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International Journal of Current Research
Vol. 7, Issue, 02, pp.12500-12502, February, 2015

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

RESEARCH ARTICLE

NUTRITIONAL STATUS OF SCHOOL AGE CHILDREN (5-14 YEARS) IN A RURAL HEALTH BLOCK

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ARTICLE INFO

Article History:
Received 20th December, 2014
Received in revised form
16th January, 2015
Accepted 25th January, 2015
Published online 26th February, 2015

Key words:

School age Children,
Underweight,
Stunting,
Wasting,
Thinness

ABSTRACT

Objective: To assess the nutritional status of school going children in Rural health block.
Methods: School children from various primary and middle level educational facilities from a rural health block were surveyed during the School Health Program. Height and weight was measured following standard procedures. MS Excel and Interactive statistics page were used for analysis of data.
Results: Both mean weight and height were higher in females than males. The overall prevalence of under nutrition was 19.2%. The prevalence of underweight was lowest in 5 year female (0.0%) and highest in 6 year male (21.5%). For Stunting 7 year males recorded the lowest (0.0%) and 12 year males the highest (28.5%) prevalence. The highest and lowest prevalence of wasting was recorded in 6 year old females (2.56%) and 9 year old males (24.6%) respectively. Prevalence of thinness was lowest in 13 year old females (14.2%) and highest in 13 year old males (47.1%).
Conclusion: The nutritional status of school age children in this health block are comparatively better even though a large number of children still fall below the cutoff for various nutritional indicators.

INTRODUCTION

The most important nutritional problem in the world today is the protein energy malnutrition (**Geneva, 1983**). The problem is more severe in third world countries affecting children of all ages especially the under fives. Nutritional deprivation is rampant in children of school age particularly primary school children ranging in magnitude from 20-80%.Since deficient physical growth is naturally reflected in their suboptimal mental achievement (**Horrocio *et al*., 2007**). The assessment of nutritional status of segment of population is essential for making progress towards improving overall health of the school age children. NFHS-3 conducted recently has not reported on nutritional status of children in school age group. A number of studies have been conducted to assess the nutritional status of children in which different classifications like IAP, Gomez, waterloo's etc have been used; the most commonly used being the IAP classification. Since different cutoff values for normality have been used in different systems therefore these cannot be used universally. To overcome this problem World Health Organization has recently recommended the use of z-score system for classifying malnutrition in children (**Geneva, 2007**). In the present study an attempt has been made to assess the nutritional status of school children using the Z-score system.

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The area in which the present study was conducted is the rural block attached to the department of Community Medicine. It is situated at a distance of 25 Kms from the college and has a population of .79 lacks. No reliable estimates of nutritional status are available from the mentioned area. The present work describes the findings of the survey being conducted as part of the School Health Program run by the department.

MATERIALS AND METHODS

The present study was conducted in the Rural Health Block attached to the department of Community Medicine. The school health program is being carried out on regular basis in the Rural Block. For the purpose of the present paper, the survey findings from schools surveyed from May 2014. November 2014 has been included. The age of the children was determined using school records. In the schools nutritional status of children was assessed as follows:

Weight: Measured using a floor type weighing scale with due respect to the standardization of the equipment and procedure. The measurements were taken to the nearest. 5Kg.

Height: was taken using a stadiometer. The measurements were taken with children barefoot with their back of heels, buttocks and head touching the wall. Readings were taken to the nearest .5cm.

WHO z- score system was used to classify the nutritional status of children.

RESULTS

A total of 940 children in the age group of 5-14 have been included in the study. The mean height and weight of girls was found to be higher than boys in all age groups.

Table 1. Anthropometric indices and cutoff points

Indicator	5-9 years	
Anthropometric variable	Cutoff point	
Stunting	Height for Age	<-2SD
Wasting	*Weight For Height	<-2SD
Underweight	Weight for Age	<-2SD
	10-14 Years	
Stunting	Height for Age	<-2SD
Thinness	*BMI for Age	< 5th Percentile

*In children 5-9 years age weight for height (W/H) was used and in children 10-14 years BMI for age was used (WHO, 1983).

