

Original Research Article

A cross sectional study to assess the nutritional status of under five children in block Hajin of Kashmir valley

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ABSTRACT

Background: Nutrition can be defined as the science that studies food and how food nourishes our body and influences our health. Proper nutrition can help us improve our health, prevent certain diseases, achieve and maintain a desirable weight and maintain our energy and vitality. Malnutrition is a broad term commonly used as an alternative to under nutrition (wasting, stunting and underweight) but technically it also refers to over nutrition (overweight and obesity). Nutrition is particularly important in early childhood when growth is most rapid. Assessment of nutritional status of under-5 children in block Hajin and to identify the factors associated with malnutrition in these under-fives.

Methods: This is a community based cross sectional study, conducted in health block Hajin on a random sample of 403 under five children using multistage sampling technique based on probability proportionate to size (PPS).

Results: depicts that most of the children belonged to age group 25-60 months (45.9%), there was female preponderance (54.1%) among the study subjects. Most of the study subjects were having birth order first (40.9%). Majority of the study population were having birth interval between 2 to 3 years (40.8%).

Conclusions: From the study it is concluded that prevalence of different forms of malnutrition was comparatively lower as compared to national data. Malnutrition was more in infants, female gender, under-fives belonging to nuclear families, having illiterate mothers and those belonging to lower socioeconomic status.

Keywords: Assessment, Nutrition, Under five children

INTRODUCTION

The term 'nutrition' is derived from a Latin word 'nutrire'¹ meaning to suckle/feed and some researchers have said that it is derived from Latin word 'nutritic' which means nourishment. Proper nutrition can help us improve our health, prevent certain diseases, achieve and maintain a desirable weight and maintain our energy and vitality. Nutrition is particularly important in early childhood when growth is most rapid. Therefore, children below 5 years of age are most susceptible to malnutrition. Nutritional status of a child may fall anywhere along a

continuum from healthy to imbalanced and this imbalance includes both inadequate and excessive energy intake which in turn leads to malnutrition. Growth can be determined by measuring the body weight and height. A child at a particular age must have a specific height and weight. In other words, the body weight and height of the child can become the indicator of his/her nutritional status. Dietary intake is the second method of assessment of nutritional status of a child. Nutritional status of a child can also be assessed on the basis of clinical signs and symptoms of various nutritional deficiency diseases. The presence of one or more deficiencies will mean poor

nutritional status. Child suffering from protein energy malnutrition is shorter and thinner as compared to the other children of same age.² Sixth report on global nutrition showed that the extent of malnutrition is still high and progress to reduce it in most regions of the world is slow.³ Globally 151 million, 51 million and 16 million under-five year olds were estimated to be stunted, wasted and severely wasted respectively and 38 million under-five year olds were overweight in 2017.⁴ As per NFHS-4 (2015-16), in India 38.4% under-five children were stunted, 21.0% were wasted and 35.7% were underweight. The change in nutritional status across India's states however has been highly variable e.g. in the state of Jammu and Kashmir the situation has not undergone significant change over the years, with the current prevalence of stunting, wasting and underweight as 31.7%, 7.1% and 15.6% respectively and as per NFHS-4 (2015-2016) prevalence of stunting was 23.3%, wasting was 18.9% and underweight was 21.6%.^{5,6} The problem of under nutrition is now supplemented by the challenge of a growing population of over weight and obese children which has been reported to be 4.3% and 15.3% respectively.⁷ The present study was done in order to assess the magnitude of malnutrition and factors contributing to the same in the under-five population in health block Hajin, the rural field practice area of the department of community medicine, so that necessary remedial measures are taken to address this problem.

Aims and objectives

Aim and objectives were assessment of nutritional status of under-five children in block Hajin and to identify the factors associated with the malnutrition in these under-fives.

METHODS

Study area

Study conducted at Block Hajin, the field practice area of department of community medicine-SKIMS situated about 30 kilometers from Srinagar city.

Study design

This study was a cross sectional and community-based study.

Study period

Study was conducted over a period of one year from June 2017 to June 2018.

Study population

All the children under five years age and whose mothers consented and were permanent residents of the health block were participants of the study.

Inclusion criteria

Under five children whose parents/ guardians gave consent to be the part of study were included.

Exclusion criteria

Under 5 children whose parents/guardians did not consent to be the part of study were excluded. Children with documented congenital, developmental abnormalities, mental retardation or metabolic syndrome were excluded.

