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RESEARCH ARTICLE

PREVALENCE OF UNDERWEIGHT AND ITS ASSOCIATED RISK FACTORS AMONG UNDER FIVE CHILDREN OF RURAL FIELD PRACTICE AREA OF A MEDICAL COLLEGE IN MAHARASHTRA, INDIA

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Abstract

Nutrition plays a key role in physical, mental and emotional development of children and much emphasis has been given to provide good nutrition to growing population especially in the formative years of life. This study aimed to estimate prevalence and associated risk factors of underweight among under five children of rural field practice area. Community based cross sectional study was undertaken in rural field practice area of the department of Community Medicine of government medical college. Study was conducted during 1st December 2021 to 31st January 2022. Children below 5 years in the selected area was included as the study participants. Institutional ethical committee permission was obtained prior to the start of study. Among the study participants as per weight for age criteria 446 (70.23) were having normal nutritional status and 189 (29.77) were undernourished. SES of family, use of marketed food & non-exclusive breast feeding significantly affected the malnutrition in under five children.

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Introduction:-

Nutrition plays a key role in physical, mental and emotional development of children and much emphasis has been given to provide good nutrition to growing population especially in the formative years of life.^{1,2,3} Childhood morbidity and mortality is a sensitive indicator of a country's socio-economic development. Protein energy malnutrition (PEM), which is manifested as decrease in weight for age or height for age or weight for height, is the most widely prevalent form of malnutrition among the children.⁴ Globally; more than one third of child deaths are attributable to under nutrition.⁵ Under nutrition among under five children in India is a major public health problem.⁶ Most common causes of under nutrition include faulty infant feeding practices, impaired utilization of nutrients due to infections and parasites, poor immunization status, inadequate food and health security, poor environmental conditions and lack of proper child care practices.⁷ Under nutrition during the critical phases of early growth, can lead not only to the stunting of physical growth, but also to sub-optimal intellectual development and poor neuro integrative competence in children.⁸ Considering that under nutrition is an important nutritional problem, the present study was undertaken to assess the status of malnutrition among under five children residing in Rural Field Practice Area of Government medical college.

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Study Objectives:-

1. To estimate the prevalence of underweight among under five children of rural field practice area.
2. To study the various risk factors of underweight among under five children of rural field practice area.

Material And Methods:-

Community based cross sectional study was undertaken in rural field practice area of the department of Community Medicine of government medical college. Study was conducted during-1st December 2021 to 31 January 2022. Children below 5 years in the selected areas was included as the study participants. Institutional ethical committee permission was obtained prior to the start of study.

Inclusion criteria:

Children ≤ 5 years of age residing in the given area for more than one year.
Parent willing to participate in study.

Exclusion criteria:

Critically ill children under treatment.

All study subjects who fulfil the inclusion criteria will be enrolled by the investigator after obtaining informed consent from their legal guardian.

Study was done in three primary health centres (PHC) of rural health training centre of government medical college. For every single PHC two Anganwadi is selected with simple random sampling using lottery method. PHC 1 have sixty Anganwadis, PHC 2 have sixty eight Anganwadis, PHC 3 have forty eight Anganwadis. Using proportionate to size sampling technique desired sample size of 635 was achieved.

Data Collection:

A predesigned questionnaire will be used for data collection. Children ≤ 5 years of age after consent from their parent was enrolled in the study. Before start of study, purpose and procedures involved in the study will be explained to the Parents. They will be assured regarding confidentiality of the information. Collection of data will start after obtaining informed consent. The questionnaire has three parts. The first part consist of sociodemographic characteristics. Data regarding personal information of each child was taken from the Anganwadi records including age, religion, parent's information (education status and occupation) and socioeconomic status was assessed using Modified B.G.Prasad classification. The second part comprises clinical examination of study participants which involves detailed examination from head to toe to assess any micro and macronutrient deficiency, infection or other anomalies. The data included weight, recumbent length (for children less than 24 months of age) and height (for children more than 24 months of age). Weight was measured to the nearest 0.1 Kg and electronic weighing machine was used for weight measurement.

