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Assessment of Nutritional Status of Street Children in Selected Wards of an Urban Area

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Abstract

Malnutrition is the gravest single threat to global public health. Malnutrition is by far the largest contributor of child mortality globally. Severe hunger is especially prevalent amongst street children who are most vulnerable to disease and live under extremely difficult conditions. The objective of the paper is to assess the nutritional status and association between socio-demographic factors in street children from selected wards of the urban area. The study place is selected wards of Mumbai. History was taken from parents or relatives of the child while clinical examination and anthropometric measurements were performed on the child. The data collected is from a cross-sectional study where a pre-designed structured questionnaire was used. The used method for obtaining samples is a universal one. The statistical analysis is for conditions of stunting, under nutrition and wasting and was calculated according to WHO growth standards set forth in 2006. 121 children were surveyed, out of which 56 were females. About 77 per cent out of total children were malnourished. Out of the total number of malnourished children, 43 per cent of children were stunted, 38 per cent were underweight and 19 per cent are wasted. About 36 per cent had fever, 27 per cent had U.R.T.I and 17 per cent had suffered from diarrhoea in the past one year. Of the total number of children, about 26 per cent had not been given colostrum and 73 per cent were not exclusively breast fed. Majority of the malnourished children were not exclusively breastfed and they had suffered from infections in the past one year. Maternal education had a strong inverse relationship to nutritional status.

Key words: Nutritional status, street children, malnutrition.

Introduction

Malnutrition continues to be the grave problem despite India's considerable social and economic progress over the decades particularly among vulnerable population of the community. It is a significant public health problem described as silent killer, silent emergency and an invisible enemy affecting those who cannot express their voice and have to depend on others for their advocacy. Malnutrition is much like an 'iceberg', its deadly menace lies mostly hidden from the view.

The 2011 Global Hunger Index (GHI) Report ranked India 15th amongst leading countries with a hunger situation¹. Malnutrition is a major health problem, especially in developing countries. It affects almost 800 million people— 20 per cent of the total populations in the developing world. It is associated with about half of all child deaths worldwide^{2,3}.

Table 1. Prevalence of nutritional status of children in India (in per cent) ⁴

Nutritional status of children	Rural (in per cent)	Urban (in per cent)	NHFS-3(in per cent)	NHFS-2 (in per cent)
Stunted	47.2	37.4	44.9	51.0
Wasted	24.1	19.0	22.9	19.7
Underweight	43.7	30.1	40.4	42.7

Despite the fact Indian economy was experiencing a much celebrated “BOOM” during post 1990’s, the nutritional status of its citizen was found to be very poor. As per the Table 1, it is observed that the number of stunted and underweight children decreased over the years marginally but the number of wasted children has increased⁴. Malnutrition plagues a disproportionately large number of children in India compared with most other countries.

Pavement dwellers, as the term suggests, are people who have erected their homes along pavements. Pavement slums are a phenomenon peculiar to the largest Indian metropolises (especially Calcutta and Mumbai). They are radically different from what people generally understand slums to be. They are not the jhopadis or bastis which spring up on vacant lots or stretches of land, but hutments actually built on the footpaths/pavements of city streets, utilizing the walls or fences which separate building compounds from the pavement and street outside. Children should be at home, school or playing in an environment in which there is a conducive interaction for physical, motoric, social, psychological and moral developments of children. However, such conditions are not experienced by street children⁵. The numbers of these children in urban populations are yet to be determined accurately because of the difficulty in calculating their extent-they are always mobile. It is estimated that the number of world’s street children has reached any number between 30-170 million children. Every year, the number of street children increases. The number of street children may reach 800 million by 2020 if there is no serious effort to overcome the problems faced by street children⁶.

