Under nutrition And Its Determinants among Children between 1-5 years of age residing In an Urban Slum of Bagalkot city, Karnataka State

Vasundara Gayakawad[1], Gowri Shankar[2,*]

[1]Assistant Professor, [2]Professor, Dept. of Community Medicine, [1]Gadag Institute of Medical Sciences, Gadag, [2]S.N. Medical College, Bagalkot, India

***Corresponding Author:**
Email: drgowrijnmc@gmail.com

Abstract

Introduction: Under five children are vulnerable population in the community with respect to malnutrition especially those residing in urban slums. Malnutrition is a major contributing factor for under five deaths. **Objective**: This study was done to know the prevalence of under nutrition and its determinants in children between 1-5 years of age.

Materials and Method: This cross sectional study was conducted from June 1st 2015 to August 31st 2015. Based on prevalence of underweight (48.1%) in a study done in Gulbarga, Karnataka, a sample of 109 Children between 1-5years age group residing in urban field practice area and enrolled in anganwadi were recruited using simple random technique. Mothers of these children were interviewed using predesigned, Pretested, Semi-structured proforma after taking informed consent. Under nutrition was graded using WHO 2006 anthropometric standards. Data was analyzed by using Open Epi software.

Result: Prevalence of underweight, stunting and wasting were 48.6%, 45% and 20% respectively. Low birth weight (65%) and lower socioeconomic status (class IV-58.2% and Class V- 41.7%) were significantly associated with underweight among these children (p= <0.05). Proportion of underweight was high in children aged 3-5 years (55-67.6%). Children who received colostrum, exclusively breastfed for 6 months and timely weaning was done showed lower proportion of underweight.

Conclusion: Prevalence of under nutrition is high in this area and hence MCH services should focus on antenatal mothers and awareness regarding child feeding practices and low cost weaning foods should be created.

Keywords: Under Nutrition, Children Aged 1-5years, Urban.

Introduction

The most vulnerable period next to infancy is the age of 1 – 5 yr.(1) More than half (54%) of all deaths before age of 5 years in India are related to malnutrition.(2) Malnutrition is a problem among the urban poor, as they are a neglected segment of population in terms of basic services and amenities.(3) Malnutrition is a very common condition affecting health of children globally. Children between 1-5years are mainly preschool children or toddlers and this is an important age group for growth and development.(4)

Children between 1-5years represent 9.7% of general population and large majority of urban toddlers reside in slums.(5) Prevalence of under nutrition in developed and developing countries varies from 1.4% - 24% respectively.(4) In India, prevalence of moderate to severe underweight is 43% and severe underweight is 16% respectively.(5) More than 1/3rd of worlds children who are wasted live in India. It is estimated that there are 61 million stunted children in India that accounts for more than 3 out of 10 stunted children in the world.(6) Under five mortality in India is 56% and 50% of these deaths are due to malnutrition7. Karnataka is one among 7 states in India which has high under five malnutrition.(4)

Malnutrition is the result of interaction of multiple factors in the community. Socio-cultural factors along with birth weight, breast feeding and weaning practices have a vital role in the etiology of malnutrition and these determinants may vary from area to area.(8) Infants may be easily reached, toddlers are not only hard to reach but also difficult to look after.(4)

Hence, keeping all these facts in mind, this study was done to study the prevalence of under nutrition and its determinants in children between 1-5years of age residing in urban field practice area of S.N.M.C Bagalkot where such a study has not been done earlier.

Materials and Method

A community based, cross-sectional study was conducted in the urban slum of urban field practice area of S. Nijalingappa Medical College, Bagalkot from June 1st 2015 to Aug 31st 2015.

According to a study done in Gulburga,(9) prevalence of under nutrition was 48.1%. So sample size calculated with the formula $4pq/L^2$, taking p=48.1%, q=100-p= 51.9%, allowable error (L) = 20% of p that is 9.6, was 109.

After Institutional Ethical Clearance and obtaining informed consent from mothers of the children, house to house survey was done for the presence of under five children until the sample size was achieved. By simple random procedure, a total of 109 children between 1-5years of age were included in the study who was residing in the urban slum of urban field practice area. If in one house more than one children between 1-5years of age were present then one child was selected randomly. All children included in the study were enrolled in Anganwadi centers.

