International Journal of Environmental Sciences
ISSN: 2229-7359
Vol. 11 No. 16s, 2025
https://www.theaspd.com/ijes.php

A Study Of Nutritional Status In Rural School Going Children (8-16years) Using Anthropometric Measurements In Tamilnadu, India

Rishikesh[1], Umapathy Sembian[2], Muhil.M[3]

[1-]*Student 2nd year, TSRMMCH&RC,Trichy,Tamilnadu,India.*
[2-]*Professor Anatomy, TSRMMCH&RC,Trichy,Tamilnadu,India.*
[3-]*Professor Physiology, TSRMMCH&RC,Trichy,Tamilnadu,India.*

***Corressponding Author-** Umapathy Sembian.*
**Professor Anatomy, usembian@gmail.com*

INTRODUCTION:

Nutritional Status is the condition of health of an Individual Person which is dependent on nutrition intake and its utilization of the body.

Malnutrition is a public health problem and it considered to be the primary cause of ill health and pre mature mortality among children in developing countries [1].

Nutrition plays a vital role, as inadequate nutritional intake during childhood would lead to malnutrition but also affects normal growth like growth retardation, reduced work capacity; frequent illness, poor mental and social development[2].

Especially Children living in rural areas of our country suffer disproportionally from under nutrition, when compared to their urban counterparts[3].

In India alone 60 million children suffer from underweight and the prevalence is higher in rural areas when compared to urban area[4].

The amount of children with malnutrition in India is highest in the world and is twice than that of the sub-Saharan region[5].

A study conducted in the rural part of southern India, clearly indicates that 83% of ruralchildren were underweight (BMI < 18.5) and only 16 % were in the normal range and 0.39%to 0.06% belonged to overweight and obese categories.

Even though many methods for the assessment of nutritional status are available, Anthropometry is considered to be a gold standard[6].

Most commonly used indication for under nutrition is stunting (low height for age).Thinness(low BMI for age)and underweight (low weight for age). Stunting indicates prolonged under nutrition. Thinness indicates acute under nutrition and underweight is a combination of bothchronic and acute under nutrition[7.]

As there is no adequate data available on the nutritional status of rural children, we havetaken up this study to assess the prevalence of malnutrition in rural children.

REVIEW OF LITERATURE:

A survey of previous studies indicates that there is a prevalence of malnutrition in rural children throughoutIndia.

In a study conducted by in Bankura district, West Bengal,India revealed 16.9% of children were underweight [11]

In the state of Haryana a study was conducted on school children aged 7 to 9 years with a sample size of 200 (100 boys and 100 girls) in a government primary school which reveals 54.11% were stunted and 55.5% were underweight and also authors concluded that only 11% of children had BMI < 5th percentile of WHO standards which indicates that children were under nourished [12].

A study in Gulbarga, Karnataka with a sample size of 935 students in higher primary schools of Gulbarga city Showed 50.05% children were average weight for age, 22.35 % had specific deficiency diseases withBitot's spot in 48.80% children and 10.05% anemic children[13].

In Karnataka Mandya district a study has revealed in rural school going children from 6 to 12 years of age that the prevalence of underweight was 30.3% and also they concluded underweight in boys was rampant when compared to their female contemporary.[14]

A study conducted at Jhansi, India states that the nutritional status of the children in municipality schools where significantly less when compared to urban children of the same age[15].

A study done in rural Tamilnaduindicates the prevalence of underweight up to 80% in the year 2011[16].

These studies where done in recent times. Our study was mainly taken to access any improvement in the nutritional status in the present year.

Aims and Objectives:

1. To assess the nutritional status of school going childen in rural area.
2. To learn the methods of assessing nutritional status using anthropometry methodslike height weight BMI calculations etc.
3. Children who are underweight or stunted growth can be referred to a pediatricianfor further evaluation and treatment.
4. Parents can be counselled with the help of a nutritionist about the value of healthyfood habits.
5. To prevent over weight and obesity the parents to put their children in any sportsactivities.
6. To even high light the health care officials in the rural area to take necessary policiesto curtail the issue of both underweight as well as overweight and obese categories.

