ORIGINAL RESEARCH ARTICLE
pISSN 0976 3325 | eISSN 2229 6816
Open Access Article
www.njcmindia.org
DOI: 10.5455/njcm.20190925081814

Nutritional Status of Children Aged 5-10 Years, Reporting to the Government Tertiary Hospital in Mandya

Mythily MR[1], Vinay M[2], Harish BR[3]

Financial Support: None declared
Conflict of Interest: None declared

How to cite this article:
Mythily MR, Vinay M, Harish BR. Nutritional Status of Children Aged 5-10 Years, Reporting to the Government Tertiary Hospital in Mandya. Natl J Community Med 2020;11(2):93-97

Author's Affiliation:
[1]Senior resident, Dept. of Community Medicine, Mysuru Medical College & Research Institute, Mysuru; [2]Associate Professor; [3]Professor & HoD, Dept. of Community Medicine, Mandya Institute of Medical Sciences, Mandya

Correspondence
Vinay M
doctorvinaym@gmail.com

Date of Submission: 25-09-2019
Date of Acceptance: 06-03-2020
Date of Publication: 29-02-2020

ABSTRACT

Introduction: Malnutrition is a primary cause of ill-health and mortality among children in developing countries. Mid-childhood is a dynamic period of physical growth and mental development of a child. Malnutrition in young children puts them at a higher risk of experiencing health problems such as stunted growth, increased susceptibility to infectious diseases and other morbidities.

Methodology: Cross sectional study was conducted from June to September 2018 among 636 children who reported to Out Patient Department (OPD) counter of Mandya Institute of Medical Sciences (MIMS), Mandya in the age group of 5 – 10 years during the study period. Interview was done using a pre-tested, semi-structured questionnaire.

Results: 433 (68.1%) children were normal and 203 (31.9%) were malnourished. Overweight and obesity was more common in higher socio-economic status (SES) and thinness & severe thinness was more in lower SES. Overweight and obesity was more among girls. Thinness and severe thinness was more among boys. Mothers knowledge regarding nutrition of their children and nutritive food for children was poor.

Conclusion: 32% children were malnourished. Overweight and obesity was more among girls. Mothers had poor knowledge regarding nutritive food for children.

Key words: Nutritional status, 5- 10 years, Awareness regarding nutrition

INTRODUCTION

Malnutrition continues to be a primary cause of ill-health and mortality among children in developing countries[1]. Malnutrition puts children at a higher risk of experiencing health problems such as stunted growth, mental retardation, and increased susceptibility to infectious diseases. [2] It is a major public health problem.[1]

Nutritional problems are estimated to be associated with more than one third of global child deaths. WHO, UNICEF, World Bank joint estimates for children under 5 years of age show that globally 151 million children were stunted, 51 million children suffer from wasting and 99 million children were underweight in 2017. Regional disparities of nutritional status are high. [3] In India, 7.5% were severely wasted, 21% wasted, 2.1% overweight, 38.4% stunted and 35.7% underweight as per the UNICEF, World Bank joint report 2017. The high levels of under-nutrition in children in South Asia pose a major challenge for child survival and development.[2] The data with respect to nutritional status of children aged 5- 10 years are sparse.

The nutritional status of an individual is the result of many interrelated factors. Good nutrition is a

basic requirement for good health. It is influenced by the adequacy of food intake both in terms of quantity and quality and also physical health of the individual.[4]

Mid-childhood is also a dynamic period of physical growth and mental development of a child. It is the transition between under five age group and adolescence. [5] Eating patterns are established during this period. Majority of the children start their formal schooling in this age group. In under five age group children, regular monitoring of nutritional status is done using growth chart. If the children are missed, they would be covered when they visit health care facility for vaccination. The vaccination schedule in the government run immunization program in majority of the countries would be completed by 6 years of age and thus children are seldom brought to health care facility until they are sick. Thus no regular monitoring of nutritional status is done. 5- 10 years age group is also an important age group during which the nutritional monitoring should be continued as malnutrition in this age group will be carried over for the next stage i.e., adolescence.