Sampling technique

Multistage random sampling technique. Assuming an overall prevalence of underweight (weight for age < median $\pm$ 2SD of WHO standards) of 50% among under 5 year children, with 5% absolute precision and CI 95% which included non-response rate of 5%.

Sample size

A sample size of 403 for this study was calculated as per formula: $n = Z^2 P (1-P) / d^2$, where n =estimated sample size, Z =statistic for 95% level of confidence, $Z=1.96$, P =expected prevalence, d =absolute precision

Sampling procedure

The study was conducted in health block Hajin having total population of 210946 according to census 2011. The study sample (403) was drawn randomly from three zones of the block using multistage sampling technique based on PPS. A written informed consent was taken from parents/guardians of the participating under-fives and the necessary information was gathered from them following which, relevant examination(s) was/were done on the study participants based on pretested questionnaire. The questionnaire included questions pertaining to the general characteristics besides information on anthropometric measurements and relevant clinical examination.

Ethical clearance

Study was approved by institutional ethical committee.

Data analysis

The data thus collected was subjected to descriptive and analytical statistics using SPSS and appropriate statistical tests were applied wherever needed.

RESULTS

Table 1 shows most of children belonged to age group 25-60 months (45.9%) followed by age group 7 to 24 months (36%) and age group ≤ 6 months (18.1%). There was female preponderance (54.1%) among study subjects. Most of the study subjects were having birth order 1st (40.9%) followed by birth order second (32%) and 21.6%

had 3rd birth order. Majority of study population having birth interval between 2-3 years (40.8%) followed by birth interval between 1-2 years (30.6%) and 28.6% had birth interval more than 3 years, (3.4%) of children had

birth weight of <2.5 kg and (56.6%) had a birth weight of ≥ 2.5 kg. The birth weight of 161 (40%) of the children was not known. The mean of the birth weight was 2.86 ± 0.279 in those whose birth weight was recorded.

Table 1: General characteristics of the study population.

Variables	N	Percentage (%)
Age of child (Months)		
≤ 6	73	18.1
7-24	145	36.0
25-60	185	45.9
Gender		
Male	185	45.9
Female	218	54.1
Birth order		
1	165	40.9
2	129	32.0
3	87	21.6
>3	22	5.5
Birth interval (Months)		
12-24	73	30.6
25-36	97	40.8
>36	68	28.6
Birth weight (kg)		
<2.5	14	3.4
≥ 2.5	228	56.6
Not known	161	40.0
Mean $\pm$ SD=2.86 $\pm$ 0.279		

Table 2: Nutritional status of the study population by anthropometric indicators.

Weight for age						
Age (Months)		<Median±3SD	Median±3SD to median±2SD	Median±2SD	>Median±2SD	<Median±2SD
		Severely underweight	Underweight	Normal	Overweight	Overall underweight
≤ 6	N	1	19	51	2	20
	%	1.4	26.0	69.9	2.7	27.4
7-24	N	3	15	126	1	18
	%	2.1	10.3	86.9	0.7	12.4
25-60	N	3	15	167	0	18
	%	1.6	8.1	90.3	0.0	9.7
Total	N	7	49	344	3	56
	%	1.7	12.2	85.4	0.7	13.9
Height for age						
≤6	Severely stunted		Stunted	Normal	Overall stunted	
	N	0	5	68	5	
	%	0.0	6.8	93.2	6.8	
7-24	N	2	13	130	15	
	%	1.3	9.0	89.7	10.3	
25-60	N	5	18	162	23	
	%	2.7	9.7	87.6	12.4	
Total	N	7	36	360	43	
	%	1.7	9.0	89.3	10.7	
Weight for height						
≤6	Severely wasted		Wasted	Normal	Overweight	Overall wasted
	N	7	7	56	3	14
	%	9.6	9.6	76.7	4.1	19.2

Continued.

Age (Months)		<Median±3SD	Median±3SD to median±2SD	Median±2SD	>Median±2SD	<Median±2SD
		Severely wasted	Wasted	Normal	Overweight	Overall wasted
7-24	N	9	12	122	2	21
	%	6.2	8.3	84.1	1.4	14.5
25-60	N	2	12	167	4	14
	%	1.1	6.5	90.3	2.2	7.6
Total	N	18	31	345	9	49
	%	4.5	7.7	85.6	2.2	12.2

Table 2 shows the nutritional status of the study participants according to anthropometric indicators.