WHO classification was used for the assessment of underweight. Based on the age and body weight, weight-for-age was calculated. Children below -2 SD of the reference median on any of these indices were considered as undernourished and termed as underweight. Children below -3 SD were considered to be severely undernourished.[9]

Sample Size:

Sample size was calculated by OpenEpi software using prevalence of malnutrition among the under five children as 40.2 % based on a previous study;¹⁰ with relative precision of 10% and a confidence interval (CI) of 95%, minimum sample size required for the study was be 577. $577+10\%$ margin as drop outs = 635

Statistical Analysis Details:

Data will be entered systematically in master chart by using MS excel. The data on categorical variables will be presented as n (% of cases) and the values on continuous variables will be presented as Mean \pm Standard deviation (SD). Chi square test will be used for qualitative data. P-values less than 0.05 will be considered to be statistically significant.

Result:-**Table No.1:-** Socio-demographic profile of study participants.

Parameter	No. of participants	Percentage
Age		
<12 months	58	9.13
13-24 months	134	21.10
25-36 months	156	24.57
37-48 months	149	23.46
49-60 months	138	21.74
Total	635	100
Gender		
Male	319	50.24
Female	316	49.76
Total	635	100
SES		
Class I	86	13.54
Class II	157	24.72
Class III	195	30.71
Class IV	166	26.15
Class V	31	4.88
Total	635	100
Religion		
Hindu	569	89.61
Muslim	66	10.39
Total	635	100
Type of family		
Nuclear	205	32.29
Joint	430	67.71
Total	635	100

It was observed that out of the total study participants 156 (24.57) were in the age group of 25-36 months followed by 149 (23.46) in the age group of 37-48 months and 134 (21.10) each in the age of 49-60 months.

About half of the male and female children participated in the study. Most of the children i.e., 195 (30.71) attending anganwadi belongs to SES III as per BG Prasad classification followed by 166 (26.15) children belongs to Class IV, 157 (24.72) children belongs to class II and 86 (13.54) children belongs to class I i.e., upper class. It was observed that most of children i.e., 569 (89.61) belongs to Hindu religion and 66 (10.39) belongs to Muslim religion. Most of the study participants i.e., 430 (67.71) belongs to joint family and 205 (32.29) children belongs to nuclear family. (Table 1)

Table No.2:- Nutritional status wise distribution of study participants.

Nutritional status	No. of participants	Percentage
Normal	446	70.23
Underweight	189	29.77
Total	635	100

Out of the total study participants as per weight for age criteria 446 (70.23) were having normal nutritional status and 189 (29.77) were underweight.

Table No.3:- Socio demographic profile of underweight children.

Parameter		Normal	Underweight	Total	P value
Age	6-12 months	42 (72.41)	16 (27.59)	58 (100)	0.359
	13-24 months	103 (76.86)	31 (23.14)	134 (100)	
	25-36 months	104 (66.67)	52 (33.33)	156 (100)	

	37-48 months	101 (67.78)	48 (32.22)	149 (100)	
	49-60 months	96 (69.56)	42 (30.44)	138 (100)	
Gender	Male	234 (73.35)	85 (26.65)	319 (100)	0.08
	Female	212 (67.08)	104 (32.92)	316 (100)	
Type of family	Nuclear	135 (67.40)	70 (34.15)	205 (100)	0.095
	Joint	311 (73.10)	119 (27.68)	430 (100)	
Religion	Hindu	404 (71.01)	165 (28.99)	569 (100)	0.215
	Muslim	42 (63.64)	24 (36.36)	66 (100)	
SES	Class I	68 (79.06)	18 (20.94)	86 (100)	0.007
	Class II	121 (77.07)	36 (22.93)	157 (100)	
	Class III	125 (64.10)	70 (35.90)	195 (100)	
	Class IV	115 (69.28)	51 (30.72)	166 (100)	
	Class V	17 (54.84)	14 (45.16)	31 (100)	
Prelacteal food	Yes	93 (69.92)	40 (30.08)	133 (100)	0.929
	No	353 (70.32)	149 (27.8)	502 (100)	
Frequency of feeding	>3 times	110 (75.86)	35 (24.14)	145 (100)	0.018
	3 time	225 (72.11)	87 (27.89)	312 (100)	
	2 time	111 (62.36)	67 (37.64)	178 (100)	
Marketed food	Yes	235 (66.76)	117 (33.24)	352 (100)	0.032
	No	211 (74.56)	72 (25.44)	283 (100)	
Green leafy vegetables	Yes	331 (72.11)	128 (27.89)	459 (100)	0.094
	No	115 (65.34)	61 (34.66)	176 (100)	
Exclusive breast feeding	Yes	8 (44.45)	10 (55.55)	18 (100)	0.015
	No	438 (70.98)	179 (29.01)	617 (100)	