There are a number of studies and global surveys conducted regarding nutritional status of children in the age group of less than 5 years and also adolescent age group (10 – 19 years) as it influences nutritional status of adulthood and pubertal growth and development will be affected. But very few studies have been done in the age group of 5-10 years, which is an important period of childhood. Thus the present was conducted to determine the nutritional status of children in the age group of 5 - 10 years reporting to the government tertiary care hospital in Mandya and to assess awareness among their parents about nutritional status of children.

METHODOLOGY

It was a cross sectional study conducted between June 2018 to September 2018. The study population were children aged 5-10 years who reported to Out Patient Department (OPD) registration counter of Mandya Institute of Medical Sciences (MIMS), Mandya during the study period. The sample size was 636, calculated using formula $4pq/d^2$ where 'p' is 38.6%. [6] The selection of children was based on convenience sampling. Parents who consent and children aged 5 – 10 years who assent to participate in the study were included. Children with severe illness were excluded from the study. Data was collected by the researchers by interview method using semi-structured, pre-tested questionnaire. The questionnaire had three parts. In the first part sociodemographic details were collected. In the second part anthropometric measurements were taken. In the third part questions regarding parents perception about their child's nutritional status and their awareness regarding nutrition were collected. Data was entered in Microsoft excel software and analysed using Epi Info software. Ethical clearance was obtained from Institutional Ethics Committee of MIMS, Mandya.

Table 1: Classification of BMI according to WHO 2017 reference[7]

WHO classification	Nutritional status
<Median–3SD	Severe thinness
Median<-2SDto>-3SD	Thinness
≥Median-2SDto<+1SD	Normal
Median≥+1SDto<3SD	Overweight
≥+3SD	Obesity

Fig 1: BMI chart for girls aged 5- 10 years

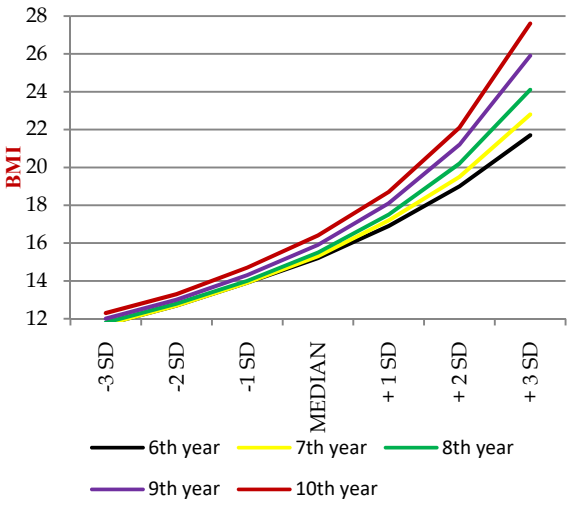
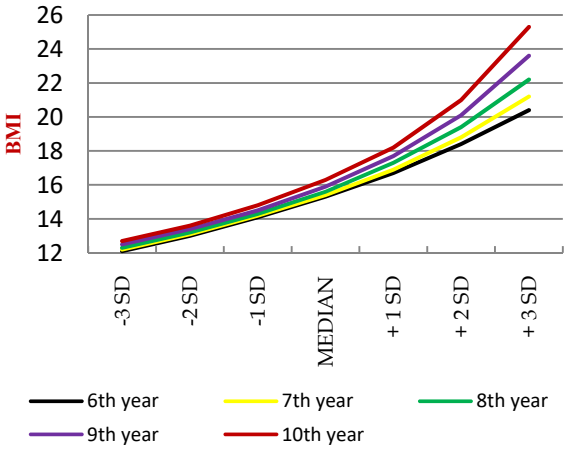


Fig 2: BMI chart for boys aged 5- 10 years



Assessment of nutritional status was done using Body Mass Index (BMI) classification for age-WHO reference 2007 for 5 -19 years age group [7] based on Z scores for BMI given by Indian Council

of Medical Research (ICMR) for different age groups for boys and girls. [8]A reference chart of BMI for 5- 10 years old girls and boys has been depicted (Refer fig 1 and fig 2)