Mothers of the study subjects were interviewed and data was collected using a pre-designed semi-structured questionnaire. Weight was measured through standard procedure with minimal reading of 100gms using Salter weighing scale of max 25 kg. Height was measured using a non-stretchable tape fixed to a vertical wall, with the study subject standing on level surface and it was measured to the nearest 0.5 cm. Recumbent length (for children 12 - 24 months of age) was measured by using an infantometer.[4] Socio-economic status (SES) - was determined by using Modified Prasad's scale.[11]

Data was entered and tabulated in Microsoft Excel 2007 spread sheet, and subsequently it was analyzed using Open Epi software. Descriptive statistics (mean, standard deviation and percentages) wherever necessary were employed. The various factors and their association with nutritional status were studied using Chi square test. P value of <0.05 was considered statistically significant.

Assessment of the malnutrition was done by using WHO 2006 Growth charts. Anthropometric indices such as height-for-age, weight-for-age and weight-for-height were calculated. The children were classified as underweight, stunted and wasted. Underweight is defined as low weight-for-age for children that reflect both acute and chronic under nutrition. Children with z-scores < -2SD and < -3SD are said to be moderate and severe underweight respectively. Stunting is defined as a low height-for-age for children and measures chronic under nutrition. Children with z-scores -2SD and < -3SD are said to be stunted and severely stunted respectively. Wasting is defined as low weight-for-height for child which is a measure of current or acute under nutrition. Children with z-scores -2SD and < -3SD are said to be wasted and severely wasted respectively.[10]

Results

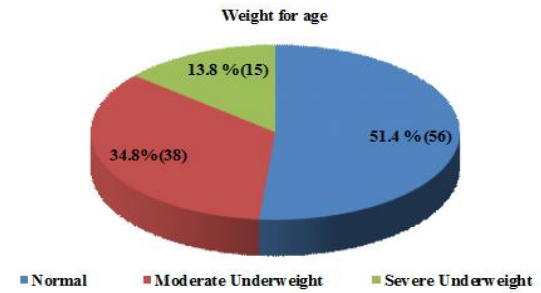


Figure 1: Prevalence of underweight in children aged 1-5years

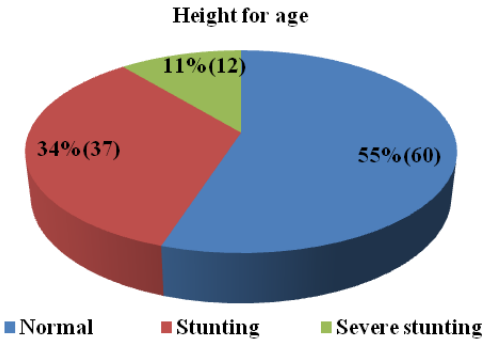


Figure 2: Prevalence of stunting in children aged 1-5years

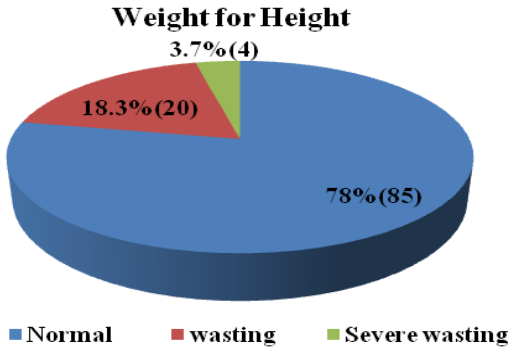


Figure 3: Prevalence of wasting in children aged 1-5years

A total of 109 children aged 1-5 years were studied. Mean (± SD) age of children was 33.2±13.2 months with 50 (45.9%) female children and 59 (54.1%) male children.