Table 2. Mean and Standard deviation of Height and Weight of study participants

Age(Y)	Sex	No.	Wt (mean ±SD)	Ht (mean ±SD)
5	M	32	18.35(2.92)	109.78(21.06)
	F	46	18.05(3.79)	111.14(9.94)
6	M	51	18.72(3.33)	115.4(8.42)
	F	39	20.15(3.37)	117.29(8.40)
7	M	28	23.36(4.89)	125.10(7.24)
	F	38	23.08(5.13)	127.18(8.37)
8	M	44	23.18(3.61)	127.76(9.30)
	F	36	23.06(3.71)	128.04(9.43)
9	M	65	25.33(4.33)	134.25(9.24)
	F	59	27.03(5.97)	136.75(8.88)
10	M	47	28.12(5.25)	135.00(10.21)
	F	41	30.17(6.50)	141.07(10.82)
11	M	59	30.17(5.72)	139.94(9.23)
	F	40	32.25(8.03)	143.53(12.58)
12	M	49	31.48(5.32)	138.98(15.36)
	F	70	34.85(7.82)	146.11(10.46)
13	M	59	34.93(6.66)	150.04(10.56)
	F	76	40.11(6.60)	152.55(9.26)
14	M	33	39.46(9.89)	153.96(13.26)
	F	28	41.38(7.14)	157.27(6.50)

The overall prevalence of under nutrition was 19.2%. We observed a prevalence of 11.1%, 9.25% 12.3% and 29% for underweight, stunting, wasting and thinness respectively. The prevalence of severe underweight, stunting and wasting was 2.05%, 2.65% and 2.05% respectively.

Table 3. Prevalence of under nutrition in School age children in a rural health Block

Indicator	Males	Females	Total
Underweight	41(18.6)	8(3.66)	49(11.1)
Stunting	55(11.7)	32(6.76)	87(9.25)
Wasting	36(16.3)	18(8.18)	54(12.3)
Thinness	79(31.9)	67(26.2)	146(29.0)

In all the age groups more males were found to be underweight than females (p<.01). In seven out of nine age groups the proportion of stunted children was higher among males (p<01). The same trend was observed for wasting also (p<01). For the indicator thinness the prevalence was higher in females in lower age group and vice versa (p>.05).

Table 4. Prevalence of underweight stunting and wasting in children aged 5- 9 Years

	Underweight				
Gender	5 years	6 years	7 years	8 years	9 years
M	1(3.12)	11(21.5)	3(10.7)	8(18.1)	9(13.8)
F	0(0.0)	2(5.12)	3(7.89)	2(5.55)	1(1.69)
Total	1(3.12)	13(14.4)	6(9.09)	10(12.5)	10(8.06)
	Stunting				
M	1(3.12)	5(9.80)	0(0.0)	6(13.6)	1(1.53)
F	1(2.17)	3(7.69)	1(2.63)	3(8.33)	2(3.38)
Total	2(2.56)	8(8.88)	1(2.63)	9(11.2)	3(2.41)
	Wasting				
M	1(3.12)	5(9.80)	5(17.8)	9(20.4)	16(24.6)
F	2(4.34)	1(2.56)	3(7.89)	4(11.1)	8(13.5)
Total	3(3.84)	6(6.66)	8(12.1)	13(16.2)	24(19.3)

Table 5. Prevalence of Stunting and thinness in children aged 10-14 years

	Stunting				
Gender	10 years	11 years	12 years	13 years	14 years
M	6(12.7)	8(13.5)	14(28.5)	6(10.1)	8(24.2)
F	3(7.31)	6(15.0)	7(10.0)	5(6.57)	2(7.14)
Total	9(10.2)	14(14.1)	21(17.6)	11(8.08)	10(16.3)
	Thinness				
M	9(19.0)	15(25.9)	14(28.3)	28(47.1)	13(38.4)
F	16(39.0)	13(33.3)	17(23.9)	11(14.0)	10(36.3)
Total	25(28.4)	28(28.2)	31(26.0)	39(28.6)	23(37.7)