MATERIALS AND METHODOLOGY:

TYPE OF STUDY: cross sectional study **DURATION**: may to July 2014 **ETHICAL CONSIDERATION:**
The Project has been approved by the Institutional ethics committee.

INFORMED CONSENT:

Subjects were informed about the procedures in detail and consent form was obtained from them.

STUDY POPULATION:

Subjects of both the sexes, aged 8-16 years living in the rural area around the hospital were collected for this study

EXCLUTION CRITERIA:

All the study groups were examined by two pediatricians to rule out any health problems Pertaining to our study like major abdominal surgeries which would have led to malnutritionlike strangulated congenital hernia complicated with resection of intestine, liver disorders orother GIT related health problems.

DATA COLLECTION PROCEDURES:

Study group's profile was taken with regards to age, sex, height, weight, body massindex.

PROCEDURE:

Height and weight was measured by the investigator using standard technique[8]and compared with the standards given by the ICMR -2008. Height was measured using stadiometer to the nearest 0.1cm. Weight was measured using a calibrated weighing machine with the subjects wearing uniform calculating to the nearest 0.5kg. BMI was calculated using the formula (weight/(height in meter)^2)

- according to BMI the subjects were classified into four groups.

1. Underweight,
2. Normal weight,
3. Overweight and
4. Obese.

Malnutrition was calculated as normal, mild, moderate and severe according to Gomez classification[9].then, weight for age, Water low classification[10] for height for age.

CONFIEDENTIALITY:

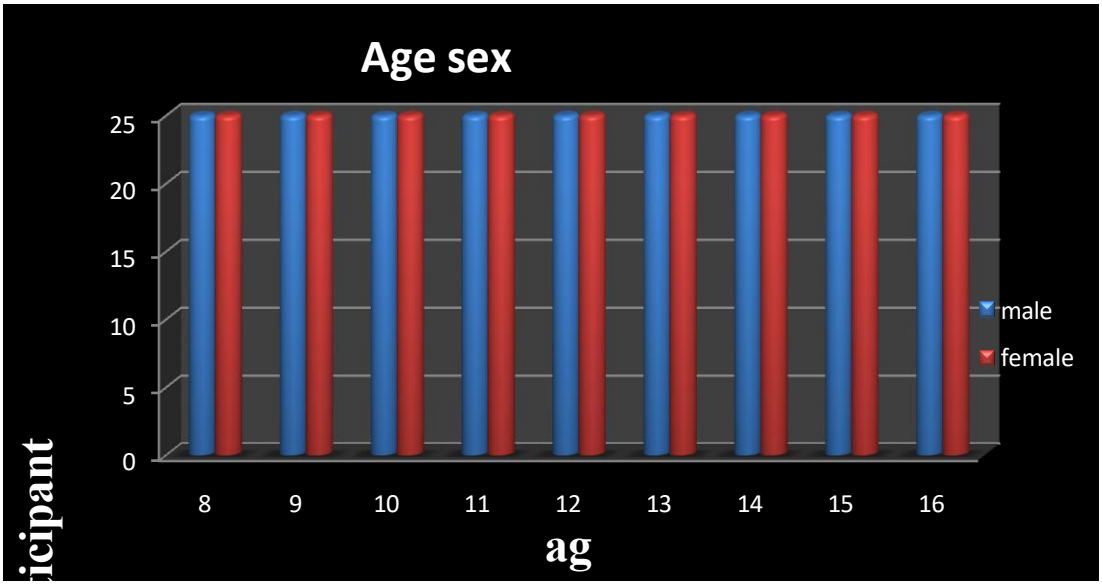
Confidentiality was maintained throughout the study.

