Research Article

Nutritional and health profile among residential school children in rural areas of YSR Kadapa district of Andhra Pradesh, India

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ABSTRACT

Background: Malnutrition is a significant problem in school going children all over the world particularly in developing countries. Factors related to the malnutrition may vary from region to region and part to part of the world. The main aim was to study the health status and nutritional problems among the school children residing in the residential schools.

Methods: Cross sectional study conducted at residential schools around Kadapa among students (boys and girls) in age group 10 to 13 years. Total 393 students were selected from four different schools and divided in to the two categories and three age groups study was conducted in one month (December 2011) with personal interviews of students in preformed questionnaire followed by general examination and laboratory tests.

Results: 393 students were enrolled in the study 213 (54.2%) boys and 180 (45.8%) girls, 10-11 years 122 (31.04%), 11-12 years 132 (33.59%) and 12-13 years 139 (35.37%) participants were enrolled. Following morbidity conditions were observed among participants, URI 91 (23.16%), pediculosis 97 (24.68%), scabies 63 (16.03%), worms in stool 62 (15.78%), refractive errors 49 (12.47%), ear 17 (4.33%), dental carries 79 (20.10%), vitamin A deficiency 42 (10.69%), vitamin B deficiency 101 (25.7%), anemia 177 (45.04%) participants.

Conclusions: Anemia is one of the leading causes of morbidity among the school going children with vitamin deficiency. Apart from that, conditions related with personal hygiene are also present like pediculosis, scabies and worm infestations. Respiratory tract infections are common and repeated attacks of respiratory infections are present among the participants.

Keywords: Nutritional status, School children, Adolescent, Residential schools

INTRODUCTION

Malnutrition is a significant problem among school going children all over the world particularly in developing countries. Factors related to the malnutrition may vary

from region to region and part to part of the world. But basic problem remains the same like poverty, illiteracy and unequal distribution of food to the residents in particular areas. As majority of school children are in adolescent age group and this period is transitory period

of life from childhood to adulthood any nutritional imbalance in this period will adversely affect life in long term. Growth during this period is faster and good nutrition is required to keep up the pace of growth. Anemia, particularly iron deficiency anemia is the major cause for nutritional problem among the adolescents and it affects the growth and development. It may hamper the immunity in this age group and precipitate recurrent infections.

Mild to moderate iron deficiency anemia decreases learning ability and reduces the concentration. At the same time residential school inmates may suffer from the other health problems like skin diseases, recurrent respiratory infections and worm infestations due to the improper hygienic conditions of residential schools. All over the world adolescents' population is significant. In India they contribute to almost 20% of whole population.¹

Neglecting such important group may have significant negative impact on health indicators. Besides malnutrition other morbidity conditions are also important in the growth and development of adolescent. As per the data published by one survey 2-3% of adolescent boys and girls are obese and 10-12% of adolescent boys and girls are overweight.²

The main aim was to study the health status and nutritional problems among the school children residing in the residential schools.

METHODS

Study design: It is cross sectional study.

Study setting: Study was performed in residential schools around Kadapa, India.

Study population: This study includes students (boys and girls) in age group 10 to 13 years.

Study sample: Total 393 students were selected from four different schools and divided in to the two categories (male and female) and three age groups.

Study duration: This study was conducted for one month (December 2011).

Study method: Personal interviews of students in preformed questionnaire followed by general examination and laboratory tests.

Study analysis: Study analysis done in excel format with percentage.

Consent: It was obtained from school Principal and confidentiality of participants ensured.

Ethical approval: Ethical approval was obtained from Institutional ethics committee.

RESULTS

Total 393 students were enrolled in the study out of that 213 (54.2%) were boys and 180 (45.8%) were girls, as per age wise distribution of participants in 10-11 years age group 122 (31.04%), in 11-12 years age group 132 (33.59%) and 12-13 years age group 139 (35.37%) participants were enrolled (Table 1).

Table 1: Distribution of study participants as per age and sex.