Weight for age

Overall, in the age group 0-60 month's 85.4% children had a normal weight for age. The 14.6% were malnourished among whom 13.9% were underweight and 0.7% were overweight. In the age group <6 months 27.4% children were underweight among whom 1.4% were severely underweight. In 7-24 months age group 12.4% were underweight among whom 2.1% were severely underweight. In 25-60 months age group 9.7% were underweight with 1.6% being severely underweight.

Height for age

Overall, 89.3% had a normal height for age. 10.7% were stunted among whom 1.7% were severely stunted. In the age group <6 months 6.8 % children were stunted. In 7-24 months age group 10.3% were stunted among whom 1.3% were severely stunted. In 25-60 months age group 12.4% were stunted with 2.7% having severe stunting.

Weight for height

Of the total children 85.6% had a normal weight for height. 12.2% were wasted among whom 4.5% being severely wasted. In the age group <6 months 19.2% children were wasted among whom 9.6% were severely wasted. In 7-24 months age group 14.5% were wasted among whom 6.2% were severely wasted. In 25-60 months 7.6% wasted with 1.1% having severe wasting.

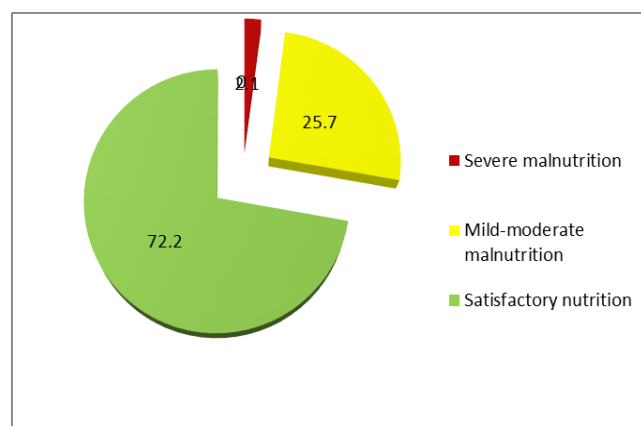


Figure 1: Nutritional status as per MAUC.

In age group 1 to 5 years as per MUAC 72.2% children had satisfactory nutritional status, 25.7% children had mild to moderate malnutrition and 2.1% had severe malnutrition.

DISCUSSION

The study was conducted in health block Hajin (the rural field practice area of department of community medicine, SKIMS). As per the calculated sample size a total of 403 under five children were randomly selected from three zones of the block based on PPS. The study population comprised of 185 (45.9%) males and 218 (54.1%) females of which 18.1% were ≤6 months of age, 36% were in age group 7-24 months and 45.9% belonged to age group 25 to 59 months. Almost a similar gender distribution was found in study conducted by Avachat et al in rural areas of Maharashtra India where 47.36% males and 54.30% females participated in the study.¹⁶ However in the studies conducted by Yisak et al in Ethiopia and Makadia et al in Gujarat India male participants were more than females.^{7,18} Akorede et al in their study reported age distribution of children as 0-6 months (40.8%), 31-59 months (34.9%), 7-12 months (17.2%) and 13-30 months as 7%.¹⁹ The prevalence of malnutrition varies across the different WHO regions and also varies from country to country depending upon socioeconomic development. The prevalence being high in lower- and middle-income countries (LMIC) and low in high income countries. Although the trend is declining but the pace is too slow. Malnutrition rates still remain alarming, stunting is declining too slowly while as overweight continues to rise. The overall prevalence of underweight, wasting and stunting in the current study was found to be 13.9%, 10.7% and 12.2% respectively. Severely underweight, severely wasted and severely stunted were 1.7%, 1.7% and 4.5% respectively where as 0.7% were overweight. Globally the prevalence of stunting declined from 32.6% to 22.2% and wasting declined from 7.5-2.4% however overweight prevalence in under five increased from 4.9% to 5.6% between 2000 and 2017. Further the prevalence of stunting and wasting declined from 38.4% to 25.7% and 8.7% to 4.3% respectively and prevalence of overweight increased from 3.2% to 7.3% between 2000 and 2017 in South East Asia.²⁰ There is considerable variation observed in nutritional status of under five children between different states of India. The review of various studies under taken by Sahu et al retrieved the information for these discrepancies.²¹ The evidence showed that the prevalence

