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Research Article

A CROSS SECTIONAL OBSERVATIONAL HEALTH SURVEY ON NUTRITIONAL STATUS OF FIRST STANDARD STUDENTS OF URBAN AREA OF HASSAN DISTRICT OF KARNATAKA STATE

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ABSTRACT

Nutritional needs change throughout life, depending on genetics, rate of growth, activity and many other factors. Nutritional status is the condition of health of the individual as influenced by the utilization of nutrients. The present status of malnutrition in India is that a devastating half of all the new-borns are malnourished and 30 per cent are born underweight making them more vulnerable to further malnutrition and diseases. The major objective of this research is "To assess the nutritional health status of first standard students (6-7 years) of an urban area in Hassan district." 572 children studying in first standard class was selected from eight different schools in urban area of Hassan district of Karnataka state. They were assessed for nutritional health status by applying the standard growth chart of World Health Organization. It was observed that under the category of malnutrition the percentage of under nutrition is more compared to over nutrition.

Keywords: Nutritional Status, Growth And Development, Malnutrition, Under Nutrition, Over Nutrition.

INTRODUCTION

Appropriate nutrition practices play a pivotal role in determining optimal health and development of children¹. Malnutrition is a major public health emergency in India today, with about 50% of the population suffering from it in some form - protein-calorie deficit or micro-nutrient malnutrition. Malnutrition refers to the situation where there is an unbalanced diet in which some nutrients are in excess, lacking or wrong proportion². Even if it does not lead to death, malnutrition including micronutrient deficiencies, often leads to permanent damage including impairment of physical growth and mental development, and to added health care costs to the state¹. The level of child under nutrition remains unacceptable throughout the world, with 90 per cent of the developing world's chronically undernourished (stunted) children living in Asia and Africa³. 19% of world's children live in India⁴. More than one third of the world's children who are wasted live in India³. India are a home to more than one billion people, of which 42 per cent are children⁴. More broadly, malnutrition in India is in a state of silent emergency

and thereby demands greater priority than ever before. The nutritional status of population is therefore critical to the development and well-being of the nation⁴. The present status of malnutrition in India is that a devastating half of all the new-borns are malnourished and 30 per cent are born underweight making them more vulnerable to further malnutrition and diseases⁴.

The Nutrition Scenario in Karnataka compared to other Southern states is also a cause for concern. For example, the IMR in Karnataka according to NFHS III is 43 as compared to 30.4 and 15.3 in Tamil Nadu and Kerala respectively⁵. Despite India's 50% increase in GDP since 1991, more than one third of the world's malnourished children live in India⁶. Nutritional anthropometry occupies a central role in the assessment of the nutritional status of an individual or groups of children, particularly in developing countries. A number of studies have demonstrated the association between increasing severity of anthropometric deficits and mortality, and the substantial contribution to child mortality of all degrees of malnutrition is now widely accepted⁷. In addition, there is strong evidence that impaired growth is associated with delayed mental

development, poor school performance, and reduced intellectual capacity⁸⁻¹⁰. There are innumerable studies on the growth and nutrition monitoring of Under Five children but the studies on the children of school going age group are not many in literature. So, through the present study entitled "A cross sectional observational health survey on nutritional status of first standard students of urban area of Hassan district of Karnataka state" an attempt has been made to assess the nutritional status of 1st standard students.

MATERIALS AND METHODS

Method of Study: The present study was a cross sectional health survey conducted among the 1st standard school children (6-7 years) of Hassan. The health survey was designed to assess the nutritional status of the children. Outcome analysis in surveys represents the sum total of the group and cannot reflect each individual's concern. A health survey has a much wider connotation compared to a morbidity survey.

Method of Selection: Eight schools of Hassan urban area were selected randomly for the study such that it would represent whole of the population. It includes two government schools, two upper class schools and four ordinary schools so as to cover the whole population belonging to various socio-economic groups. One among the ordinary schools was a girls' school. It was selected to see the nutritional status absolutely in girls. The eight schools selected for the study along with the samples is shown in table 1.

Inclusion criteria: Children of 1st standard, studying in different schools of Hassan was included in the study.

Exclusion Criteria: Children having congenital diseases and school dropouts were excluded. The children fulfilling the inclusion criteria were selected for the study.

Assessment criteria: Anthropometric measurements - weight, height, head circumference, and chest circumference, mid arm circumference, skin fold thickness (triceps and sub scapular region).