Malnutrition is especially prevalent amongst street children who are most vulnerable to diseases and live under extremely difficult conditions; deprived of basic amenities and facilities. They are directly exposed to the ill-effects of environmental conditions. Moreover, they reside in very unhygienic conditions. The families are engaged in activities generating low income leading to insufficiency of food and they are nomadic in nature as per their work and cultures. Irregular food habits and food quality below the standard of nutritional requirement have made street children susceptible to health problems. Urban migration has not provided them salvation from poverty and under- nutrition. Hence, street dwellers are the worst sufferers of malnutrition. The problem affects the young particularly under-5 year old children who are at a stage of rapid growth and therefore more affected. This population is the most affected segment of the community. Their nutritional status is a sensitive indicator of community health.

Malnutrition results from a combination of causes or factors and conditions. Low birth weight arises from poor maternal nutrition, early marriages, repeated pregnancies, short birth intervals apart from other factors. Malnutrition in young children can be attributed to inadequate feeding, faulty feeding practices, repeated infections like diarrheal diseases, acute upper respiratory tract infections and worm infestations. Economically weaker sections and illiterate families bear the brunt of malnutrition. The consequences of malnutrition in young children are high levels of morbidity, mortality and disability apart from poor physical growth and development.

Malnutrition's most devastating impact is in the womb when the foetus can fail to develop properly and during the first years of a child's life when it can hamper her or his physical and mental development. In any community, the mother and the child have always been considered as one unit at many levels; including biologically, socially and culturally. A child's nutritional future begins before conception with the mother's nutritional status prior to pregnancy. Lack of breastfeeding exposes infants to an increased risk of deaths and diseases in childhood. Malnutrition weakens the immune system, making a child susceptible to disease, increasing severity of illness and impeding recovery.

The proportion of under-nutrition among children in India is one of the highest in the world. India is committed to halving the prevalence of underweight children by 2015 as one of the key indicators of progress towards achieving the MDGs.

The present study was conducted in street children to assess the nutritional status of children less than 5 years of age and to find associations between their nutritional status and various socio-demographic factors.

The objectives of the study are to: (1) assess nutritional status of street children in selected wards of urban area; (2) find association between socio-demographic factors and nutritional status of street children from selected wards of urban area; (3) derive upon sustainable recommendations based on current.

Inclusion criteria:

1) Street children (< 5 years of age) from selected wards of urban areas; and 2) Parents of street children willing to participate in the study.

Exclusion criteria:

Participants denying consent for study.

Materials and Methods:

Nutritional status of less than 5 years street children were obtained from a cross-sectional survey conducted between November 2011 and December 2011 in selected wards of urban area from Mumbai. Research tool used was a pre-structured close ended questionnaire with two sections.

The first section consisted of information regarding the child, the family data, migration history, age of mother at marriage, age of mother at time of the birth of the child being studied, number of children in the family, interval between deliveries, infections that the child has suffered and other child care variables including whether were colostrum fed, if the child had been exclusively breast-fed till 6 months and the time of weaning. The second section related to clinical features of a child and his anthropometric measurements. Prior to beginning of the survey, the mother was briefed about the study and her consent was obtained for the same.

History was taken from parents or relatives of the child while clinical examination and anthropometric measurements were performed on the child. Weight measurement were taken by a standard weighing machine while height and mid arm circumference were taken by using a standard measurement tape. Universal sampling was done. One hundred and twenty one children were surveyed that were encountered during the survey from the selected wards. Stunting, wasting and severely acute malnutrition based on WHO 2006 growth standards (z-score) were calculated. Anthropometric indices were calculated using reference medians recommended by the World Health Organization and classified according to standard deviation units (z-scores), based on the WHO criteria.

Wasting (weight-for-height z-score–WHZ) indicates thinness. It is usually the result of recent nutritional deficiency and is affected by seasonal shifts associated with the availability of foods and/or prevalence of disease.

A weight-for-height z-score of less than two deviations defines the presence of acute malnutrition (wasting). Stunting, represented by low height-for-age z-score (HAZ), results from extended periods of inadequate food intake, poor dietary quality, increased morbidity, or a combination of these factors. A height-for-age z-score of less than two deviations defines chronic malnutrition (stunting). Weight-for-age z-score (WAZ) is essentially a composite of weight-for-height and height-for-age, thus it is a measure of both acute and chronic malnutrition. A WAZ of less than two deviations is used for defining a child as underweight^{7, 8}. A z-score of less than three deviations defines severe levels of each of the indices and all other analyses were done using the SPSS.