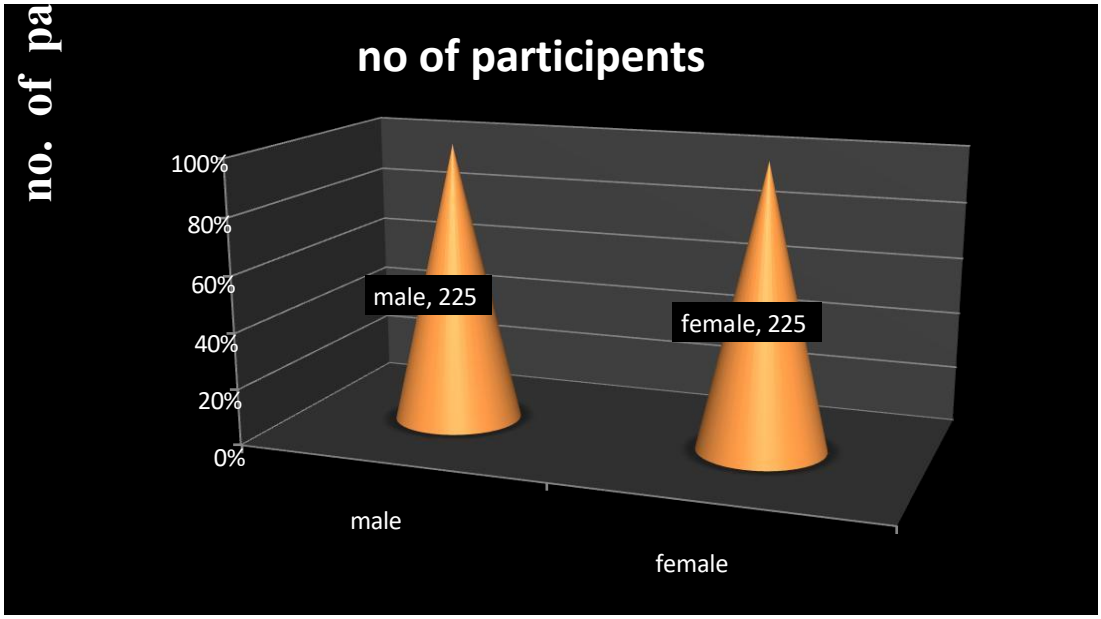
STATISTICS:

The data was entered in computer and was analyzed using spss software.

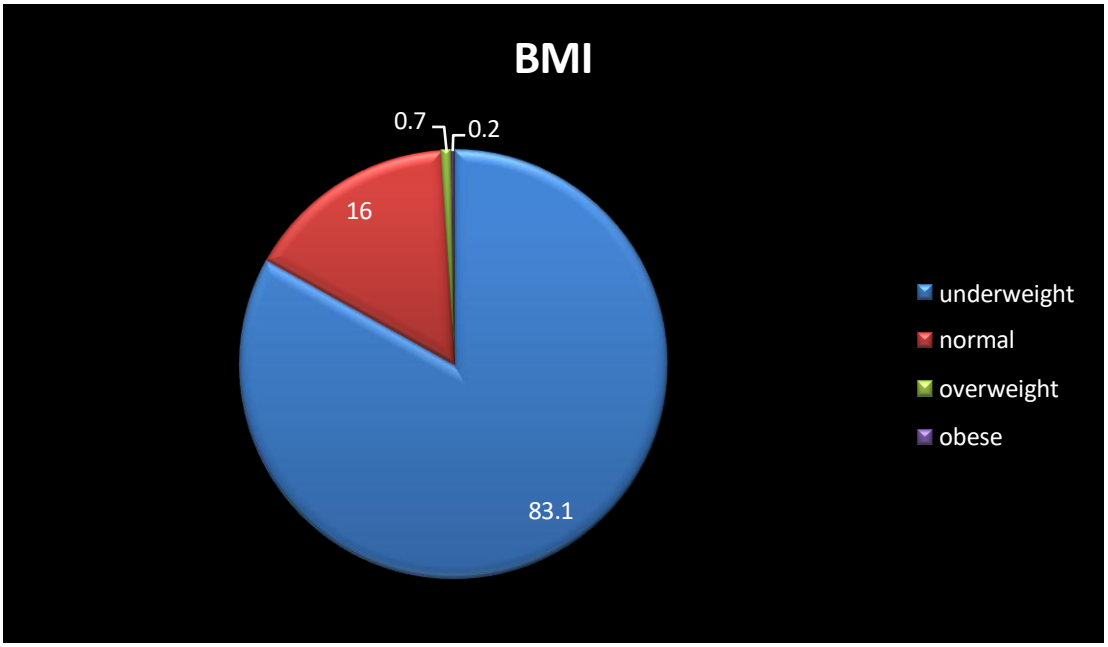
OBSERVATION AND RESULTS:

In our study which included 450 participants out of which 225 were boys and 225 were girls.





Our study has once again proved that the prevalence of underweight (height for weight ratio) out of the 450 participants 374 children where underweight constituting for 83.1% and only 72 children were of normal weight constituting for 16.0% and 0.7% were overweight and only 0.2% were obese.



WHO Classification of severity of malnutrition.

	Low(%)	Medium(%)	High(%)	Very High(%)
underweight	<10	10-19	20-29	≥30
Stunting	<20	20-29	30-39	≥40
Thinness	<5	5-9	10-14	≥15

DISCUSSION:

As it clearly said only a healthy body can accommodate a healthy mind .

WHO and other industrialized as well as developing countries has made policy decisions to improve child health and survival as their primary goals.

Especially in developing countries mal nutrition accounts for a major health problem faced by the health authorities.

In general population especially in children of school going age group this problem has amajor impact in the future as only healthy children can only become healthy adults and ultimately make a healthy society

so this problem has to be efficiently and also timely accessed and addressed by means of implementing corrective measures.

In spite of many national programs in place and also state governments invests huge amount of money for the mid-day meal scheme especially in Tamilnadu, still the prevalence of underweight Is more rampant in rural Tamilnadu especially from the conclusion derived from our observation.

But we accept that our study has its own limitations since we have not taken into account the food pattern fed to the children at home and also we consider the nutritional status of the children is directly related to the educational status

,occupation and of course socioeconomic status of the parents.

So to asses these parameters we have to take an interview with their parents and a complete diet history from their childhood has to be established. So as to provea strong correlation between the present status with the diet pattern which they follow.

CONCLUSION:

Hence we conclude that the pattern of underweight in children of rural schools of Tamilnadu is rampant.

In spite of the mid-day meal scheme implemented by the government the prevalence rate still remains the same.

We would suggest that the government authorities and also the teachers have to ensure whether the meal given

to the children are consumed by them or not.
Apart from the teachers, local doctors and NGO's should create awareness programs to the parents and public in general and also create awareness about nutritional value of different food material like pulses,cereals,meat,egg,milketc.,so as to prevent not only underweight and also vitamin and mineral deficient status.
The findings in our study will enlighten the government authorities to take effective steps to curtail this problem which will go a long way in preventing malnutrition in rural children.

SUMMARY:
In our study anthropometric measurements showed the mean height weight and BMI were significantly lower than the reference value
It was found 83.1% of children were underweight,16.0% were normal weight
,0.7% were overweight, and 0.2%were obese.
In spite of enormous growth in the financial sector and increase in individual income the scenario of child malnutrition still prevails.

STRENGTH OF THE STUDY:
Anthropometric measurements were taken for 450 students both girls and boys by a single investigator under the supervision of the guide.
To exclude observer's error in measuring height, weight and calculating BMI a randomly selected group of children were counter checked by the guide.

LIMITATIONS OF THE STUDY:
1) Children in only one geographical area have been studied
2) Varied influences like gender, pattern of food taken were not noted.
3) Parental economic status, educationalqualifications, livingenvironment, physicalactivity, sleep pattern were also not included in our study.