RESULTS

Of the total 636 study subjects 168 (26.4%) were in 10th year and 129 (20.3%) were in 6th year. 326 (51.3%) were females and 310 (48.7%) were males. 374 (58.8%) were from rural areas. 292 (45.9%) belonged to class IV SES and 246 (38.7%) to class III SES. 251 (39.4%) of the mothers had completed high school and 169 (26.6%) had completed primary school.

Of the 636 study subjects, 433 (68.1%) children were normal and 203 (31.9%) were malnourished. Among 203 malnourished children, 101 (15.9%) were having thinness, 59 (9.3%) had severe thinness, 41 (6.4%) were overweight and 2 (0.3%) were obese.

From the table 2 it is observed that among those in 6th year, 22 (17.1%) were thin and 5 (3.9%) were overweight. In the 7th year, 13 (13.5%) were thin and 5 (5.2%) overweight. In 8th year, 25 (21.7%) were thin and 4 (3.5%) were overweight. In 9th year 17 (13.3%) were thin and 11 (8.6%) were overweight. In 10th year, 24 (14.3%) were thin and 18 (10.7%) were obese. The difference between age groups with respect to nutritional status was statistically significant. 58 (18.7%) boys had severe thinness and 19 (6.1%) were overweight. 43 (13.2%) girls were thin and 24 (7.3%) were overweight and obese (2 of the girls were obese). Thinness was more among boys and overweight and obesity more among girls. The difference was statistically significant. Thinness was seen in 51 (19.1%) among those residing in rural area and 50 (13.6%) among those in urban area. The difference was statistically significant.

Severe thinness was more in those of lower SES, 17 (6.9%) in class III, 35 (12.0%) in class IV and 7 (14.9%) in class V. Overweight and obesity more common among higher socioeconomic status, 5 (12.5%) in class II. The difference was statistically significant.

Table 2: Socio- demographic factors and its association with nutritional status

Variables	Severe thinness	Thinness	Normal	Overweight & obesity	Total	P value
Age						
6th year	13 (10.1)	22 (17.1)	89 (69.0)	5 (3.9)	129	0.021
7th year	6 (6.3)	13 (13.5)	72 (75.0)	5* (5.2)	96	
8th year	9 (7.8)	25 (21.7)	77 (67.0)	4 (3.5)	115	
9th year	15 (11.7)	17 (13.3)	85 (66.4)	11 (8.6)	128	
10th year	16 (9.5)	24 (14.3)	110 (65.5)	18 (10.7)	168	
Sex						
Male	36 (11.6)	58 (18.7)	197 (63.5)	19 (6.1)	310	0.036
Female	23 (7.1)	43 (13.2)	236 (72.4)	24* (7.3)	326	
Residence						
Rural	26 (12.6)	51 (19.1)	272 (61.5)	25 (6.9)	374	0.007
Urban	33 (7.0)	50 (13.6)	161 (72.7)	18* (6.7)	262	
Socio Economic Status						
Class I	0 (0.0)	2 (18.2)	9 (81.8)	0 (0.0)	11	< 0.05
Class II	0 (0.0)	8 (20.0)	27 (67.5)	5* (12.5)	40	
Class III	17 (6.9)	43 (17.5)	161 (65.4)	25 (10.2)	246	
Class IV	35 (12.0)	44 (15.1)	200 (68.5)	13 (4.5)	292	
Class V	7 (14.9)	4 (8.5)	36 (76.6)	0 (0.0)	47	
Mothers education						
Illiterate	12 (12.8)	20 (21.3)	62 (66.0)	0 (0.0)	94	0.002
Primary school	14 (8.3)	24 (14.2)	125 (74.0)	6 (3.6)	169	
High school	24 (9.6)	41 (16.3)	167 (66.5)	19 (1.6)	251	
Degree	9 (7.4)	16 (13.1)	79 (64.8)	18* (14.7)	122	
Mid day meals						
Yes	25 (8.2)	44 (14.4)	220 (71.9)	17 (5.6)	306	0.378
No	34 (10.3)	57 (17.3)	213 (64.5)	26* (7.9)	330	
Dewormed in past 6 months						
Yes	37 (8.6)	68 (15.8)	301 (69.8)	25 (2.8)	431	0.173
No	22 (10.7)	33 (16.1)	132 (64.4)	18* (8.8)	205	
Birth order						
1	27 (7.9)	47 (13.7)	212 (70.8)	26 (7.6)	342	0.540
2	26 (10.7)	42 (17.2)	162 (66.4)	14 (5.7)	244	
> 2	6 (12.0)	12 (24.0)	29 (58.0)	3 (6.0)	50	

