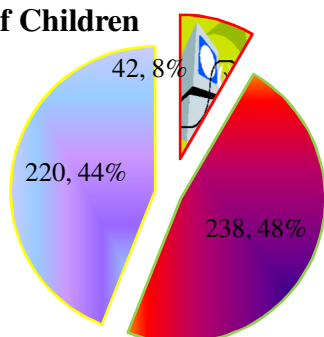


Figure 3. Distribution of school children according to socioeconomic status.

rate was less as compared to male literacy rate in Bangalore (77 versus 88%) (Anonymous, 2001).

In the present study, the literacy rate was even lower than that previously reported. This may be because of lower-middle socioeconomic status of this study population in the area of Azad Nagar.

Parent’s occupation

In the present study, 224 (44.80%) children reported occupationally skilled fathers, 154 (30.80%) had occupationally semi-skilled fathers, 94 (18.80%) had occupationally unskilled fathers, and 28 (5.60%) had occupationally unemployed fathers (Table 3). The majority of children reported occupationally unemployed

mothers (n = 312, 62.40%), while a small minority reported occupationally skilled mothers (n = 31, 6.20%). The unemployment was more frequent in mothers in comparison to fathers of the children (62.40 versus 5.60%), which may be due to the lower literacy rate and fewer opportunities for jobs for the uneducated.

Socioeconomic status (SES)

Out of a total of 500 children in the study, 42 (8.40%) children were classified as upper middle (II) SES, 238 (47.60%) children were lower middle (III) SES, and 220 (44.00%) children were upper lower (IV) SES (Figure 3). The majority of children were lower middle (III) SES. This can be attributed to lower educational and occupational status of parents, especially of the fathers.

Underweight

The overall prevalence of underweight in the studied school children was 58.20% (291) (Figure 4). The prevalence of underweight was greater among boys compared to girls (65.55 versus 47.26%). This may be due to improper dietary habits and/or lack of knowledge of importance of balanced and nutritious diets in boys and their parents. Inclination of boys towards the snacks may be a factor. A study conducted by Patwari et al. (1979) in the Kathua District of Jammu and Kashmir reported the prevalence of underweight as 60.4% of the study population (Patwari et al., 1979).

In another study, Joseph et al. (2002) from rural areas

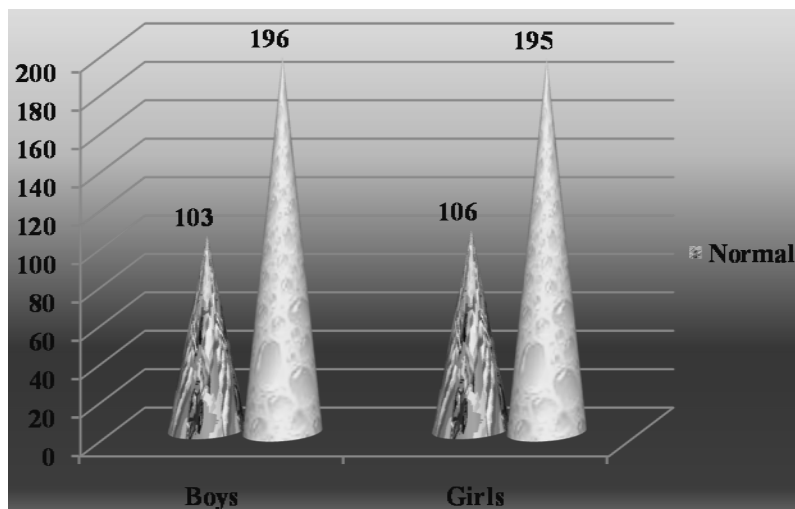


Figure 4. Prevalence of underweight according to sex in school children.

Table 4. Prevalence of stunting according to age and sex.

Age (years)	Boys (n = 299)		Girls (n = 201)		Total	
	No. of children	Percentage	No. of children	Percentage	No. of children	Percentage
5+	26	70.27	8	53.33	34	65.38
6+	38	86.36	15	78.95	53	84.13
7+	19	79.17	14	73.68	33	76.74
8+	13	65.00	21	67.74	34	66.67
9+	14	43.75	3	33.34	17	41.46
10+	3	15.00	3	21.43	6	17.65
11+	1	4.55	4	23.53	5	12.82
12+	1	3.45	4	36.36	5	12.50
13+	5	11.63	4	9.09	9	10.34
14	4	13.33	2	10.00	6	12.00

of Karnataka state reported prevalence of underweight as 60.4% (Joseph et al., 2002). The prevalence of underweight in this present study was lower as compared to reference studies. Both the reference studies were conducted in private as well as government schools with a large sample size as compared to sample size of the present study. Apart from sample size difference, underweight may be attributed to the increasing knowledge and consciousness about overweight. High social class individuals try to maintain weight at a minimum.