Age group (years)	Boys n (%) N=213	Girls n (%) N = 180	Total n (%) N = 393
10-11	65 (30.51)	57 (31.67)	122 (31.04)
11-12	72 (33.80)	60 (33.33)	132 (33.59)
12-13	76 (35.68)	63 (35)	139 (35.37)
Total	213	180	393

91 (23.16%) participants complained about URI out of that 51 (23.94%) were boys and 40 (22.23%) were girls. Pediculosis was reported among 97 (24.68%) participants and 37 (17.37%) were boys and 60 (33.33%) were girls which is slightly more. Scabies was present 63 (16.03%) participants 35 (16.43%) were boys and 28 (15.56%) were girls; scabies was slightly more among boys compared with girls. Total 62 (15.78%) participants reported history of passing worms in stool, out of that 38 (17.84%) were males and 24 (13.33%) were females. Ocular morbidity 49 (12.47%) were having refractive errors out of that 20 (9.39%) were boys and 29 (16.11%) were girls. 17 (4.33%) participants complained about ear problems. Dental carries were present among 79 (20.10%) participants, 42 (19.72%) boys and 37 (20.56%) girls complained about the problem. 42 (10.69%) participants were found with signs of Vitamin A deficiency out of that 20 (9.39%) were boys and 22 (12.22%) were girls. Vitamin B deficiency was present among 101 (25.7%) participants, 49 (23%) were boys and 52 (28.89%) were girls. Prevalence of anemia was present among 177 (45.04%) participants and out of that 66 (30.99%) boys were anemic and for 111 (61.67) girls were anemic (Table 2).

Above table shows that about 109 (51.17%) were having normal BMI and very few were overweight 9 (4.23%) and obese 6 (2.82%). But 50 (23.47%) were in grade I under nourished at the same time 31 (14.55%) and 8 (3.76%) grade II and grade III under nourished respectively (Table 3).

Among girls 88 (48.89%) were having normal BMI. But 51 (28.33%) were grade I under nourished, 18 (10%) and 10 (5.56%) were grade II and grade III undernourished respectively (Table 4).

As per the WHO criteria 197 (50.13%) participants were having normal BMI but almost 101 (25.70%) were grade I under nourished, 49 (12.47%) were grade II under

nourished and 18 (4.58%) were grade III under nourished. Only 19 (4.83%) were overweight and 9 (2.29%) were obese (Table 5).

Table 2: Morbidity pattern among study participants.

Morbidity	Boys n (%) N=213	Girls n (%) N = 180	Total n (%) N = 393
URI	51 (23.94)	40 (22.23)	91 (23.16)
Pediculosis	37 (17.37)	60 (33.33)	97 (24.68)
Scabies	35 (16.43)	28 (15.56)	63 (16.03)
Worms in stools	38 (17.84)	24 (13.33)	62 (15.78)
Refractive errors	20 (9.39)	29 (16.11)	49 (12.47)
ENT problems	10 (4.69)	7 (3.89)	17 (4.33)
Dental carries	42 (19.72)	37 (20.56)	79 (20.10)
Vit A deficiency	20 (9.39)	22 (12.22)	42 (10.69)
Vit B deficiency	49 (23)	52 (28.89)	101 (25.7)
Anemia	66 (30.99)	111 (61.67)	177 (45.04)

Table 3: Nutritional status of boys as per BMI (N=213).

Age group (years)	<16 (grade III)	16-17 (grade II)	17-18.5 (grade I)	18.5-24.99 (normal)	25-29.99 (overweight)	>30 (obese)	Total
10-11	4 (1.88)	7 (3.29)	10 (4.69)	39 (18.31)	3 (1.41)	2 (0.94)	65 (30.52)
11-12	2 (0.94)	15 (7.04)	19 (8.92)	31 (14.55)	2 (0.94)	3 (1.41)	72 (33.80)
12-13	2 (0.94)	9 (4.23)	21 (9.86)	39 (18.31)	4 (1.88)	1 (0.47)	76 (35.68)
Total	8 (3.76)	31 (14.55)	50 (23.47)	109 (51.17)	9 (4.23)	6 (2.82)	213

Figures given in parenthesis are percentages.

