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## Full Length Research Article

### NUTRITIONAL DEFICIENCIES AND SUBSTANCE ABUSE PATTERN IN STREET CHILDREN

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#### ABSTRACT

**Background:** Street children are predisposed to develop malnutrition and different nutritional deficiencies. Also they are vulnerable to develop substances abuse of different types. The present study intends to study that aspect of street children.

**Aims and objectives:** To study the various nutritional deficiencies and substance abuse pattern in street children.

**Materiel and Methods:** The present study was conducted in Department of Paediatrics, Padmashree Dr. D.Y. Patil Medical College, Pimpri, Pune during the period August 2010 to September 2012. 204 street children were studied with respect to their nutritional status and various macro and micro nutrient deficiencies. Also substance abuse pattern was studied in them. After thorough history and physical examination, relevant investigations were carried in them.

**Results:** The majority, 126 (61.76%) of subjects were in age group 1 to 5 years followed by 31 in 16 to 18 years age group, 26 in 6 to 10 years age group and remaining 20 cases were in age group of 11 to 15 years. The majority, 111 (54.41%) of subjects were males and remaining 93 were females. 60 (47.62%) were having grade 4 PEM, followed by 25 (19.84%) with grade 2 PEM. 23 (18.25%) were in grade 3 PEM, maximum number of children had grade 4 PEM. Anemia was present in significant number of subjects with both macrocytic and microcytic anemia. Vitamin A deficiency was seen in 42 cases with grade 4 PEM. Vitamin B deficiency was seen in 46 cases with grade 4 PEM. Vitamin C deficiency was seen in 52 cases with grade 4 PEM. Children with grade 4 PEM have more prevalence of vitamin deficiency. Tobacco and ghutaka was seen as a major form of substance abuse followed by alcohol in some. No relation was found between different genders and substance abuse pattern against a common belief that substance abuse would be more common in male gender.

**Conclusion:** Malnutrition was found to be very common in street children. Iron and B12 and vitamin A&D deficiencies were found to be the common macronutrient deficiencies in them. Vitamin B complex deficiency was also significant in them. Tobacco and ghutaka was seen as a major form of substance abuse followed by alcohol.

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#### INTRODUCTION

Children are the wealth of any nation as they constitute one of the important segments of the population. Children in the age group of 5-14 years are often considered as school age. United Nations Educational Scientific and Cultural Organization (UNESCO) since 1972, for the purpose of statistics consider 6-11 years as primary school age and 12-17 years as secondary school age. It is recorded that in India one fifth population comprises of children between 5-14 years, the age group covering primary and secondary school age (Kumari, 2005).

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The term "Street Children" in a very narrow sense may suggest children such as those popularly known as 'rag pickers' in India, 'parking boys' in Kenya, 'Peggy boys' in the Philippines, 'pivetes' in Brazil, 'pajaro-frutero' in Peru and 'homeless youth' or 'runaways' in some developed countries. While all these do qualify as street children, their descriptions do not constitute an adequate working definition. UNICEF (1988), describes street children in the following manner: The term denotes not only a place of congregation, but also a certain set of working and living conditions. The vast majorities are on the street to make a living for their families and / or themselves. For these children, the street is, above all, a work place. Second, they spend large amounts of time on the street frequently because of the low returns on their labour. Third, most make their way into the informal sector as petty

hawkers, shoe-shine boys, scavengers of raw materials or even thieves and street prostitutes. Fourth, by the nature of their work and life, they are normally on their own, largely unprotected by adults. For these reasons above all others, they are vulnerable to many dangers and abuses, and they tend to receive few services essential to their protection and development. UNICEF includes all children described above in the category of "Children in Especially Difficult Circumstances" (CEDC). Based on the relationship of the child with its family, the United Kingdom Committee for UNICEF and the World Health Organization distinguished between three categories of street children, namely:

**a) Children on the Street:** This category comprises children working on the street but maintaining more or less regular ties with their families.

**b) Children of the Street:** Children in this category maintain only tenuous relations with their families, visiting them only occasionally.

**c) Abandoned Children:** Children in this category are also children of the street but are differentiated from that category (category 'b' above) by the fact that they have cut off all ties with their biological families and are completely on their own.

