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PREVALENCE OF MALNUTRITION IN UNDER FIVE PAEDIATRIC PATIENTS ATTENDING OUTPATIENT DEPARTMENT AND THEIR MORBIDITY PATTERN IN A TERTIARY CARE IN TELANGANA, INDIA

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Abstract:

Introduction: Malnutrition and micronutrient deficiencies are common in paediatric patients contributing to higher child mortality. According to National family health survey-4, 35.7 % of children under five years of age are underweight, 38.4 % are stunted and 21.0 % are wasted in 2015-2016. Even though the prevalence of malnutrition is high in under five paediatric patients, it remains untreated. Hence the present study was conducted to estimate the prevalence of malnutrition in paediatric patients attending OPD and identifying the morbidity pattern and associated risk factors.

Methodology: A cross sectional study was done in 478 Paediatric patients attending OPD in a tertiary care, Telangana, India. Study period: July 2017 to July of 2018. All the under five patients attending for OPD services were included. After obtaining informed consent from parents, by using pre designed semi structured questionnaire data was collected by Interview method, observation of health cards and clinical examination and anthropometric measurements. Data analysed using MS excel and SPSS version 22. Statistical analysis was done using chi-square tests with $P<0.05$**.**

Results: Out of 438 patients 250(57.1%) were normally nourished, 19.6 % were underweight, 10.5% were stunted, 12.8% were wasted. Males were 57% and females were 43%. Majority of the patients belong to 49-60 months followed by 37-48 months. Diarrhoeal diseases were seen in 78(16.6%) patients, respiratory illnesses in 56(12.7%), Fever in

121 (27.6%), anaemia in 103(23.5%), Worm infestations in 34(7.8%), Skin disease in 59 (13.5%), jaundice in 14(3.2%) and Malaria in 21(4.8%).

Conclusion: Malnutrition was seen in 42.9% of study population. Associated risk factors for malnutrition were higher age group, illiterate mother and father, lower socioeconomic status, not exclusively breast fed and recurrent illnesses.

Keywords: Malnutrition, under %, paediatric, Outpatient department, India.

INTRODUCTION

General malnutrition and specific micronutrient deficiencies are common in paediatric patients. Malnutrition has been defined as "a pathological state resulting from a relative or absolute deficiency or excess of one or more essential nutrients". It comprises four forms – under nutrition, over nutrition, imbalance and the specific deficiency. [1] (a)Under nutrition : This is the condition which results when insufficient food is eaten over an extended period of time. In extreme cases, it is called starvation. (b) Over nutrition: This is the pathological state resulting from the consumption of excessive quantity of food over an extended period of time. (c) Imbalance: It is the pathological state resulting from a disproportion among essential nutrients with or without the absolute deficiency of any nutrient. (d) Specific deficiency: It is the pathological state resulting from a relative or absolute lack of an individual nutrient. [2]

Malnutrition and micronutrient deficiencies are common in paediatric patients contributing to higher child mortality [3]. Based on its etiology, malnutrition is classified as primary, caused by environmental and behavioural factors associated with low nutrient intake, and secondary, caused by one or more diseases that promote nutritional imbalance [4]. Disease- or trauma-related malnutrition stems from different mechanisms: low nutrient intake, higher nutritional requirements, higher losses, and changes in food use [5].

According to National family health survey-4, 35.7 % of children under five years of age are underweight, 38.4 % are stunted and 21.0 % are wasted in 2015-2016.[6]

Even though the prevalence of malnutrition is high in under five paediatric patients, this condition goes unnoticed and untreated. [7,8].The absence of systematic nutritional screening in outpatient department may lead to an underestimation of this condition. Hence the present study was conducted to estimate the prevalence of malnutrition in paediatric patients attending OPD and identifying the morbidity pattern and associated risk factors.

METHODOLOGY

A cross sectional study was done in Paediatric patients attending OPD in a tertiary care, Telangana, India. Study period: July 2017 to July of 2018. All the under five patients attending for OPD services were included. Under five patients with chronic and or terminally ill conditions or mental issues were excluded. Parents who were not willing to give consent were excluded.