* Two obese female children

Table 3: Parents knowledge about their child's nutritional status

Nutritional status	Under-nourished	Normal	Over nourished
Correct knowledge	104 (65.0)	291(67.2)	7(16.3)
Wrong knowledge	56 (35.0)	142(32.8)	36(83.7)
Total	160	433	43

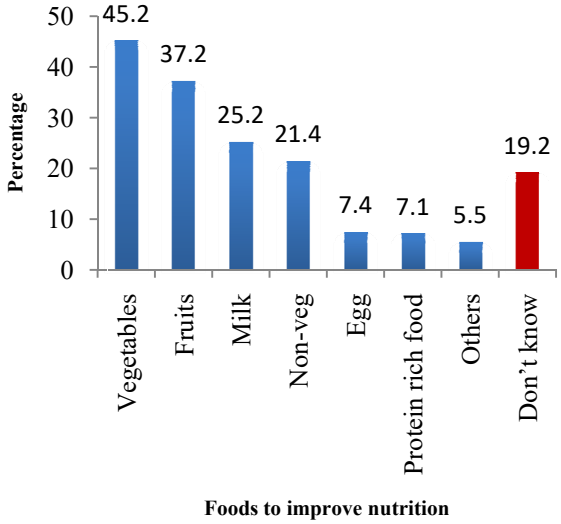


Fig 3: Mothers knowledge regarding foods that improve nutrition of children

Among those mothers who were illiterate, 12 (12.8%) children had severe thinness and 20(21.3%) had thinness. Among those who had studied up to degree, children who were overweight and obesity18(14.7%) were more compared to severe thinness 9 (7.4%) and thinness 16 (13.1%). The difference was statistically significant.

Among those taking mid-day meals in school, 68 (15.8%) had thinness and 25 (2.8%) had overweight. Among those not taking mid-day meals, 33 (16.1%) had thinness and 18 (8.8%) had overweight(two were obese). The difference was not statistically significant.

Thinness, 12 (24.0%) was more with birth order >2 and overweight 26 (7.6%) was more in birth order 1. The difference was not statistically significant.

Among 160 parents of undernourished children, 104 (65.0%) had correct knowledge that their children were undernourished and 56 (35.0%) parents had wrong knowledge that their children were undernourished.

Among 43 parents of over nourished children, 7 (16.3%) had correct knowledge and 36 (83.7%) had wrong knowledge that their children are over nourished. (Refer table 3).

Majority of the parents i.e., 288 (45.2%) thought giving vegetables improves nutrition of children, 237 (37.2%) giving fruits and 35 (5.5%) thought giving other foods like sweets and junk food improves the nutrition of their children. 122 (19.2%) did not know about foods which improves nutrition of their children.

Among the parents of 636 children, 601 (94.5%) felt there is need for nutrition education and 35 (5.5%) felt there is no need for nutrition education for them. (Refer fig 3).

DISCUSSION

Malnutrition continues to be a primary cause of ill-health and mortality among children in developing countries. The impact of malnutrition is diverse. It has an impact on the physical well-being and socio-economic condition of a nation. The number of studies done in this particular age group with respect to nutritional status globally and in Indian population are few, as most of the studies concentrate on the age group of < 5 years or adolescents > 10 years.