It was found that 48.6% children were found to be underweight, out of which 34.8% were moderately underweight, and 13.8% were severely underweight (Fig. 1). Stunting and severe stunting was found among 34% and 11% respectively, together constituting 45% (Fig. 2). Wasting and severe wasting was observed in 18.3% and 3.7% children respectively. (Fig. 3)

It was observed that as age increases underweight increased i.e. 33.3% children were underweight among 12-23 months of age, 50% children among 24-35 months of age, 55.2% children among 36-47 months of age and 68.7% children among 48-59 months of age. Male children (51%) had higher proportion of underweight than female children (42%). These differences were not statistically significant. (Table 1)

Table 1: Distribution of Underweight among Subjects According To Age and Sex

Age in years	Normal weight	Underweight	Total (N=109)
≥1- <2years	24 (66.7%)	12 (33.3%)	36 (33.0%)
≥2-<3 years	14 (50.0%)	14 (50%)	28 (25.7%)
≥3-<4 years	13 (44.8%)	16 (55.2%)	29 (26.6%)
≥4-<5 years	5 (31.3%)	11 (68.7%)	16 (14.7%)

Sex	Chi square value =9.688, p = 0.138 df=6		
Male	27 (45.8%)	32 (54.1%)	59 (54.1%)
Female	29 (58%)	21 (42%)	50 (45.8%)
Chi square value =1.433, p = 0.116 df=1			

Children belonging to class IV (58.2%) and class V (41.7%) showed underweight in higher proportion followed by class III (20%). There were only 2 children who belonged to class II and both had normal weight (Table 2). This difference was found statistically significant (p = 0.017).

Table 2: Distribution of Subjects according To Socioeconomic status and underweight

Socioeconomic status	Normal weight	Underweight	Total
Class II	2 (100.0%)	0 (0%)	2 (1.8%)
Class III	12 (80%)	3(20%)	15(13.8%)
Class IV	28(41.2%)	40 (58.8%)	68(62.4%)
ClassV	14(58.3%)	10(41.7%)	24(22%)
Total	56 (51.4%)	53 (48.6%)	109(100.0%)
Fischer exact p value= 0.017659* df=3			

There were 31.2% children who had birth weight less than 2.5 kg at birth. Underweight was more among children who were born Low birth weight (64.7%). (Table 3) This difference was statistically significant. (p=0.02)

Table 3: Distribution of Subjects According To Birth Weight and Underweight

Birth weight	Normal weight	Underweight	Total
Less than 2.5 kg	12 (35.3%)	22 (64.7%)	34 (31.2%)
2.5 kg and more	44 (58.7%)	31(41.3%)	75(68.8%)
Total	56 (51.4%)	53 (48.6%)	109(100.0%)
Chi square value =5.116, p = 0.02* df=1			

Children born in 1st order (65.3%) had higher proportion of underweight than subsequent birth orders. This difference was not found statistically significant. (p=0.413)

Primary Immunization (up to measles) was completed in 84.4% children. There were 17(15.6%) children who were partially immunized. No child was unimmunized. Association was not found between immunization status and underweight. (Table 4)

Table 4: Distribution of Subjects According To Immunization Status and Underweight

Immunization	Normal	Underweight	Total
Fully Immunized	45 (49%)	47 (51%)	92 (84.4%)
Partial Immunized	11 (64.7%)	06 (35.3%)	17 (15.6%)
Total	56 (51.4%)	53 (48.6%)	109(100.0%)
Chi square value =1.433, p = 0.116 df=1			

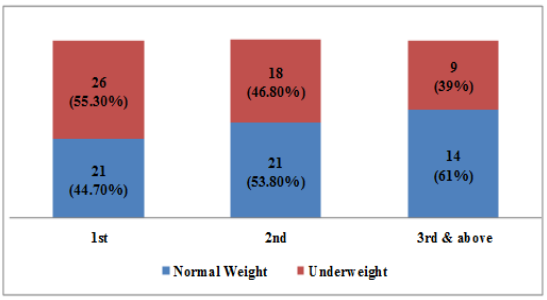
Underweight was less among children who received colostrum (45.8%) as compared to those who did not receive colostrum (54.2%). Underweight was less among those who were breast fed exclusively for about 6months (46%) as compared to those who were breast fed less than 6 months (46%) or breast fed for more than 6 months (58%). Underweight was low among children in whom timely weaning with continuation of breast feeding for appropriate period was done (39.5%). These differences were not found statistically significant. (Table 5)

Table 5: Distribution of Subjects according To Feeding practices And UnderweightP

Feeding Practices		Normal Weight (n=56)	Underweight (n=53)	Total (n=109)
Colostrum	Received	39(54.2%)	33 (45.8%)	72(66%)
	Not received	17(45.9%)	20 (44.1%)	37(34%)
Chi square value =0.6612, p = 0.41 df=1				
Exclusive Breast feeding	<6m	13(52%)	12 (48%)	25(33%)
	Up to 6 months	17(54%)	14 (46%)	31(41%)