Results

One hundred and twenty one street children were encountered during the survey. About 53 per cent were males and 47 per cent were females; About 49 per cent was Hindus while 51 per cent were Muslims. About 6 per cent children were below 24 months of age while 94 per cent children were between 24 months to 60 months of age. About 88per cent children had institutional births while 12per cent children were born during home deliveries. The gross monthly income of 24per cent families was below Rs 2500. About 23 per cent of the children lived in joint families while 71 per cent children lived in nuclear families, 6 per cent lived in three generational families. About 3 per cent of the children had single parents while 97per cent had both parents. In total 9.3 per cent fathers and 94.2 per cent of mothers were illiterate. About 54 per cent women married before the age of 18 years, 35 per cent women were married between the ages of 18 to 20 years, 11 per cent women were married between the ages of 20 and 24 years while 0.8 per cent of the women were married after 25 years of age. About 55 per cent of the children are malnourished who were born before the age of mother turns 18 years.

Table No. 2 Age at marriage and nutritional status

Age at Marriage	Nutritional Status of children		Total
	Malnourished	Normal	
≤ 18 years	66(54.5%)	17(14.1%)	83(68.6%)
> 18 years	27(22.3%)	11(9.0%)	38(31.4%)
Total	93(76.8%)	28(23.1%)	121(100%)

Chi square = 1.05 at df 1, p =0.305 (NS)

Approximately 35.5 per cent of women gave birth to their first child between the ages of 18 to 20 years. Out of about 63 per cent of the couples having children more than two, it is reported that 49% are malnourished. Hence, it shows that more the number of children less are its nutritional status.(Table 3)

Table No. 3 Birth order and nutritional status

Birth Order	Nutritional Status		Total
	Malnourished	Normal	
< 2 children	34(28%)	11(9.0%)	45(37.2%)
≥ 2 children	59(48.8%)	17(14.1%)	76(62.8%)
Total	93(76.8%)	28(23.1%)	121(100%)

Chi square– 0.06 at df 1, p =0.79 (NS)

About 74 per cent children were colostrum fed. About 73 per cent were not exclusively breast fed. Out of total children 33 per cent of children were weaned within 6 months, 63 per cent children were weaned between 6-12 months of age while rest 4 per cent was weaned after 12 months.

The prevalence of top three infections seen in these street children in the past one year were 35.6per cent had fever, 27.2per cent had U.R.T.I and 17.3per cent suffered from diarrhoea. Out of about 73% of children that were not exclusively breast fed, 67per cent of children had past infections in past one year and 57% were malnourished.(Table 4)

Table No. 4 Exclusively breastfed and past infections

Exclusively Breastfed	Past infections		Total
	Yes	No	
Yes	19(15.6%)	14(11.6%)	33(27.2%)
No	81(67.0%)	07(5.8%)	88(72.8%)
Total	100(82.6%)	21(17.4%)	121(100.0%)

Chi square – 18.88 at df 1, p <0.0001 (VHS)

Table No. 5 Exclusively breastfed and nutritional status

Exclusively Breastfed	Nutritional Status		Total
	Malnourished	Normal	
Yes	24(19.8%)	09(7.4%)	33(27.2%)
No	69(57.0%)	19(15.8%)	88(72.8%)
Total	93(76.8%)	28(23.2%)	121(100.0%)

Chi square – 0.436 at df 1, p=0.50 (NS)

About 26per cent have dry, scaly skin. Approximately 1per cent has flaky paint dermatitis. About 2per cent have bow legged. About 2.5per cent had oedema. About 6per cent had dental caries, Angular conjunctivitis was seen in 1.7per cent of children and dry eyes were seen in 1.7per cent of total children. About 16per cent have diffuse depigmentation. Cheilosis is seen in 2.4 per cent.About 59.5 per cent was thin and 16.6 per cent were sickly. Out of total children, 76.9 per cent were malnourished. Out of total malnourished children, 43 per cent of them are stunted, 38 per cent are underweight and 19 per cent are wasted. 81.6 per cent of the males and 71.4 per cent of the females were malnourished. Among the males, 60per cent were stunted, 58.4per cent were underweight and 36.9per cent suffered from wasting. Among the females, 60 per cent were stunted, 46per cent were underweight and 11 per cent suffered from wasting(Table 5).