The findings of this study showed that 26% of the study population were in 10th year. There was almost equal representation of males and females. Around 58% were from rural area. 46% belonged to class IV SES. In our study 68% children were normal and 32% were malnourished. The results of our study are similar to that by Ramachandra and others [1] in which 67% of children were normal and 33% had some malnutrition and study done in Srilanka by Nautunna et al., which showed 65% were normal and 35% had some malnutrition. [6] Our results were better compared to study by Nora Zaberio [9] and others, in which 58% children were normal and 42% had some malnutrition. This could be due to different geographical area. In our study 9% had severe thinness, 16% were having thinness, 6% were overweight and 0.3% were obese. In a study by Ramesh Masthi NR et al., 9.1% were found to have severe thinness, 20.9% thinness, 4.4% overweight and 1.4% obesity. [10] In Nautunna study, severe thinness was 7.5%, thinness 21.2%, overweight 3% and obesity 2.5%.[6] In a study by Moumita Das et al., in West-Bengal 38.7% were underweight.[5] In Ramachandra K et al., study severe thinness 3.1%, thinness was 13%, overweight 8% and obese were 9%.[1] In Nora Zabeiro et al., study 26.3% were overweight and 15.1% were obese.[9] Mario V study, 29% underweight and 9% overweight.[11] The findings of our study are similar to some and different from some of the studies, the reason for lower prevalence of overweight and obesity being that our study area is not a metro city and majority of people are form rural area and of poor SES. Thus children with severe thinness and thinness are more. The determinants of malnutrition assessed in our study showed the results as follows. Thinness was more in rural areas and was

more in lower socioeconomic status. Overweight and obesity was more common in higher socio-economic status and thinness and severe thinness was more in lower socio economic status. Overweight and obesity was more among girls. Thinness and severe thinness was more among boys. Various studies have shown that mothers knowledge regarding nutrition is directly proportional to the nutritional status of their children.[12, 13] Mothers knowledge regarding nutrition of their children and malnutrition was poor in our study. In Ansuya et al., study 65% of mothers were having average knowledge about malnutrition.[14] In Mishra et al., study 40% of mothers had poor knowledge and 33% had average knowledge. [15]

CONCLUSION

68% children were normal and 32% were malnourished. Overweight and obesity was more common in higher SES and thinness & severe thinness was more in lower SES. Overweight and obesity was more among girls. Thinness and severe thinness was more among boys. Mothers knowledge regarding nutrition of their children and nutritive food for children was poor.

RECOMMENDATIONS

Steps should be taken to monitor nutritional status in the age group of 5- 10 years on a regular basis other than during visit to health facility during illness. Awareness should be given to parents regarding nutritional status of their children and regarding foods to improve nutrition of their children which is culturally and socially acceptable.

Acknowledgement: We acknowledge contribution of Staff of Department of Community Medicine, MIMS, Mandya and the study participants.