ACKNOWLEDGEMENT:
We first of all profusely thank ICMR for the golden opportunity given to us to do this study.
We would like to thank our institutional Pediatrician Dr.PrabhuElango Professor of Pediatrics to patiently check our study group to exclude any other congenitalanomalies, GIT related disorders.
We would like to thank our friends who helped in logistic aspects.

REFERENCE:
1. Nandy S, irvingM,GordonD,SubramanianSV,SmithGD.poverty,child undernutrition and morbidity: new evidence from India. Bull world organisation 2005;83(3):210-216
2. Awasthi CP , Kumar s, Tiwari PP, Singh AB(2000) Nutritional Status of pre- schooland school children in rural area of Sultanpet district. J Dairying Foods & Home Sci19 :16 – 21
3. Rajaraam S, Zootarali LK, Sunil TS. Individual, household Programme and Community effects on Childhood malnutrition in rural india. Matern Child Nutrition 2007; 3 (2) : 129-140
4. Smith L.C., Ruel, M.T and Ndaiye, A. (2006) Why is Child maturation lower in Urban than Rural Areas.Evidence from 36 developing Countries. World Development, 33, 1285-1305. Doi:10.1016/j.worlddev.2005.03.002
5. Gragnolatii, M., Shekar, M., Gupta, M.D., Bredenkamp, C. And Lee, Y.K. (2005)India's undernourished children: A call for reform and action. The International BankFor Reconstruction and Development/ The World Bank, Washington DC.
6. De Onis, M. and Habicht, J. P. (1996) Anthropometric reference data for international use: recommendations from a World Health Organisation Expert Committee.*The American Journal Of Clinical nutrition, 64, 650-658.* Abudaya, A.,Thoresan,M. and Abed,Y.,Holmboe-Ottesen, g. (2007) Overweight, Stunnting, andanemia are public health problems among low socioeconomic groups in school adolescents (12-15 years) in the North Gaza strip. Nutritional Research, 27, 762- 771

7. World Health Organisation. Physical Status: the Use and Interpretation of Anthropometry.Technical Report Series no. 854. Geneva: World Health Organisation, 1995.
8. Lohmaan TG, Roche AF, Martroell R. Anthropometric Standardization ReferenceManual. Chicago: Human Kinetics Books, 1988.
9. Gomez F, Galvan RR, Cravioto J, Frenk S (1955) Malnutrition in infancy and childhood, with special reference to Kwashiorkor. AdvPediatr7 : 131 -169
10. Waterlow JC (1972) Classification and Definition of protein-calorie, malnutrition.Br MedJ 3: 566-569.
11. k Bose,S Bisai, S Mukherjee. Anthropometric characteristics and nutritional status of rural school children. The internet journal of biological anthropology. 2007 volume 2 number 1.
12. WHO (2006) WHO child growth standards :Training course on child growth assessment, interpreting growth indicators. World health organization, Geneva.
13. Nigudgi SR, Boramma G, Shirinivasreddy B, Kapate R .Assessment of nutritional status of school children in Gulbarga city. Journal of pharmaceutical and bio medical sciences. 2012 ; 21:1-3.
14. N C Shivaprakash, Ranjith Baby Joseph . Nutritional Status Of Rural School- Going Children (6-12Years) Of Mandya District, Karnataka . international journal of Scientific Study. May 2014.vol 2.issue 2.
15. Ranjana Singh, M Bhatnagar, B P Mathur,Hemat Singh, Yogesh Kr. comparative study of nutritional status of primary school children in an urban area of Jhansi. Indian journal of community health .2009-2010.vol.21 no.2 , vol.22 no.1.
16. Palanisamy navaneethan, ThiagarajanKalaivani, ChandrasekaranRajasekaran, Nauthiyal Sunil .nutritional status of children in rural India: a case study from tamilnadu ,first in the world to initiate mid-day meal scheme/health 2011 vol.3 no.10,647-655