Stunting according to age and sex

In the present study, the prevalence of stunting in the age group "5 was 65.38% (34), in 6+ age group the prevalence was 84.13% (53), in 7+ age group the prevalence was 76.74% (33), in 8+ age group the prevalence was 66.67% (34), in 9+ age group the prevalence was

41.46% (17), in 10+ age group the prevalence was 17.65% (9), in 11+ age group the prevalence was 12.82% (5), in 12+ age group the prevalence was 12.5% (5), in 13+ age group the prevalence was 10.34% (9), and in the 14 age group the prevalence was 12% (6). (Table 4) The prevalence was highest in 6+ age group 84.13%.

Among the boys, the prevalence of stunting in the age group 5+ was 70.27% (26), in 6+ age group the prevalence was 86.36% (38), in 7+ age group the prevalence was 79.17% (19), in 8+ age group the prevalence was 65% (13), in 9+ age group the prevalence was 43.75% (14), in 10+ age group the prevalence was 15% (3), in 11+ age group the prevalence was 4.55% (1), in 12+ age group the prevalence was 3.45% (1), in 13+ age group the prevalence was 11.63% (5) and in 14 age group prevalence was 13.33% (4), respectively. The prevalence was highest in the age group of 6+ (86.36%).

Among the girls, the prevalence of stunting in the age group 5+ was 53.33% (8), in 6+ age group was 78.95%

Table 5. Prevalence of stunting in school children.

Status	Boys (n = 299)		Girls (n = 201)		Total (n = 500)	
	No. of children	Percentage	No. of children	Percentage	No. of children	Percentage
Normal	175	58.53	123	61.19	298	59.60
Stunting	124	41.47	78	38.81	202	40.40
Total	299	100.00	201	100.00	500	100.00

(15), in 7+ age group was 73.68% (14), in 8+ age group was 67.74% (21), in 9+ age group was 33.34% (4), in 10+ age group was 21.43% (3), in 11+ age group was 23.53% (4), in 12+ age group was 36.36% (4), in 13+ age group was 9.09% (4) and in 14 age group was 10% (2). The prevalence was highest in the age group of 6+ (78.95%). The overall prevalence of stunting in this study was 40.4% (202). The prevalence of stunting in boys was 41.47% (124) and in girls was 38.81% (78). (Table 5) The prevalence of stunting was more in boys compared to girls (41.47 versus 38.81%). This may be due to improper dietary habits, lack of knowledge of balanced diet in boys and their parents. A study conducted by Panda et al. (2000) in school children of Ludhiana city reported prevalence of stunting as 26.28% (Panda et al., 2000). A study conducted by Semwal et al. (2006) in Dehradun reported prevalence of stunting as 26.3% (Semwal et al., 2006). A study conducted by Josheph et al. (2002) in rural Karnataka reported prevalence of stunting as 38.6% (Josheph et al., 2002).

In the present study, the prevalence of stunting was more compared to the aforementioned studies. This may be due to improper dietary habits, lack of knowledge of balanced diet in children, in parents and lack of availability of protein rich diets to the children. This may all attribute to the lower socio economic status and inability to fulfil the dietary requirement of their children as per need. The first effect of poor dietary intake is on growth, which was obvious in the present study. More study should be conducted focusing the factors responsible for the nutritional deficiencies in the under study population. Moreover mid-day meal quality should be improved, so that it can supplement the deficiencies properly, the goal of midday meal should not be only to quench the hunger, rather it should be more nutritious and it needs catering.

Conclusion

The overall prevalence of stunting in this study of school children was 40.4% (202). The prevalence of stunting is more in the lower middle (III) socio-economic status children than the other socio-economic status children. The health status is found highly related to the personal hygiene. The overall prevalence of underweight in the studied school children was 58.20% (291). The prevalence of underweight in boys was 65.55% (191) and

in the girls, it was 47.26 (95). The prevalence of underweight was more among boys compared to girls (65.55 versus 47.26%).

RECOMMENDATIONS

The recommendations to improve the health status of the school children are as follows:

1. Health education, personal hygiene education, nutrition education may be incorporated into the school curriculum apart from the regular educational activities in the community;
2. Improvement of home hygiene and health services;
3. Protected water supply, better drainage facilities, and daily garbage clearance;
4. Creation of facilities for improving economic status of the population in the study area;
5. Alleviation of poverty;
6. Better school health services may be planned periodically for the school children; and
7. Production of local fresh food.

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