Discussion

One hundred twenty one street children were studied during the survey. 53.1 per cent were males and 46.3 per cent were females. 48.8 per cent were Hindus while 51.2 per cent were Muslims.

About 6 per cent of children are below 24 months of age while 95 per cent are between 24 months to 60 months old. About 88per cent of these children had institutional births while 12 per cent of them had home delivery. The gross monthly incomes of 24per cent of the families were below Rs 2500.

About 23per cent of the children were from joint family, 71per cent were from nuclear family while 6 per cent

were from three generational families.

About 3per cent of the children have single parent while 97per cent have both parents. 79.3per cent of the father's and 94.2per cent of the mothers were illiterate. About 54per cent of the women married before the age of 18 years, 35per cent of the women married between the ages of 18 to 20 years, 11per cent of them were married between the ages of 20 to 24 years while 0.9 per cent women married by the age of 26 years.

About 36per cent of the women gave birth to their first child in between 18 to 20 years. About 73.5 per cent of total children were given colostrum and 27.2 per cent were exclusively breast fed.

Thirty three percent of children were weaned within 6 months. About 62per cent of the children were weaned between 6 to 12 months of age. Rest of the children was weaned in after 12months old. About 73per cent have normal skin, 26.4per cent have dry and scaly skin and rest 0.8per cent has flaky paint dermatitis.

About 4per cent have hair without luster, 20per cent have thin and sparse hair, 1per cent children have easy pluckable hair. Almost 27.2 per cent children suffered from URTI, 17.3 per cent of them suffered from diarrhea, 35.4 per cent children had suffered fever in past one year.

Beatrice Olack, Heather Burke, Leonard Cosmos et al., (2011) reported 46per cent URTI, 25per cent of fever and 18per cent of gastro-enteritis. In the current study, 1.7per cent had bow legs. 9.1per cent had pale tongues and 0.8 per cent had geographic tongue. 7.4per cent had pale colored nails. 5.7per cent had caries in their teeth. 15.7per cent have diffuse depigmentation. 0.8 per cent had moon face. 1.7 per cent has angular conjunctivitis, 1.7 per cent had dry eyes. 59.5 per cent children were thin and 16.5 per cent were sickly⁹.

In the current study, 23.14 per cent children fell into the normal range category.

Goyle Anuradha, Shekhawat Neetu, Saraf Harsha et al., (2005) determined the nutritional status of 296 street children in Jaipur city through the use of anthropometric measurements. That study reported that 25.3 per cent of those street children, in age group of 24-60 months, fell in the normal range category¹⁰.

Biswas R, Ray SK, Mishra R et al., (1999) determined the nutritional status of pavement dweller children of Calcutta city. Out of 216 children in the age group of 24-60 months, 27.6 per cent were of normal category¹¹.

Garg SK, Singh JV, Bhatnagar M et al., (1997) determined the nutritional status of children aged 1-6 years in the slums of Ghaziabad city. The authors found much higher percentages of the children falling in the normal category as compared to the study cited earlier. About 46 per cent of the children in the age group of 1-3 years were found to belong in the normal category, while 39.2 per cent of the children aged between 3-6 years were found to belong to the same category¹².

The data of these four studies are comparable and present a dismal picture of malnutrition among street children. In the present study, 43 per cent of children were stunted, 38 per cent were underweight and 19 per cent were wasted.