Sample size calculated using formula 4PQ/L2 where P= Prevalence of malnutrition taken as 76% (prevalence as per study by Singh J P et al [9]) Q=1-P, L=Precision (5% of prevalence) and rounded up to 300. Paediatric patients attending OPD using were enrolled by following inclusion criteria, using purposive sampling method during study period.

Data collection: After obtaining informed consent from parents, by using pre designed semi structured questionnaire data was collected by Interview method, observation of health cards and clinical examination and anthropometric measurements. Nutritional assessment was done clinically by measuring height, weight.

World Health Organization (WHO) classification was used for the assessment of malnutrition. Based on the age, body weight and height, a number of indices such as height-for-age, weight-for age and weight-for-height have been were taken by single physician. [10] Each child's height and weight were measured in the metric system, using standardized technique recommended by Jelliffe [11]. The children are classified using three categories: 'underweight' (low weight-for-age), 'stunting' (low height-for-age) or 'wasting' (low weight-for-height). Low anthropometric values are those more than 2 SD away from the standards [9-11]. Underweight is defined as low weight-for-age and it reflects past (chronic) and present (acute) under nutrition. Children with z-scores < -2.00 are said to be underweight. Stunting is defined as a low height-for-age for children, and it measures the past (chronic) child under nutrition. Children with z-scores <-2.00 are said to be stunted. Wasting is defined as low weight-for-height for children, and it is a measure of current or acute under nutrition. Children with z-scores < - 2.00 are said to be wasted.

A stadiometer (measuring rod) capable of measuring to an accuracy of 0.1 cm was used to assess height of the subjects. The subject was made to stand without footwear with the feet parallel and with heels, buttocks, shoulders, and occiput touching the measuring rod, hands hanging by the sides. The head was held comfortably upright with the top of the head making

firm contact with the horizontal head piece. A portable balance with an accuracy of 100 g was used to record the weight of the subjects. Children were instructed to stand on the balance with light clothing and without footwear and with feet apart and looking straight. Weight was recorded to the nearest value.

Data analysed using MS excel and SPSS version 22. Statistical analysis was done using chi-square tests with P <0.05 considered as significant statistically.

RESULTS

Out of the total 438 patients, 11% belong to 0-12 months, 17.6% belong to 13-24 months, 10.7% belong to 25-36 months, 26.5% belong to 37-48 and 34.2% belong to 49-60 months. Males were 57% and females were 43%. Majority of the patients belong to 49-60 months followed by 37-48 months. (Table 1)

Table 1: Distribution of patients by age versus gender

Age in months	Female (n=198/43%)	Male (n=240/57%)	Total (N = 438)
0 – 12 months	27 (3.9%)	21 (7.1%)	48 (11%)
13 – 24 months	32(7.3%)	45 (10.3%)	77(17.6%)
25 – 36 months	21(4.8%)	26(5.9%)	47 (10.7%)
37 – 48 months	52(11.9%)	64(14.6%)	116 (26.5%)
49 – 60 months	66(15.1%)	84(19.2%)	150 (34.2%)

Out of 438 patients 250(57.1%) were normally nourished, 19.6 % were underweight, 10.5% were stunted, 12.8% were wasted. (Table 2)

Table 2: Distribution of paediatric patients based on WHO BMI Z scores

Malnutrition	Frequency	Percentage
Underweight	86	19.6%
Stunting	46	10.5%
Wasting	56	12.8%
Total	188	42.9%

Diarrhoeal diseases were seen in 78(16.6%) patients, respiratory illnesses in 56 (12.7%), Fever in 121 (27.6%), anaemia in 103(23.5%), Worm infestations in 34(7.8%), Skin disease in 59 (13.5%), jaundice in 14(3.2%) and Malaria in 21(4.8%). Few patients presented with more than one morbidity condition. (Table 3)

Table 3: Morbidity pattern in paediatric patients

Morbidity pattern	Frequency (n=438)	Percentage
Diarrhoeal diseases	78	16.6%
Respiratory illnesses	56	12.7%
Fever	121	27.6%
Anaemia	103	23.5%
Worm infestations	34	7.8%
Skin disease	59	13.5%
jaundice	14	3.2%
Malaria	21	4.8%

