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Prevalence of Underweight and its Risk Factors among Under Five Children in a Rural Area of Kancheepuram District in Tamil Nadu, India

Stalin P[1], Joy Bazroy[2], Dinesh Dimri[1], Zile Singh[2], Senthilvel V[1], Sathyanarayanan S[3]

[1] *Assistant Professor, Dept. of Community Medicine, Pondicherry Institute of Medical Sciences, Puducherry*
[2] *Professor, Dept. of Community Medicine, Pondicherry Institute of Medical Sciences, Puducherry*
[3] *PG Student, Dept. of Community Medicine, Pondicherry Institute of Medical Sciences, Puducherry*

Abstract: ***Background:*** *India is contributing to around 20% of world total under five children deaths. Major cause of under five children deaths is malnutrition and multiple factors are involved in determining the nutritional status of the children. Therefore the objective of the study is to measure the prevalence of underweight and to study the selected factors associated with underweight among children under five years of age residing in a rural area.* ***Methods:*** *A community based cross sectional study was conducted. We have interviewed 563 parents/guardians of under five children using a structured questionnaire consisting of socio-demographic factors, natal history, feeding practices etc. The weight (in kg) was measured using Bathroom weighing scale (> 1 year of age) and infant weighing scale and grading was done as per Indian Academy of Paediatrics (IAP) classification.* ***Results:*** *The prevalence of underweight among under five children was 52.9%. Around 7% of children were severely malnourished. The prevalence of underweight among children under the age of one year was 62.4%. Females (62.6%) were more malnourished than males (44.0%). Children belonging to higher socio-economic status (40.0%) were less malnourished than lower socioeconomic status (47.2%).* ***Conclusion:*** *The burden of underweight was very high and some important risk factors for underweight were age, females and lower socio-economic status. Therefore, any interventions to prevent and solve the problem of undernutrition should focus on these high risk groups.*

Key words: *Children, Prevalence, Risk factors, Underweight*

I. Introduction

Children have the right to caring, protective environment and to nutritious food and basic health care to protect them from illness and to promote growth and development. Around 7.6 million of under five children were dying every year. Out of 7.6 million, 80% of deaths were occurring in Sub-Saharan Africa and Southern Asia. India alone contributes to 1.6 million of under five children deaths. Worldwide, the major killers of children under five years of age are pneumonia (18 percent), diarrhoeal diseases (15 per-cent), preterm birth complications (12 percent) and birth asphyxia (9 percent). Undernutrition is a major cause in more than half of under-five deaths [1].

In India, around 43% of under five children were underweight according to the report of third national family health survey conducted during 2005 – 06. There was huge interstate variation i.e the range was from 19.7% in Sikkim to 60% in Madhya Pradesh [2]. Socio-demographic variables like age, gender, socio-economic status are associated with underweight [3]. Role of maternal literacy is very crucial in determining the nutritional status of under five children [4]. Underweight among the pregnant women would lead to low birth weight babies which is an important risk factor for childhood under nutrition. Breast feeding, feeding practices like complementary feeding are the other factors directly related to the nutritional status of the children [5].

Nutritional status of preschool children is very important, since the foundation of healthy life is laid during that period. Malnutrition in early childhood has serious, long-term consequences because it impedes motor, sensory, cognitive, social and emotional development. In order to solve the problem of underweight, it is necessary to measure its burden and understand its risk factors. In this context the present study was conducted to measure the prevalence of underweight and to study the selected factors associated with underweight among children under five years of age residing in a rural area located at Kancheepuram district of Tamilnadu.

II. Material And Methods

The study settings was the rural area of Chunampet, Cheyyur taluk of Kancheepuram district in India which is the field practice area of Rural Health Training Centre under the Department of Community Medicine, Pondicherry Institute of Medical Sciences, Pondicherry. It was a community based cross-sectional study, carried out in nine villages located in and around Chunampet during February 2012. The study participants were all

children aged between 0-5 years residing in the study area. Children who were not accompanied by their parents/ guardians were excluded from the study. 563 children who were accompanied by their parents/guardians were approached and interviewed. A pre-tested structured questionnaire was used to collect the data regarding age, sex, mother's education, socioeconomic status, caste, natal history, feeding practices and utilization of Anganwadi centre (Nutrition & Health Centre) from the parents/guardians of the study participants. The weight (in kg) of the children less than one year of age was measured using Infant weighing scale and the weight (in kg) of the children more than one year of age was measured using Bathroom weighing scale. The children were in minimal clothing and without footwear when measurements were taken. For grading of Protein Energy Malnutrition, Indian Academy of Pediatrics (IAP) classification was used. The data was collected by the undergraduate medical students under the supervision of interns, postgraduates and faculty. Data was entered in the MS Excel 2007 and analysis was done in SPSS 16.0. Proportions were calculated and p-value was calculated using chi-square tests. Parents /guardians of the children were informed about the study and invited to participate in the study. Informed verbal consent was obtained from the parents / guardians. Children identified with unhealthy conditions/diseases were examined and treated by Interns/Post graduates under the guidance of Faculty. Participants who required further management and follow up were referred to higher centre.

III. Results

Table 1 shows the prevalence of underweight among under five children and grades of malnutrition as per IAP classification. The prevalence of underweight among under five children was 52.9%. According to IAP classification, the proportions of mild and moderate malnutrition were 47.1% and 30.9%. Around 7% of children were severely malnourished.

The prevalence of underweight among under five children in relation to socio-demographic factors was shown in Table 2. The prevalence of underweight among infants was 62.4% which was the highest as compared to other age groups. Females (62.6%) were more malnourished than males (44%). The children of the mothers who studied upto higher secondary (37.7%) and graduation (46.9%) were less malnourished. The prevalence of underweight among under five children who belongs to class 1 and class 2 socio-economic status was 40% and 43.7%. Under five children belonging to class 4 socio-economic status were more malnourished (63.4%). The prevalence of underweight among under five children belonging to Scheduled Caste/Scheduled Tribe was 51.6% while for backward class was only 37.5%.