Benta A Abuya, James Ciera and Elizabeth Kimani-Murage (2012) determined the nutritional status of the slum children of Nairobi, Kenya. Out of 5156 children aged between newborns and42 months, 40 per cent showed stunting.¹³

Beatrice Olack, Heather Burke, Leonard Cosmos et al., (2011) determined the nutritional status of under-5 children living in an informal settlement in Nairobi, Kenya. 1245 children were surveyed and it was observed that 47 per cent of the children were stunted, 11.8 per cent were underweight and 2.6 per cent of them were suffering severe acute

malnutrition⁹.

Alom J, Quddus M.A and Islam M.A, (2011) assessed the nutritional status of children under five years of age in Bangladesh; a study which revealed that 16 per cent of the children were severely stunted and 25 per cent were moderately so, 3 per cent were severely wasted and 14 per cent were moderately wasted. Furthermore, 11 per cent of the children were severely underweight and 28 per cent were moderately underweight¹⁴.

Goyle Anuradha, Shekhawat Neetu, Saraf Harsha et al., (2005) reported that 87.6 per cent were underweight, 62.8 per cent stunted, 26.5 per cent wasted¹⁰.

Biswas R, Ray S.K, Mishra R et al., (1999) surveyed 435 under-5 pavement-dwelling children in Calcutta. Results revealed about 35 per cent and 70 per cent of street dweller children had wasting and stunting respectively¹¹.

Awasthi S and Pande VK (1997) carried out a study on 1061 children who were between the age of 1.5 years and 3.5 years and enrolled in an Aanganwadi centre in an urban slum of Lucknow. On comparing their height and weight data with the growth standard of WHO, the authors of this study found that 87.6per cent were underweight, 62.8per cent stunted and 26.5per cent wasted¹⁵.

In the present study, a total of 77.9per cent street children examined were malnourished with 81.5per cent of males and 71.4per cent of females suffering from malnutrition.

Banerjee B and Bandopadhyay L (2005) determined the nutritional status of an urban slum in Kolkata and found a that 55.38 per cent of those children were malnourished; 77.6 per cent females were malnourished and 31.7 per cent males were also malnourished¹⁶.

Biswas R, Ray SK, Mishra R et al., (1999) found that the over-all prevalence of malnutrition among the female section of the group was 71.9 per cent, while 67.1 per cent¹¹.

Dwivedi SN, Banerjee N and Yadav OP (1992) reported the over-all prevalence of malnutrition among the females was 65 per cent in comparison with the males which was 61.9 per cent¹⁷.

Ray SK, Roy P, Deysakari S et al., (1990) reported 68.83 per cent females were malnourished as against 46.53 per cent of males¹⁸.

The above 5 studies are comparable. The overall prevalence of malnutrition was more in females than male. Malnutrition among females continues to be unabated.

Garg SK, Singh JV, Bhatnagar M et al., (1997) also did not find significant sex variation in nutritional status of the children¹².

Busi BR, Saileela M, Babu AD et al., (1991) showed from the data that the boys were observed to do better than girls in nutritional status at all age (6-60 months)¹⁹.

Hence, the anthropometry data shows the extent of malnutrition in street children. In the present study no significant sex variation is observed.

Conclusions

Majority of street children are malnourished. Majority of malnourished children were not exclusively breastfed. Majority of malnourished children suffered from infections in the past one year. Nearly half of the mothers were married below legal matrimonial age. Maternal education had a strong inverse relationship to nutritional status.

The present study findings reveal that problem of malnutrition is multifaceted and has various links to socio-economic and demographic factors. So a multi-pronged attack involving various departments is of utmost concern in order to reach the Millennium goal of reducing malnutrition by half by the end of 2015.

Recommendations

Promotion of exclusive breast feeding till 6 months of age, supplementary food along with breast feeding, eating clean food, washing of hands, drinking safe and wholesome water, having fewer children at appropriate intervals, immunization at right age and ensuring adequate growth and health of young children.

Malnutrition in children under-5, especially a vulnerable section of the population like street children, is still a major problem in our country. Every endeavor should be made to combat this problem through a multi-pronged approach like growth monitoring, nutritional supplementation, nutritional rehabilitation and, last but not least, nutrition education.