Method of visit: Initially the school authorities were approached to explain them the purpose and need of the study and transportation facility was provided to them. The study setting was the out-patient department of Kaumarabritya department of SDM College of Ayurveda and Hospital, Hassan. The students were divided into batches for making the study easier.

Method of collection of data

The method of study was by interrogation, examination and collection of details from each child and teacher (if necessary) from the selected schools. The nature, purpose and objective of the study were explained to both students and teacher before starting the work. The required data was collected by using the proforma designed for the purpose of study. After recording the vital data like age, sex, religion, economic status etc., each child was examined in general and for clinical nutritional status in particular. The ages of the children were obtained from birth record maintained in the school. For the assessment of growth and nutritional status, anthropometric measurement such as height, weight, head circumference, chest circumference, mid arm circumference and skin fold

thickness was recorded. All the measurements were taken as per guideline of World Health Organization. Anthropometry is the single most universally applicable, inexpensive, and non-invasive method available to assess the size, proportion and composition of human body. World Health Organization has recommended various indices based on anthropometry to evaluate the nutritional status of children¹¹. An attempt has been made to assess the nutritional status of school age children (1st standard) of Hassan, using World Health Organization recommended anthropometric indices.

Instruments Used For Study: Weighing Machine, Height measuring scale, Measuring tape, Stethoscope, Torch and Skin calliper.

Weight: Electronic weighing machine was taken for measuring the body weight

Height: Recorded using height measuring scale

Head Circumference: Maximum circumference of the head from occipital protuberance to the forehead was measured in centimeter.

Chest Circumference: Is measured with measuring tape at the level of nipples in centimeter.

Mid arm circumference: Measured by passing a tape around the mid-point of right arm in centimeter.

Skin fold thickness: The subcutaneous fat thickness is measured with the help of skin calliper over triceps and sub scapular region.

Assessment of Nutritional Status

It was done on the basis of anthropometrics measurements of the children, by comparing the values with standard growth charts. Anthropometry is the single most universally applicable, inexpensive and non-invasive method available to assess the size, proportion and composition of human body¹². According to World Health Organization, the ultimate use of nutritional assessment is to improve human health¹¹.

The standard growth charts: Weight for age, Height for age, Weight for height, BMI for age, Head circumference for age. Child below 5th percentile (80% of the expected measurements) for any measurements are considered as undernourished. Child above 95th percentile (120 % of the expected measurements) is considered as overweight. Attempt has been made to classify the nutritional status for all three basic indices, namely weight for age, weight for height and height for age.

- Stunting - deficit in height for age
- Wasting - deficit in weight for height
- Underweight - deficit in weight for age

Along with the anthropometric measurements, all the students participated in the study were observed for any specific deficiency disease. After the collection of necessary data for the study, all the school children were taught about maintenance of good health, personal hygiene and importance of nutritional diet. Various factors like socioeconomic status, type of family diet, religion and other influencing factors were analysed for their effect on nutritional status.

Statistical Analysis: Data collected was tabulated and analysed statistically.

OBSERVATIONS AND RESULTS

The data collected were classified as follows for easy assessment.

A. Demographic data

B. Data relating nutritional status

A. Demographic data

Sex wise distribution of subjects shows that 51.22% (n=293) were girls and 48.88% (n=279) were boys. Religion wise distribution of subjects shows that 91.25% (n=522) of the children belonged to Hindu religion, 8.22% (n=47) were Muslims and only 0.53% (n=3) were Christians. Diet wise distribution shows that 12.24% (n=70) were vegetarian and 87.76% (n=502) were of mixed diet. Family wise distribution shows that 15.21% (n=87) were belonging to joint family and 84.79% (n=485) belongs to nuclear family. The socio-economic status based distribution showed that 48.76% (n=279) children belonged to low socio economic status followed by 43.36% (n=248) and 7.87 % (n=45) were belonged to middle and high socio economic status respectively. General appearance wise distribution showed that 73.08% (n=418) were having normal built followed by 25.52% (n=146) were having thin built and only 1.4% (n=8) children were obese.