REFERENCES

1. Ramachandra Kamath, Ravi Prasad Jakkula, Saurabh Kumar. Nutritional status assessment of school children in Bellary district, Karnataka. Journal of Dr. NTR University of Health Sciences [internet]. Jan 2015 [cited 2018 Aug 21]; 4(1): 13- 16. Available from: http://www.jdrntruhs.org/ downloadpdf.asp?issn=2277-8632;year=2015;volume=4;issue=1; spage=13;epage=16;aulast=Kamath;type=2
2. World Health Organization. Geneva [Internet]. Malnutrition 2017, [cited 2018 Aug 22]. Available from: http:// www.who.int/maternal_child_adolescent/topics/child/malnutrition/en/
3. World Health Organization. Geneva [Internet]. Joint child malnutrition estimates - Levels and trends (2018 edition) UNICEF-WHO-The World Bank Group, [cited 2019Jan 4]. Available from: https://www.who.int/ nutgrowthdb/ estimates2017/en/
4. Park K. Park's Textbook of Preventive and Social Medicine. 24th ed, Jabalpur: M/s Banarasidas Bhanot publishers; 2016; Page no: 662
5. Moumita Das, Gopal Chandra Mandal and Subha Ray. Prevalence Of Undernutrition Among Children Aged 5-10 Years Of North-24 Parganas District, West Bengal, India. Journal Ind. J. Phys. Anthrop. & Hum. Genet [internet]. 2014 [cited 2018 Aug 21]; 33(1): 91- 97. Available from: http://www.scielo.org.ar/pdf/aap/v111n2/v111n2a02.pdf
6. N. P. G. C. R. Naotunna, M. Dayarathna, H. Maheshi, G. S. Amarasinghe, V. S. Kithmini, M. Rathnayaka et al.,. Nutritional status among primary school children in rural Sri Lanka; a public health challenge for a country with high child health standards. BMC Public Health [internet]. Jan 2017 [cited 2019Jan 18]; 17(5). Available from: http https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5223320/
7. World Health Organization. Geneva [Internet]. BMI-for-age (5-19 years) 2017, [cited 2019 Feb 12]. Available from: https: //www.who.int/growthref/who2007_bmi_for_age/en/
8. Indian Council of Medical Research [Internet]. New Delhi, ICMR bulletin 2017. [cited 2018 Aug 22]. Available from: http://icmr.nic.in/bulletin/english/January-December% 202015.pdf
9. Zeberio N, Malpeli A, Apezteguía M, Carballo MA, González HF. Nutritional status of school-aged children and its relation to blood pressure. Arch Argent Pediatr [Internet]. April 2013 [cited 2019 Jan 6];111(2):92-7.Available from: https://www.ncbi.nlm.nih.gov/pubmed/23568063
10. Ramesh Masthi NR, Madhusudan M, Gangaboraiah. Nutritional status of school age children (6-15 years) using the new WHO growth reference in a rural area of Bengaluru, South India. National Journal of Research in Community Medicine. Vol.6. Issue 2. Apr.-Jun.-2017(144-150) ISSN - Print: 2277 – 1522, Online: 2277 – 3517
11. Mario V. Capanzana, Divorah V. Aguila, Glen Melvin P. Gironella, and Kristine V. Montecillo. Nutritional status of children ages 0–5 and 5–10 years old in households headed by fisherfolks in the Philippines. Arch Public Health [Internet]. 2018 [cited 2018 September 15]; 76: 24. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5901871
12. Mahama Saaka. Relationship between Mothers' Nutritional Knowledge in Childcare Practices and the Growth of Children Living in Impoverished Rural Communities.J Health Popul Nutr. 2014 Jun; 32(2): 237–248. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4216960
13. Samuel Nambile Cumber, Nkengateh Babara Ankraleh, Nina Monju. Mothers' Knowledge on the Effects of Malnutrition in Children 0-5 Years in Muea Health Area Cameroon. Journal of Family Medicine and Health Care. Volume 2, Issue 4, December 2016, Pages: 36-42. Available from: http://article.sciencepublishinggroup.com/html/ 10.11648.j.jfmhc.20160204.13.html
14. Ansuya, Nayak, B. S., Unnikrishnan, B., George, A., Shashidhara, Y. N., & Mundkur, S. C. (2018). Mothers knowledge on malnutrition: Community based cross sectional study. Indian Journal of Public Health Research and Development, 9(1), 37-41. https://doi.org/10.5958/0976-5506.2018.00007.4
15. Mishra, Alka; Bhardwaj, Urmila D; Rani, Seema. Knowledge regarding Malnutrition and Its Prevention – A Study on Slum Dwelling Mothers. International Journal of Nursing & Midwifery Research (ISSN: 2455-9318), [S.l.], v. 4, n. 2, p. 32-37, sep. 2017. ISSN 2455-9318. Available at: <https:// medical.adrpublications.in/index.php/IntlJ-Nursing andMidwifery Res/article/view/1165>.