Table 3 shows the prevalence of underweight among under five children in relation to certain risk factors. The prevalence of underweight among under five children whose mothers had never visited antenatal clinic during their pregnancy was 57.1%. It was 47.5% for under five children whose mothers had visited antenatal clinic more than 11 times during their pregnancy. Underweight prevalence was lesser among children of mothers who delivered at full term of pregnancy (52.4%) than who delivered at pre and post term (58.3%). Under five children who had received breast milk for less than 12 months (56.5%) were more malnourished. The prevalence of underweight among under five children who were fed with prelacteal feeds was 54.7%. The prevalence of underweight among under five children was almost similar (52%) for those who received or not received bottle feeding. Children who were utilizing anganwadi centre (50.0%) were less malnourished than who were not utilizing it (54.8%).

Table 1: Prevalence of Underweight among Under Five Children and IAP Classification of malnutrition (n = 563)

	Frequency (n)	Percentage (%)
Prevalence of Underweight		
Normal Children	265	47.1
Underweight Children	298	52.9
IAP Classification		
Normal	265	47.1
Grade I (mild)	174	30.9
Grade II (moderate)	84	14.9
Grade III (severe)	29	5.2
Grade IV (very severe)	11	1.9

Table 2: Prevalence of Underweight among under five children in relation to socio-demographic factors (n = 563)

Variables	Total Children (n)	Underweight Children n (%)	P value
Age (months)			
0 – 12	125	78 (62.4)	.150
13 – 24	114	59 (51.8)	
25 – 36	109	52 (47.7)	
37 – 48	107	57 (53.3)	
49 – 60	108	52 (48.1)	
Sex			
Male	293	129 (44.0)	.000
Female	270	169 (62.6)	
Mother's Education			
Illiterate	87	45 (51.7)	.139
Primary School	45	24 (53.3)	
Middle School	119	70 (58.8)	
High School	219	121 (55.3)	
Higher Secondary	61	23 (37.7)	
Graduation	32	15 (46.9)	
Socio -economic Status*			
(Highest) Class 1	10	4 (40.0)	.004
Class 2	87	38 (43.7)	
Class 3	120	56 (46.7)	
Class 4	194	123 (63.4)	
(Lowest) Class 5	123	58 (47.2)	
Caste			
Forward Class	115	67 (58.3)	.410
Backward Class	8	3 (37.5)	
Most Backward Class	95	50 (52.6)	
Scheduled Caste & Scheduled Tribe	345	178 (51.6)	

***(Modified B. G. Prasad's Classification) (n = 534)**

Table 3: Prevalence of underweight among under five children in relation to selected risk factors

Risk Factors	Total Children (n)	Underweight Children n (%)	P value
No. of Antenatal Visits (n = 537)			
1-5	145	75 (51.7)	.918
6-10	338	183 (54.1)	
11-20	40	19 (47.5)	
Never visited	14	8 (57.1)	
Duration of Pregnancy (n = 546)			
Full term	498	260 (52.2)	.890
Pre term & Post term	48	20 (41.7)	
Duration of Breast Feeding (n = 543)			
<12 months	276	156 (56.5)	.240
12 - 24 months	210	100 (47.6)	
>24 months	57	30 (52.6)	
Prelacteal Feeding (n = 545)			
Yes	75	41 (54.7)	.726
No	470	246 (52.3)	
Bottle Feeding (n = 545)			
Yes	121	64 (52.9)	.778
No	424	223 (52.6)	
Utilization of Anganwadi Centre (n = 563)			
Yes	220	110 (50.0)	.265
No	343	188 (54.8)	

IV. Discussion

In our study, almost fifty percent of children under five years of age were underweight. The HUNGaMA survey which was conducted in 2011 found that the prevalence of underweight was 42% among 100 focus districts located in 6 states and 33% among best performing districts [6]. The prevalence of underweight in our study was higher than that of HUNGaMA survey at national level. Our study area was from the district Kancheepuram of state Tamilnadu, which was one of the districts in state Tamilnadu where HUNGaMA survey was carried out. According to HUNGaMA survey, the prevalence of underweight in Kancheepuram district was 28% only [6]. In our study, the prevalence of underweight was almost double as that of HUNGaMA survey. This difference could be explained by the higher proportions of lower socio-economic status people residing in our study area. However the proportion of severe underweight was almost comparable between our study and HUNGaMA survey. The prevalence of underweight in our study was similar to that (56.4%) of study conducted in a rural area located in Aligarh district of Uttar Pradesh [7].

In our study, the prevalence of underweight was higher among the infants than other age groups. Females were more malnourished than males in the present study. However there was no gender difference in a similar study conducted in a rural area of West Bengal [8] which was also supported by National Family Health Survey (NFHS) 3 data [2]. Children of mothers who had completed higher secondary/graduation were better nourished than other children. Children belonging to lower socio-economic status were poorly nourished than those belong to upper socio-economic status. This association between nutritional status of children and socio-economic status was similar to the findings of previous studies [2, 9]. There was also an association between antenatal care and nutritional status of children. The feeding practices were not found to be associated with child nutritional status in our study which is in contrast to the present knowledge of the condition. Since it was statistically not significant, the absence of association might be due to chance. We recommend conducting higher level studies with large sample size in the future. In conclusion, the prevalence of underweight was very high in our study population. Most of the underweight children were infants, females and those who belong to lower socio-economic status. Therefore, they should be the primary targets for interventions to fight against the malnutrition.

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