	>6m	8(42%)	11 (58%)	19 (26%)
Chi square value =0.616, p = 0.73 df=2				
Weaning practices	Early with Breast Feeding	3 (33.3%)	6 (66.7%)	9 (8.2%)
	Early without Breast Feeding	5 (41.7%)	7 (58.3%)	12 (11%)
	Timely	26 (60.5%)	17 39.5%)	43(39.5%)
	Delayed	21 (48.8%)	22 (51.2%)	43 (39.5%)
	No weaning	1 (50.0%)	1 (50%)	2 (1.8%)
Chi square value =3.16, p = 0.53 df=4				

Figure 3: Distribution of Subjects According To Birth Order and Underweight



Chi square value =1.268 p value = 0.413 df= 2

Environmental sanitation status was poor and satisfactory among 38% and 44% of subjects. Only 19% children had own toilet facility at their home.

Discussion

NFHS-3 data at national level revealed 43% underweight, 20% wasting and 48% stunting among under five children.[5] In Karnataka (NFHS-4), underweight, wasting and stunting were 35.2%, 10.5% and 36.2% respectively.[12] Under nutrition was found to be higher in this study area. These findings were consistent with studies done in urban slums of Mumbai[3] and Bhubaneswar, Orissa.[13] In contrast, a study done in Gulbarga among children attending well baby health camp revealed lower proportion of underweight(42.7%), wasting(15.6%) and stunting (20.8%) in under five children.[9] This may be due to poor socioeconomic background of majority of the study subjects.

The Present study revealed that underweight was more among older children i.e., more than 3 years. Similar findings were observed in studies done in rural children of Jaipur and urban slums of Mumbai.[2,3] All children were enrolled in anganwadi and were receiving anganwadi food as per mothers statement. Inspite of this, underweight was more which could be due to the fact that they show likes to foods available at local shops that decrease their appetite and mothers feeding practices were poor.

There was no statistically significant association found between sex of the children and underweight. This finding was in contrast to studies done in rural areas of Aligarh[1] and Jaipur[2] where significantly under nutrition was high among female children.

In India 28% children born are Low Birth weight with an estimated number of 7.4 million per year.[6] In the present study, children born with low birth weight were 31.2%. Low Birth Weight and Lower socioeconomic status were significant factors associated with underweight in present study. Comparable findings were observed in studies done in Gulbarga[9] & Kerala[14] where LBW was found as an important risk factor. And studies done in Jaipur[2] and Aligarh[1] reveal that children belonging to lower socioeconomic class suffered from higher proportion of underweight.

The Proportion of underweight increased among the children as the birth order decreased. This was in contrast to a study done in rural area of Jaipur where proportion of underweight increased as the birth order increased.[2] This might be due to inadequate spacing between births. Optimal spacing (3years and above) was observed among 19 (17.4%) subjects. As mother gets engaged with young ones, the elder ones feeding practices will be neglected.

UNICEF reports that Exclusive Breast Feeding (EBF) is prematurely stopped in 46.4% in India. In this study, it was found to be 33%. Underweight was less in children who received colostrum, Exclusive breast feeding upto 6 months & timely weaning was done. This difference was not found statistically significant. These findings were consistent with studies done in urban slums of Varanasi[8] and Gulbarga[9] where as in contrast, no relation was seen between feeding practices and under nutrition in a study done in Mumbai slum children.[3]

Fully immunized children were 84.4% which was higher compared to State figure (62.5%) and National figure (55%). Similarly immunization status was found to be better than national data in studies done in Kerala[14] and Pune.[15] In a study done in Gulbarga[9] there were 8.5% unimmunized children and 26.4% partially immunized children. Immunization status was not associated with underweight in the present study which was inconsistent with studies done in urban slum community of Varanasi[8] and Pune.[15] In contrast, in a study done in Kerala[14] incomplete immunization contributed to more under nutrition.

Majority of the children lived in an environment sanitation that was poor. Almost all children practiced open air defecation around the house premises (even

those having own toilets at home). Anganwadi also do not have toilet facilities for children. These facts make these children at risk for parasitic infections which leads to malnutrition.