Malnutrition was seen in more proportion of patients in age 41-60 months (85.7%) followed by 21- 40 months (41.7%) and < 20 months (39.3%), this difference was significant statistically. Malnutrition was not associated with gender and immunization status. Malnutrition was seen in more proportion of patients in joint and three generation family (49.4%) compared to nuclear family (39%), this difference was significant statistically. Malnutrition was significantly more in Christians and others (53%), followed by Muslims (49.3%) and Hindus (38.3%), this difference was significant statistically. Malnutrition was seen in more proportion of patients who belong to class VI and V socioeconomic status (67.9%) when compared to those belonging to class I, II and III (39.3%), this difference was significant statistically. Malnutrition was seen in more proportion of patients with illiterate mothers(71.5%), compared to mothers who studied up to high school(25.4%) and its less in patients whose mothers were graduate and above(7.6%) this difference was significant statistically. Malnutrition was seen in more proportion of patients with illiterate fathers(58.5%), compared to father who studied up to high school(54.4%) and its less in patients whose fathers were graduate and above(15.9%) this difference was significant

statistically. Malnutrition was seen in more proportion of patients with recurrent illnesses (68.3%) compared to those without recurrent illnesses (32.7%), this difference was significant statistically. Malnutrition was seen in more proportion of patients with were not exclusively breast fed (50.4%) when compared to those exclusively breast fed children (31.8%), this difference was significant statistically. (Table 4)

Table 4: Distribution of under five patients by sociodemographic data

Variables	**malnutrition**			
	Yes (n=188/42.9%)	**No (n=250/57.1%)**	**Total (n=438/)**	**Chi square/ P value**
Age				
0-20 Months	64 (39.3%)	99 (60.7%)	163(37.2%)	16.73/0.00023
21- 40 months	106 (41.7%)	148 (58.3%)	254(58%)	
41- 60 months	18 (85.7%)	3 (14.3%)	21(4.8%)	
Sex				
Female	88 (20.5%)	110(27.2%)	198(47.7%)	0.3417/0.558
Male	100(24.2%)	140(28.1%)	240(52.3%)	
Immunization status				
Fully immunized	90 (43.1%)	119(56.9%)	209(47.7%)	0.0032/ .955
Completely Immunized	98(42.8%)	131(57.2%)	229(52.3%)	
Type of family				
Joint and three generation family	82(49.4%)	84(50.6%)	166(37.9%)	4.578/ 0.03
Nuclear family	106(39%)	166(61%)	272(52.1%)	
Religion				
Hindu	108(38.3%)	174(61.7%)	282 (64.4%)	7.13/ 0.028
Muslim	37(49.3%)	38(50.7%)	75(17.1%)	

Christian and others	43(53.1%)	38(46.9%)	81(18.5%)	
Socioeconomic status				
Class I, II, III	150 (39.3%)	232 (60.7%)	382(87.2%)	16.29/ 0.000054
Class IV and V	38(67.9%)	18(32.1%)	56(12.8%)	
Mother's literacy				
Illiterate	148(71.5%)	59 (28.5%)	207 (47.3%)	138/ <0.000001
High school	32(25.4%)	94(74.6%)	126(28.8%)	
Graduate and above	8 (7.6%)	97(92.4%)	105(24%)	
Father's literacy				
Illiterate	107(58.5%)	76(41.5%)	183 (41.8%)	55.01/<0.00001
High school	43 (54.4%)	36 (45.6%)	79 (18%)	
Graduate and above	38 (15.9%)	138 (84.1%)	176 (40.2%)	
Recurrent illnesses				
Yes	86(68.3%)	40(31.7%)	126(28.8%)	46.3/<0.00001
No	102(32.7%)	210(67.3%)	312(71.2%)	
Exclusively breast fed				
Yes	56(31.8%)	120(68.2%)	176(40.2%)	14.8/0.000119
No	132(50.4%)	130(49.6%)	262(59.8%)	

DISCUSSION

Presently, malnutrition still goes undetected in paediatric hospitals despite its association with poor clinical outcomes and increased annual hospital costs, thus affecting both the patient and the health care system.[12]

In this study, out of 438 patients 250(57.1%) were normally nourished, 19.6 % were underweight, 10.5% were stunted, 12.8% were wasted which was low when compared to study by Kumar Amritanshu et al, where prevalence of underweight, stunted and wasting was