of malnutrition among under five children was high and varied widely depending upon time and methodology adopted by different researchers. The prevalence of underweight, stunting and wasting ranged from 39%-75%, 15.4%-74% and 10.6%-42.3% respectively. The underweight prevalence of 13.9% in our study was lower than the prevalence of underweight in India (23.7%) and in J and K (21.0%) as observed in NFHS-5 (2019-2020).^{6,22} According to RSOC (2013-2014) 24.8% were underweight in the country and 15.6% in J and K which is again higher than that observed in our study.⁵ Our findings were better than that reported in studies conducted by Hien et al in Vietnam (31.8%), Yisak et al (2015) from Eastern Ethiopia (21%), Das et al from Bangladesh 33%, Debnath et al from Bangladesh (moderate underweight as) 20.6%.^{17,23-25} Malnutrition was reported to be more prevalent in Kashmir Division by Khan et al as 29.3% children were underweight against 16.2% in Jammu and 15.2% in Ladakh.²⁶ In our study 10.7% were wasted and 1.7% were severely wasted. According to NFHS-4 12.1% under fives were wasted and 5.6% were severely wasted in J and K and 21% were wasted and 7.5% were severely wasted in India.^{6,22} This observed prevalence was higher than that of our study. Our study also observed the prevalence of wasting was lower than that reported in RSOC (2013-2014)¹⁶ where 15.1% were wasted in India and that reported by Dar et al from south Kashmir J and K where overall 23.87% children were wasted but higher than that observed in J and K (7.1%) in RSOC (2013-2014).^{5,27} Also the prevalence of severely wasted in India and J and K was reported as 4.6% and 2.5% respectively in RSOC (2013-2014) which was higher than observed in our study.⁵ A study from Bangladesh (Das et al) showed that 15% were wasted and Debnath et al again from Bangladesh reported the prevalence of moderate wasting and severe wasting as 23.3% and 6.5% respectively which was higher than the prevalence reported in our study.^{24,25} Our prevalence was also slightly lower than that reported by Khan et al from J and K (13.8%).²⁶ They reported a higher prevalence of wasting in Kashmir division (14.4%) against 12.1% in Jammu and 6.9% in Ladakh, the interregional differences not being statistically significant. Hien et al in Vietnam reported a prevalence of wasting as 11.9%, while 10.7% prevalence was reported by Yisak et al from Eastern Ethiopia, the results being almost similar to our study.^{17,23} In our study 12.2% and 4.5% under-fives were stunted and severely stunted, respectively which was much lower than the results of RSOC (2013-2014) where it was reported that 38.7% were stunted and 17.3% were severely stunted in India and the figures from J and K revealed prevalence of stunting as 31.7% and severe stunting as 12.6%.⁵ The results are also in disagreement to the NFHS-4 reports where it was observed that overall 38.4% were stunted in India and 27.4% were stunted in J and K.^{6,22} The studies conducted across different countries have shown varying results. The prevalence of stunting reported in our study is also lower than that reported by Hien et al from Vietnam (44.3%), Yisak et al from Eastern Ethiopia (45.8%), Das et al from

Bangladesh (36.2%) and Khan et al from J and K (15.5%).^{17,23,24,26} An encouraging finding in our study was that the prevalence of overweight was very low (0.7%) contrary to the present rising trend of overweight and obesity. The prevalence of overweight and obesity in children under 5 years as reported by Jones et al ranges from 1-28.6% across WHO European region and 3.1% in Southern Asia as per UNICEF/WHO/world bank group joint child malnutrition report.^{20,28} Nutritional assessment of 1-5 year old children on the basis of MUAC showed that 25.7% had mild to moderate malnutrition (under nutrition) and 2.1% had severe malnutrition in our study population. The results were similar to the study conducted by Choudhary et al from Eluru A. P. India where mild to moderate malnutrition was found in 24% but severe malnutrition was 7.5% in their study.²⁹ Higher prevalence of malnutrition from India was reported by Verma et al (48.7%), Avachat et al (50.46%) and Bant et al (49.1%).^{16,23,31}

CONCLUSIONS

From the study it is concluded that prevalence of different forms of malnutrition was comparatively lower as compared to national data. Malnutrition was more in infants, female gender, under-fives belonging to nuclear families, having illiterate mothers and those belonging to lower socioeconomic status.

Recommendations

Nutrition education should always employ a wide range of hands-on teaching/learning methods. It is an important element in an overall strategy aimed at improving food security and preventing all forms of malnutrition. Pre-schools/Anganwadi centers are ideal settings for promoting lifelong healthy eating habits and lifestyles. Nutrition surveillance needs to be done continuously and special attention should be given to vulnerable groups such as poorest and the most severely malnourished children.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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