It is known fact that infections lead to malnutrition and malnutrition reduces the immunity making susceptible for infections and becomes a vicious cycle. More than 1/3rd children (37.7%) showed common childhood illness like ARI, diarrhea and fever. Out of these, 14.7% had severe illness requiring hospitalization. The study area is situated near backwaters and potential vector breeding site.

Conclusion and Recommendations

Prevalence of under-nutrition among these under-five children was high. Under nutrition was more in older children. It was also associated with low birth weight and low socioeconomic status. Gaps were also observed in breast feeding and weaning practices.

There is a need to improve the nutritional status of children aged 1-5 years. Mothers should be sensitized for better utilization of Maternal Child Health and Integrated Child Development Scheme services as malnutrition starts from womb. Nutritional education should be given to mothers regarding proper breast feeding and timely weaning with easily available foods at low cost. This was done in our urban field practice area through 'sneha shivir' Programme. Awareness regarding family planning services especially spacing methods needs to be stressed. Political commitment as well as health education is needed to improve the environmental sanitation. A comprehensive child health care package should include complete primary immunization with 9 doses of Vitamin A supplementation, monthly health check-up for early identification of common child hood illness, monthly growth monitoring, regular mass de-worming every 6 months and administration of iron and folic acid for these children in collaboration with UHTC and Health and family welfare. IEC regarding child nutrition should be done involving the community members, mahila samukhya groups and other self-help groups.

Acknowledgement: The authors acknowledge the medico-social workers of Urban Health Training Centre, Anganwadi workers and the co-operation of community.

Conflict of Interest: No

References

1. Ahmed E, Khalil S, Khan Z. Nutritional status in children (1-5yrs) - A Rural Study. Indian Journal of Community Health July - Dec 2011;23(2):84-86.
2. Sonkaria L, Zafer A, Gaur K L, Sharma M C. Nutritional Status of 1-5 Years Children in Field Practice Area of RHTC Naila, Jaipur. International Journal of Innovative Research & Development Mar 2014;3(3):324-27.
3. Mukherjee K. Malnutrition in under five children in Turbhe stores urban slums in Navi Mumbai. Int J Med Sci Public Health 2014;3:1127-31.
4. Park K. Park's textbook of Preventive and Social Medicine, Banarsidas Bhanot Publishers. 23nd Edition, 2009;521-607.
5. International Institute for Population Sciences (IIPS) and Macro International. 2007. National Family Health Survey. (NFHS-3), 2005–06: India: Volume I. Mumbai: IIPS.
6. UNICEF Statistics. Available from: https://data.unicef.org/infobycountry/india-statistics.html. (Accessed 5 Jan 2017).
7. Nutrition. Available from: http://unicef.in/Story/1124/Nutrition. (Accessed 5 Jan 2017).
8. Baranwal K, Gupta VM, Mishra RN. Impact of Dietary Pattern on Nutritional Profile of Underfive Children in Urban Slum Community of Varanasi. Indian J. Prev. Soc. Med 2012;43(3):244-8.
9. Phukan P, Jagtap A, Nagaraj SB. Child health related millennium development goals (MDGs): Status of under five children visiting a well baby camp. Int J Med Sci Public Health 2014;3:1064-1068.
10. WHO. The WHO Child Growth Standards. Available from: http://www.who.int/childgrowth/standards/en/ [last accessed on 23/08/2015].
11. Labour Bureau. Available from: URL: http://labourbureau.nic.in/indnum.htm. [last accessed on 23/08/2015]
12. State Factsheet. National Family Health Survey, India 2016. Available from: http://rchiips.org/nfhs/pdf/NFHS4/KA_FactSheet.pdf (accessed 5 Jan 2017).
13. Panigrahi A and Das SC. Undernutrition and Its Correlates among Children of 3–9 Years of Age Residing in Slum Areas of Bhubaneswar, India. The Scientific World Journal Dec 2014;2014:1-9.
14. Priyanka R, Vincent V, Jini MP, Saju CR. An assessment of the nutritional status of underfive children in a rural area of Thrissur district, Kerala, India. Int J Community Med Public Health 2016;3:3479-86.
15. Mamulwar MS, Rathod HK, Jethani S, Dhone A, Bakshi T, Lanjewar B, et al. Nutritional status of underfive children in urban slums of Pune. Int J Med Public Health 2014;4:247-52.