DISCUSSION

Among various problems encountered in school age children, malnutrition accounts for the majority. It is wisely said that only a healthy body can harbor a healthy mind. It is imperative that these disorders in children are efficiently and timely assessed and corrective measures employed accordingly. Assessment of nutritional status in school children is one such endeavor. In the present survey we observed a comparatively lower prevalence of under nutrition (11.1%, 9.25% and 12.3% for underweight, stunting and wasting respectively) than that reported by G K **Mendhi *et al.* (2006)** from Assam in 6-8 year old children wasting 21.1%, stunting 47.4% and underweight 51.7%. Bandopadyay (1988) from Navinagar Mumbai reported prevalence for wasting 17.0%, stunting 16.8%, and underweight 42.3%. **Mitra *et al.* (2007)** from Chhattisgarh reported prevalence of underweight 90.0% and stunting 47.5%. Similarly **Chowdhary *et al.* (2008)** from Puriliya West Bengal also reported figures of underweight 33.7%, wasting 29.4% and stunting 17.0%.

The proportion of severely underweight, stunted and wasted children in our study was 2.05%, 2.65% and 2.05% compared to higher figures of 7.92%, 4.98% and 9.51% reported by **Chowdhary *et al.* (2008)** from West Bengal. The most probable reason for better results in our study could be a better socioeconomic status of people as the proportion of people living below poverty line is less in J&K compared to much higher figures from other states. Also NFHS-3 while reporting findings on under nutrition in preschool children reported a prevalence of 29.4%, 27.6% and 15.4% for underweight, stunting and wasting respectively (nfhsindia.org/india2.html)

thus a reduction of 32.5%, 33.1% and 8.87% in these indicators over that reported by NFHS-2 and these improvements in nutritional status are likely to be reflected in older children. The prevalence of underweight and stunting did not show a definite trend across various age groups, similar observation has been reported by **Mendhi *et al.* (2006).** Though prevalence of wasting was observed to increase from lower to higher age .We found a higher prevalence of underweight (18.6%, 3.66), stunting (11.7%, 6.76%) and wasting (16.3%, 8.18%) in males than females. Similar trend has been reported by **Mukherji *et al.* (2008)** from Pune (p>.05). WHO recommends that in older children (>10 years) BMI for age should be used instead of weight for height to avoid errors in assessment due to changes of puberty **Mendhi *et al.* (2006)**. The overall prevalence of thinness was 29.0% with 31.9% males and 26.2% females falling below the cutoff, the difference being statistically insignificant. The figures are better than those reported by **Mendhi *et al.* (2006)**, males 51.8% and females 56.8%. We observed that in younger age group (10 & 11 year olds) a higher proportion of males was found to be thin while as in older group more females were thin. Only in 10 year and 13 year old children was the difference statistically significant. These observations seem to be due chance only. This could be either due to a smaller number of children included or the age of the some of the children could not have been ascertained accurately in spite the best efforts.

Our observations reveal that even though the situation in our setup is comparatively better, still a large number of children are malnourished in spite of the positive inputs indicators like lower proportion of BPL, implementation of nutrition programs in schools etc. During our survey we observed that the Mid Day Meal Programmed is being implemented halfheartedly with least consideration being given to guidelines from the concerned ministry. The selection of children, food quality, food quantity and continuous supply remain major issue in the program. On short term basis measures like proper selection of children, continuous nutrition education in schools for encouraging judicious use of locally available foods, supervision of mid day meals to children at schools and uninterrupted supply of cooking material would go a long way to improve their nutritional status. On long term basis ensuring nutritional monitoring of school children as part of school health program, improvement in school environment, improving the purchasing power of people, making foods available at affordable prices especially for weaker sections can be instrumental in bringing a much needed improvement.

Contribution by each Author

IMP and SNA collected the data from schools and carried out tabulation, analysis of data and also wrote the manuscript. SNA and SMK helped in tabulation and analysis. IH helped in proof reading.

Conflict of interest: None Declared

Source of funding: None.

Acknowledgements

We are extremely grateful to the officers of the education department and teachers of the surveyed schools for their cooperation during conduct of the survey.

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