References:

- (1) "Global Hunger Index Report 2011 ". International Food Policy Research Institute (IFPRI).
- (2) Tershakovec AM, Stallings VA. Çocukta beslenme ve beslenme bozuklukları. In: Behrman, RE, Kliegman, RM (eds). Nelson Essentials of Pediatrics (2nd ed). İstanbul: Nobel Tip Kitapevleri Ltd. Sti & Yüce Yayınları; 1996:55-91.
- (3) www.who.int/watersanitation_health/diseases/malnutrition/en/ WHO, Water-related Diseases, 2004., Accessed on 29-6-2012
- (4) National Family Health Survey (NFHS 3), 2005–06, India: Vol. I, & National Fact Sheet, *International Institute for Population Sciences*, Mumbai, September 2007.
- (5) Burra, Sundar, Riley, Liz. Electricity to pavement dwellers in Mumbai. September. 1999 <http://www.sparcindia.org/docs/mumbaielectric.txt>. Accessed on 27-6-2012.
- (6) Rita Patriash, Isma Widiaty, Mitra Dewi, Dadang Sukandar 2010. Nutrients Intake And Nutritional Status Of Street Children in Bandung, Indonesia. *Journal of Nutrition and Food* 5(3):178-184
- (7) WHO Child growth standards 2006. Arm circumference for age. Available at: http://www.who.int/childgrowth/standards/ac_for_age/en/index.html.
- (8) WHO Child Growth Standards 2006.
- (9) Olack B, Burke H, Cosmas L, Bamrah S, Dooling K, Feikin D, Talley L and Breiman. Nutritional Status of Under-five Children Living in an Informal Urban Settlement in Nairobi, Kenya. *Journal of Health Population & Nutrition*. 2011; 29(4): 357–363.
- (10) Goyle A, Shekhawat N, Saraf H, Jain P and Vyas S. Nutritional status of Children residing in Squatter Settlements on Pavements and Along Roadsides of Jaipur City as determined by Anthropometry. *Anthropologist*. 2005; 7(3):193-196
- (11) Ray S.K, Mishra R, Biswas R, Kumar S, Halder A, Chatterjee T. Nutritional status of pavement dweller children of Calcutta city. *Indian Journal of Public Health*. 1999; 43(1):49-55
- (12) Garg S, Singh J, Bhatnagar M, Chopra H. Nutritional status of children in slums of Ghaziabad city. *Indian Journal of Community Medicine*. 1997; 12 (2):70-73
- (13) Abuva B, Ciera J, Kimani-Murage, E. Effect of mother's education on child's nutritional status in the slums of Nairobi. *BMC Pediatrics*. 2012; 12(1):80
- (14) Alom J, Quddus M, Islam M. Nutritional status of under- 5 children in Bangladesh. *Journal Biosocial Science*. 2012; 24: 1-11.
- (15) Awasthi S and Pande V. Seasonal pattern of morbidities in preschool slum children in Lucknow, north India. *Indian Pediatric*. 1997; 34: 987-993.
- (16) Banerjee B and Bandyopadhyay L. Gender Differences in Nutritional Status. *Indian Pediatrics*. 2005; 42: 400
- (17) Dwivedi S, Banerjee N, Yadav O. Malnutrition among children in an urban Indian slum and its associations. *Indian Journal of Maternal and Child Health*. 1992; 3(3): 79-81
- (18) Ray S, Roy P, Deysarkari S, Lahiri A, Mukhopadhyaya B. A cross sectional study of under nutrition in 0-5 years age group in an urban community. *Indian Journal of Maternal and Child Health*. 1990; 1(2): 61-62.
- (19) Busi, B. R.; Sai Leela, M.; Rector Babu, A. D. W.; Rani S, P. R. Growth pattern among pre-school children in urban slums of Visakhapatnam. *Indian Journal of Nutrition & Dietetics*. 1991; 28: 188-193