30%, 74.2% and 41.9%.[13] Also study by Singh J P et, al shows that 53.86% children were underweight, 43.22% children were stunted and 60.67% were wasted.[9]

In this study malnutrition was seen in more proportion of patients in age 41-60 months (85.7%) followed by 21- 40 months (41.7%) and < 20 months (39.3%), this difference was significant statistically. Study by Singh J P et, al shows that, on comparing prevalence of under nutrition in 0-12 month age group with 13-60 month age group, it was observed that former group had a better nutritional status as compared to later group. The difference was statistically significant ($\chi 2$ =11.83, df=1, p<0.001).[19] In study by Kumar Amritanshu et al, The highest underweight prevalence belongs to 48-59 M of age group.[13]

Malnutrition was not associated with gender and immunization status in this study. In study by Kumar Amritanshu et al, Family type and sex of the child does not appear to be significantly affecting child nutrition. In study by Kumar Amritanshu et al, more females were found to be stunted and wasted, though the gender difference here was not statistically significant.[13] Where as in study by Tigga PL et al, The overall sex-difference in mean MUAC was observed to be statistically significant (F=7.64; d.f.: 1, 1221; p<0.05). [14]

Malnutrition was seen in more proportion of patients with illiterate mothers (71.5%), compared to mothers who studied up to high school (25.4%) and its less in patients whose mothers were graduate and above (7.6%) this difference was significant statistically in our study. In study by Kumar Amritanshu et al, maternal education appear to be associated with better child nutrition and differences were observed to be statistically significant (P=<0.001).[13]

Malnutrition was seen in more proportion of patients with illiterate fathers(58.5%), compared to father who studied up to high school(54.4%) and its less in patients whose fathers were graduate and above(15.9%) this difference was significant statistically in our study. In study by Kumar Amritanshu et al, Father's with no education has high underweight (58.6%) and wasted (58.6%) children as compared to father with primary and higher education, and the difference was statically significant related to underweight and wasting (P=0.002 and P=0.021 respectively).[13]

Malnutrition was seen in more proportion of patients in joint and three generation family (49.4%) compared to nuclear family (39%), this difference was significant statistically in our study. In study by Kumar Amritanshu et al, Prevalence of underweight, stunting and wasting

(40%, 77.1%, 48.5% respectively was more in Hindus but the observation was not statically significant. So religion does not appear to affect the nutritional status of children. [13]

Malnutrition was seen in more proportion of patients who belong to class VI and V socioeconomic status (67.9%) when compared to those belonging to class I,II and III(39.3%), this difference was significant statistically in our study . Study by Singh J P et,al shows that prevalence of under-nutrition was higher among children from low income group as compared to higher income group, however the association was not found significant ($\chi 2$ =2.48, df=4, p>0.1).[9]

In this study diarrhoeal diseases were seen in 78(16.6%) patients, respiratory illnesses in 56 (12.7%), Fever in 121 (27.6%), anaemia in 103(23.5%), Worm infestation in 34(7.8%), Skin disease in 59 (13.5%), jaundice in 14(3.2%) and Malaria in 21(4.8%).In study by Massod A et al, Commonest morbidity was malnutrition (70.71%), followed by ARI (63.59%), anaemia (47.76%), diarrhea (20.58%), malaria (13.33%) and worm infestation (10.03%) while around 25 percent suffered from other illnesses. Most common symptom was fever (70.71%) and cough (62.8%). [15] In study by Murali Et al, ARI (55.6%) followed by diarrhea (19.8%), worm infestation (9.6%) and skin infection (6.4%) were the most common morbid conditions observed.[16]

CONCLUSION

Out of 438 patients 250(57.1%) were normally nourished, 19.6 % were underweight, 10.5% were stunted, 12.8% were wasted. Malnutrition was not associated with gender and immunization status in this study. Associated risk factors for malnutrition were higher age group, illiterate mother and father, lower socioeconomic status, not exclusively breast fed and recurrent illnesses. Diarrhoeal diseases were seen in 78(16.6%) patients, respiratory illnesses in 56 (12.7%), Fever in 121 (27.6%), anaemia in 103(23.5%), Worm infestations in 34(7.8%), Skin disease in 59 (13.5%), jaundice in 14(3.2%) and Malaria in 21(4.8%).

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