B. Data relating nutritional status

Weight wise distribution showed that 83.21% (n=476) were having normal weights followed by 15.4% (n=88) were having under-weight and only 1.39% (n=8) were overweight. Among undernourished 11.82% (n=33) were boys and 18.77% (n=55) were girls. Height wise distribution showed that 90.55% (n=518) were having normal heights followed by 9.44 % (n=54) were stunted. Among stunted children, 7.52% (n=21) were boys and 11.26% (n=33) were girls. When observing the weights of all 572 children, majority i.e. 74.48% (n=426) were having normal weight for height, followed by 25.53% (n=146) were under weight (undernourished). Among undernourished 21.14% (n=59) were boys and 29.69% (n=87) were girls. BMI wise distribution showed that 69.76% (n=399) were having normal weight, 29.02% (n=166) were under weight and only 1.22% (n=7) were overweight. When observing the mid arm circumference of all 572 children, 11.01% (n=63) are having MAC less than normal for that particular age, they are considered as undernourished. Among them also girl's ratio 12.29% (n=36) was more. 12.93% (n=74) were having Head circumference less than normal, for that particular age, they are considered as undernourished. Among these, girl's percentage (16.38%) was more than boys. 17.48 % (n=100) were having Chest circumference less than normal for that particular age, and they are considered as undernourished. In them girl's ratio (22.87%) was more than the boys. 12.24% (n=70) were vegetarian among them 17.14% (n=12) are undernourished and 87.76% (n=502) were of mixed diet among them 15.14% (n=76) are undernourished. It was observed that more number of undernourished children was belonging to vegetarian diet. 7.87% (n=45) were belonging to high socioeconomic status among them 2.22% (n=1) was undernourished and 43.36% (n=248) were belonging to middle socioeconomic status among them 6.04% (n=15) were undernourished and 48.76% (n=279) were belonging to low socioeconomic status among them 25.80% (n=72) were undernourished. 84.79% (n=485) were belonging to nuclear family among them 10.92% (n=53) were undernourished and 15.21% (n=87) were belonging to joint family among

them 28.74% (n=25) were undernourished. 91.25% (n=522) of the children were belonged to Hindu religion among them 13.98% (n=73) were undernourished and 8.22% (n=47) were Muslims among them 31.91% (n=15) were undernourished and only 0.53% (n=3) were Christians with no undernourished child. It was observed that more number of undernourished children is from Muslim community. Examination of the eyes of the children showed that 81.11% (n=464) of children's eyes were normal, 18.53% (n=106) were having pale conjunctiva and 0.35% (n=2) were having Bitot's Spot. Examination of the lips of the children showed that 541 (94.58 %) of the children were having normal lips, 2.62% (n=15) were having Angular Stomatitis and 2.72% (n=16) were having cheilosis. Examination of the tongue of the children showed that 93.18% (n=533) were having normal tongue, 0.7% (n=4) were having Red tongue and 6.12% (n=35) had Pale tongue. Examination of the teeth of the children showed that 51.05% (n=292) were having normal teeth and 48.95% (n=280) were having dental caries. Examination of the tonsils of the children showed that 551 (96.32 %) children were having normal tonsils and 21 (3.68 %) were having enlargement of tonsils. Examination of the nails of the children showed that 572 children maximum 455 (79.55 %) were normal, 96 (16.78 %) were having pale nail and 18 (3.15%) were having flat nail and 3 (0.53 %) had clubbing of nail. Examination of the skin of the children showed that 87.76% (n=502) were normal, 5.94% (n=34) were having white patches over the face, 2.8% (n=16) were having fungal infections and 2.45% (n=14) had Phrynoderma, 1.05% (n=6) were having scabies. The prevalence of skin disease was more in boys compared to girl. Examination of the respiratory system of the children showed that 89.68% (n=513) were normal and 6.82% (n=39) were having upper respiratory tract infection and 3.49% (n=20) were having Bronchial Asthma. Examination of the gastro-intestinal system of the children showed that 88.31% (n=506) children were not having any G.I disturbances and 11.69% (n=66) had pain in abdomen. Examination of specific deficiency (by clinical examination) showed that 24.48% (n=140) were having specific deficiency diseases. Out of which 21.1 % (n=59) were boys and 27.65% (n=81) were girls. Among them 106 (41 boys + 65 girls) were having Nutritional anaemia followed by stomatitis and cheilosis 31 (16 boys+ 15 girls), Bitot's Spot 2 (1 boys + 1 girl), and bleeding gums 1 (boy). Examination of systemic diseases showed that among 195 diseased children 59 (28 boys+31 girls) were suffering from respiratory infection, 66 (29 boys+37 girls) were having gastro intestinal disturbances, 70 (44 boys+26 girls) had skin diseases. Among diseased children with respiratory and GIT disturbance boys percentage is more than girls, whereas among skin diseases girls (13.33%) percentage is less compared to boys (22.56%).