Above table shows proportion of underweight study participants was more than 30% in children above 24 months of age. Difference observed was not statistically significant. Female participants were more underweight compared to the male participants [104 (32.92) vs 85 (26.65)]. Difference among the gender was not statistically significant. Participants from nuclear family 70 (34.15) were underweight compared to the participants from joint family 119 (27.68). Children belonging to Muslim family were more underweight compared children from Hindu family [24 (36.36) vs 165 (28.99)]. Most of the underweight participants i.e., 14 (46.15) belongs to lower socio-economic class followed by 70 (35.90) participants belongs to middle (class III) SES and 51 (30.72) participants from lower middle class (IV SES). Observed difference among social class was statistically significant. Among the underweight children 40 (30.08) participants received pre lacteal feeds. Frequency of weaning food among underweight participants was ≥ 3 times a day in 35 (24.14) participants, two times in day in 87 (27.89) participants. Difference observed in frequency of feeding and underweight was statistically significant. Among the underweight children 117 (33.24) received marketed food and half of the children were not exclusively breast feed. Difference observed in each group was statistically significant.

Discussion:-

The present study was conducted to measure the undernutrition among under 5 children and to know risk factors associated with undernutrition. Total 635 children participated in the study.

The most of the children (i.e., 45.67) participated in the study was in the age group of 12-36 months. Shashank K J et al [11] observed that majority of children were between the age group of 13 and 36 months. Study conducted by Anita G. Shenoy et al 12 observed that maximum children (28.14%) were in the age group of 25-36 months. In the present study boys and girls involved were equal in number. Similar findings were observed in the study conducted by Shashank K J et al [11] In the present study 89.61% and 67.71% of the participants belongs to the Hindu family and joint family respectively. Anita G. Shenoy et al 12 observed that most of the children (96.7%) participated in the study were Hindu. Study conducted by Shashank K J et al [11] observed that 78.3% of children belongs to Hindu family and 72.2% children belongs to joint family.

In the present study overall 189 (29.76) participants were underweight. Shashank K J et al [11] observed that 44.7% of the children were underweight. In contrast to the observation in the present study Shreyaswi Sathyanath M et al [13] revealed that out of 133 under-5 children surveyed 84 (63.16) were undernourished. Nazia Zahoor et al[14]

observed that out of 300 children studied, 141 (47%) were having malnutrition in the form of underweight. Study conducted by Hely B. Patel et al [15] observed that the prevalence of underweight, was 45%. Anita G. Shenoy et al [12] observed that prevalence of underweight, was 56.30%.

Proportion of under-nutrition was more than 30% in the participants with age group 24 months and above. Nazia Zahoor et al [14] observed that most of the children who were underweight belong to age group of 24-47 months. In the present study female participants was more undernourished compared to the male participants [104 (32.92) vs 85 (26.65)].

Shivali Suri et al [16] observed that higher proportions of girls (31.1%) as compared to boys (26.5%) were suffering from various grades of under-nutrition. Difference among the gender was not statistically significant. Shreyaswi Sathyanath M et al [13] revealed that majority of the undernourished were females (65.47%). The gender difference in under nutrition with females having higher prevalence has been found in several other studies both at regional and national levels. [17,18,19] Nazia Zahoor et al [14] observed that among 141 underweight children 82% were females and 19.2% males and difference was statistically significant.

Among the 18 non exclusively breast feed participant 10 (55.55) were undernourished. Shreyaswi Sathyanath M et al [13] revealed that majority of the children who were not exclusively breast fed were undernourished.

In the present study proportion of underweight was maximum in socioeconomic class V i.e., 14 (45.16) and least in socioeconomic class in class I i.e., 18 (20.94) participants. Hely B. Patel et al [15] observed that the prevalence of underweight was more in socio-economic class IV i.e., 54.7% compared to that in II and III socio-economic class (28.5% and 34.2%). Harishankar et al [20] and Reddy et al [21] in Uttar Pradesh also revealed similar results.

Conclusion:-

In the present study prevalence of undernutrition was 29.76%. The risk of under nutrition was significantly more in children from lower socio-economic class, use of marketed food, not exclusively breast feed babies and frequency of feeding.

Limitations:

Maternal factors like maternal BMI and antenatal care, socio demographic factors and other environmental factors which also play significant role in childhood under nutrition are not explored.

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