Table 4: Nutritional status of girls as per BMI (N=180).

Age group (years)	<16 (grade III)	16-17 (grade II)	17-18.5 (grade I)	18.5-24.99 (normal)	25-29.99 (overweight)	>30 (obese)	Total
10-11	4(2.22)	7(3.89)	12(6.67)	30(16.67)	3(1.67)	1(0.56)	57 (31.67)
11-12	3(1.67)	6(3.33)	17(9.44)	32(17.78)	2(1.11)	0	60 (33.33)
12-13	3(1.67)	5(2.78)	22(12.22)	26(14.44)	5(2.78)	2(1.11)	63 (35)
Total	10(5.56)	18(10)	51(28.33)	88(48.89)	10(5.56)	3(1.67)	180

Figures given in parenthesis are percentages.

Table 5: Nutritional status of study population as per WHO standard.

Grade of nutrition	BMI Cut-off Value	Boys N=213	Girls N=180	Total N=393
Grade III	< 16	8(3.76)	10(5.56)	18(4.58)
Grade II	16-17	31(14.55)	18(10)	49(12.47)
Grade I	17-18.5	50(23.47)	51(28.33)	101(25.70)
Normal	18.5-24.99	109(51.17)	88(48.89)	197(50.13)
Overweight	25-29.99	9(4.23)	10(5.56)	19(4.83)
Obese	>30	6(2.82)	3(1.67)	9(2.29)

Figures given in parenthesis are percentages.

DISCUSSION

According to study done by Deshpande in rural areas of northern Maharashtra, prevalence of refractive errors among school going children was found to be 10.12%, in

this study prevalence was found to be 12.47%.³ Another study conducted by Abraham, in coastal south India prevalence was found to be almost 20.9%.⁴ Study from Gujarat by Thakore stated 12.8% school children were having moderate visual impairment.⁵ In above study

10.69% participants were having vitamin A deficiency which is more compared to studies by Deshpande and Thakore.^{3,5} In this study 25.7% participants found with vitamin B deficiency, which is comparable with the findings of Thakore i.e. 20.6% of Vitamin B deficiency.⁵ Among the study participants girls were having higher percentage of anemia (61.67%) compare to boys (30.99%).

According to study by Shrimali from Gandhinagar district of Gujarat 42% of school going children from boarding school were anemic out of that 37.3% were male and 46.7% were females.⁶ According to another study by Srinivasan among children of social welfare hostel of Tirupati, almost 80.4% participants were anemic, this is high compared to present study.⁷ Prevalence of dental carriers was 20.1% in this study, study by Abraham found that prevalence of dental carriers among coastal south India was 14.7%, while study by Srinivasan found 23.5% boys and 19.5% girls had dental carries.^{4,7}

CONCLUSION

Anemia is one of the leading causes of morbidity among the school going children. Apart from that, conditions related with poor personal hygiene are also present like pediculosis, scabies and worm infestations. Respiratory tract infections are common and repeated attacks of respiratory infections are present among the study participants. Vitamin deficiencies are also cause of concern among the participants. Malnutrition is prevalent and almost half of the participants were malnourished and prevalence of obesity and overweight was very less compared to the underweight. It is necessary to address all the problems among the participants as majority were from the rural background and lower socio economic strata of community.

Recommendations

It is necessary to have periodic health checkups for the students who are residing in the hostel. Management of anemia is necessary with periodic hemoglobin estimation and iron supplementations. Inclusion of the local fruits can help to reduce in vitamin deficiency and at the same time vitamin A prophylaxis can be given to the students. Mass de worming programs can be done with the help of health workers from the area. As refractive errors are one of the major causes for avoidable blindness among

children, timely corrections can improve the situations. Health education can help overcome the majority of hygiene related conditions and it is necessary to orient the students regarding various aspect of health education.

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Conflict of interest: None declared

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