Among all 8 schools, more number of undernourished students 50.76% (n=37) were from 2 government schools and least from private schools 7.91% (n=20). The distribution of malnutrition across the eight different schools is shown in table 2. 9.44% (n=54) were stunted, 15.38% (n=88) were underweight and 25.52% (n=146) were wasted, and 1.39 % (n=8) were overweight. The distribution of students according to the types of malnourishment is shown in table 3.

DISCUSSION

As per the World Health Organization reference standards, prevalence of stunting, wasting, and underweight as markers of under nutrition and were found to be 9.44%, 25.52% and 15.4% of children respectively in children of Hassan studying in 1st standard.

Among undernourished students more (50.91 %) were from government schools, as against least 7.91% from private schools. It indicates the importance of education of parents, socioeconomic status, availability of nutritional food, knowledge of nutritional food. And 3.16 % of students from private schools were found to be overweight. This may be due to the over caring and extra facilities given to the children from high socioeconomic status, which (over nutrition) is also not good.

Anthropometric Measurements¹³:

Weight: Among 572 students who participated in the study, 15.38 % were under-weight while only 1.39% was overweight and the remaining 83.22% were of normal weight for the age. Among underweight, girls (18.77%) predominated than boys (11.82%). This may be because the female child is less cared in our country. As India is a developing country, the children present here are having less weight compared to the developed countries whenever there is nutritional deficiency the weight is the first index, which gets affected. In the present study less percentage of overweight students was present; it indicates that under nutrition is more prevalent than over nutrition among school children of Hassan.

Height: Out of 572 first standard students, 9.44 % of students were stunted (height < 5th percentile), while the remaining 90.55% were having normal height for the age. Among them girls (11.26 %) percentage was more than boys (7.52%). The girl's percentage is more due to neglect of girl child and social stigma. In nutritional deficiency the weight declines before the length and weight for height is low. Nutritional deprivation over a period of time (over 6 months) affects the linear growth of a child. Stunting is an indicator of past growth failure. It is associated with a number of long-term factors including chronic insufficient protein and energy intake, frequent infection, sustained inappropriate feeding practices and poverty. In children over 2 years of age, the effects of these long-term factors may not be reversible. In the present study most of the children were belonging to low socioeconomic status, which might be the cause for stunting.

Weight for height: Out of 572 students, 25.53 % were wasted and the remaining 74.48 % were having normal weight for height. Among wasted students girls (29.69%) percentage was more than boys (21.14%).

Wasting indicates current or acute malnutrition resulting from failure to gain weight or actual weight loss due to different causes like inadequate food intake, incorrect feeding practices, disease, and infection or, more frequently, a combination of these factors. Wasting in individual children and population groups can change rapidly and shows marked seasonal patterns associated with changes in food availability or disease prevalence to which it is very sensitive. In the present study more number of students are wasted (25.52%) rather than stunting (9.44%) and underweight (15.38%), this might be

because of acute malnutrition where the weight is affected but the height will not be affected.

Body Mass Index (BMI): When the BMI of all 572 students was calculated 29.02 % were having BMI less than 3rd percentile which indicates under nutrition, among them girls percentage was more than boys. Only 1.22% students were having BMI more than 95th percentile, indicating overweight. And the remaining 69.76 % were having the normal BMI for the age. BMI is in accordance with height and weight.

Head Circumference: Out of 572 students 12.93 % were having less HC and 77.97 % were having normal HC. The students with less HC are considered as undernourished among them girls percentage (16.38 %) was more than the boys (9.32 %). Less HC might be because of familial tendency of small sized head, or Chronic and severe under nutrition in infancy can also depress head growth. This may be an insignificant data because the increase in the head circumference after 3 years of age is minimal.

Chest Circumference (CC): Out of 572 students 17.48 % were having CC less than normal while the remaining 77.97 % were having normal CC. among those who had less CC girls (22.87%) percentage was more than boys (11.83%). indicating the prevalence of malnutrition is more in girls. As in under nutrition whole body will be lean the CC will also be less.

Mid Arm Circumference (MAC): In the present study out of 572 students, 11.01 % of students were having less MAC while the remaining 88.99 % had normal MAC. Among the undernourished girls (12.29%) percentage was more compared to boys (9.68%). As in this age group the fat is replaced by muscle. This is not considered as standard criteria or there should have been chronic malnutrition.

Under nutrition: In the present study, 15.38 % were under weight, 9.44 % were stunted and number of wasting was 25.53 %. The stunting reflects the chronic malnutrition. Underweight and wasting reflects the acute or current malnutrition. The findings of present study indicate that malnutrition of children was both due to long-term deprivation as well as from recent causes.

Height for age reflects achieved linear growth, and its deficit (stunting) reflects long-term malnutrition (inadequate health and nutrition), and is influenced by parental attitudes and childcare practices accumulating over a long period of time. Stunting of the older children is a legacy of nutritional deprivation during early childhood. On the other hand, underweight and wasting reflect an acute phenomenon secondary to different ailments. In the present study stunting percentage was less compared to the wasting and underweight. It might be because of the fact that, as the child starts to go to schools his food habits are disturbed may be due to his psychological disturbances, because of school fear, not interested in studies, because of extra playing in schools etc.

Nutritional Deficiency: Among other specific nutritional deficiencies, the study reported 0.35% of children with Bitot's spots (deficiency of vitamin A) and 18.53 % pallor cases (Nutritional anaemia) and 5.42 % cases of angular stomatitis cheilosis (deficiency of vitamin B2) were observed to be co-existence with malnutrition.

Prevalence of diseases: 29.55 % children suffering from different ailments like, gastrointestinal problems such as

abdominal pain 33.84 %. The probable causes may be irregular food habits and irregular bowel habits, intestinal parasites. Respiratory problems like upper respiratory tract infections, Rhinitis, Bronchial asthma 30.25 %. Then 35.89 % children were suffering from skin diseases mainly white patches (5.94%) over face (Pityriasisalba) phrynoderma (2.45%), fungal infections (2.85%) and scabies (1.05%). It is due to poor nutritional status and unhygienic condition of the children. Among skin diseased children, boy's ratio (22.56%) was more than girls (13.33%), this may be because of better personal hygienic condition in girls. It shows that there is a prevalence of morbidity rate in the schools, indicating that malnutrition is directly proportional to increased morbidity consequent upon reduced body defence mechanism.

CONCLUSION

From the overall study it was observed that under the category of malnutrition the percentage of under nutrition (15.38%) is more compared to over nutrition (1.39%). Thus in the present study prevalence of under nutrition was mainly observed. As India is one among developing country were poverty, illiteracy, lack of awareness are observed more, which have their effect over the child's nutrition. There was lack of knowledge of health, nutritional status and personal hygiene and because of poor socioeconomic status of the family, illiteracy among parents etc. that had their effect on nutritional status of children. These all things together made the school children to suffer from various types of malnutrition. Nutrition is a core pillar of human development and concrete, large-scale programming not only can reduce the burden of under nutrition and deprivation in countries but also can advance the progress of nations.

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Table 1: Showing the eight schools selected for the study along with the samples

SI No	Name of the School	No. of Student
1	Siddeshwar Convent, Tanniruhalla	30
2	NiveditaVidyalaya, Aralipete	40
3	SVM English School Vijay Nagar	54
4	Government Higher Primary School D M Halli	32
5	Hoysala School, Halubaagilu Road	34
6	St Philomina Girls School, Holenarasipura Road	94
7	Government Higher Primary School Santepete	35
8	Vijay English School, K R Puram Hassan	253
Total	8 schools	572

Table 2: showing the distribution of malnutrition across eight different schools

Sl. No.	Name of school	No of students	Boys	Girls	Stunting	Under weight	Wasting	Over weight
1	Siddeshwar Convent	30	19	11	2 (6.67%)	2 (6.67%)	5 (16.67%)	0
2	NiveditaVidyalaya	40	26	14	7 (17.5%)	12 (30%)	11 (27.5%)	0
3	SVM School	54	31	23	1 (1.85 %)	5 (9.26 %)	9 (16.67%)	0
4	SarakaariHiriyaPratahmiakashale D.M Halli	32	19	13	7 (21.88%)	16 (50%)	23 (71.88%)	0
5	Hoysala Convent	34	21	13	1 (2.94%)	3 (9.68%)	11 (32.35%)	0
6	St Phelomina Girls School	94	0	94	8 (8.5%)	13 (13.83%)	36 (38.3 %)	0
7	SakakariPrathamika Shale Santepete	35	20	15	14 (40 %)	18 (51.43%)	20 (57.14%)	0
8	Vijaya English School	253	143	110	14 (5.53%)	20 (7.91%)	31 (12.25%)	8 (3.16%)
	Total	572	279	293	54 (9.44%)	88 (15.38%)	146 (25.52%)	8 (1.39%)

Table 3: showing the distribution of children according to the types of malnourishment

Type of malnourishment	Number of students	Percentage
Stunting	54	9.44
Under weight	88	15.38
Wasting	146	25.52
Over weight	8	1.39

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