Malnutrition is "a man-made disease which often starts in the womb and ends in the tomb" (Elizabeth, 2004). The high level of nutritional deprivation combined with heavy burden of disease at young age has negative consequences which will be expressed during adult life. Adequate nutritional statuses is an essential requirement for children's growth and development. Malnutrition and growth failure in children are associated with increased morbidity and can affect their response to illness (Poilack *et al.*, 1985 and Pelletier, 1994). It is an invisible emergency, an iceberg whose deadly menace lies mainly hidden from the view (Prakash *et al.*, 2008).

Among the outstanding and main problems presently affecting street children in the developing countries like India, malnutrition is the most serious one. It accounts for a large amount of morbidity and mortality especially in preschool age. Undernutrition and various morbidities go hand in hand. Nutritional status is a sensitive indicator of community health and nutrition (Rao *et al.*, 2005 and Sachdev, 1995). Undernutrition is a known factor closely associated with child mortality rates (Pelletier *et al.*, 1995 and Scrimshaw *et al.*, 1968). Undernourished children have lower resistance to infection (Ray, 2005). They are more likely to die from common childhood ailments like diarrheal diseases and respiratory infections (Kielmann *et al.*, 1978).

Nutritional deficiencies have always been a major consideration in street children. The two most common deficiencies seen in children who are Iron and Vitamin D deficiencies. These deficiencies are surprisingly common and can have a significant impact on the overall health of a child. Other vitamin deficiencies are also very common. Many street children resort to using psychoactive substances (such as Tobacco, alcohol and drugs) in an attempt to escape from the overwhelming pressure of their traumatic past and their daily problems. This, in turn, can lead to medical problems due to

overdoses, an increase in the probability of accidents, violence and unprotected sex. Over time, it can lead to complications such as brain and liver damage, as also to diseases like HIV / AIDS. In view of the above, the present study was undertaken to assess PEM in street children between one to five years of age and to assess Multi-Vitamin Deficiency, Iron and Folic Acid Deficiencies, various Substance Abuse (like gutka, tobacco, alcohol) in Street children.

### Aim and Objectives

"To study the various nutritional deficiencies and substance abuse pattern in street children"

### MATERIALS AND METHODS

The present study was conducted in Department of Paediatrics, A Tertiary care referral hospital during the period August 2010 to September 2012. Street Children aged between 1 to 18 years from in and around Pimpri, Pune were included in the study. After obtaining a written informed consent the children were interviewed and demographic data such as age, sex, education and family income were recorded on a predesigned and pretested proforma. Further these children were provided with Questionnaire in Marathi / Hindi and were asked to fill the same in children who were aged more than eight years. In case if the child was less than eight years age, parents were asked to fill the same with child. In case if the child or parents were illiterate, study co-ordinator helped to fill the questionnaire.

### Inclusion Criteria

- Street children aged between 1 to 18 years.

### Exclusion Criteria

- Street Children adopted by Non-Governmental Organizations (NGOs) or Government agencies.
- Orphans adopted by Non-Governmental Organizations (NGOs) or Government agencies.

Further the children were subjected to thorough clinical examination. Clinical signs and symptoms for the multi-vitamin deficiency and substance abuse were assessed and recorded. Assessment of protein energy malnutrition was done based on WHO (Elizabeth, 2004) and IAP charts (WHO, 1997). Blood was drawn under aseptic precautions for the estimation of haemoglobin and peripheral smear and after the tests finding were noted.

### Data Analysis

The data obtained was coded and entered into Microsoft Excel Worksheet. The categorical data was expressed as rates, ratios and proportions and continuous data was expressed as mean  $\pm$  standard deviation (SD). The association of study variables was analysed by Chi-square test. A probability value ('p' value) of less than or equal to 0.05 was considered as statistically significant.

## RESULTS

The majority, 126 (61.76%) of cases were in age group 1 to 5 years followed by 31 cases in 16 to 18 years age group, 26 cases in 6 to 10 years age group and remaining 20 cases were in age group of 11 to 15 years. 111 (54.41%) of cases were males and remaining 93 cases were females.

**Table 1. Grade of PEM (IAP) wise distribution of children in 1-5 years age group**

Grade of PEM (IAP)	No. of Children	Percentage
1	18	14.29
2	25	19.84
3	23	18.25
4	60	47.62
Total	126	100

The above table shows grade of PEM wise distribution of 126 cases in study group using IAP classification. 60 (47.62%) of cases were having grade 4 PEM, followed by 25 (19.84%) cases with grade 2 PEM. 23 (18.25%) were in grade 3 PEM, maximum number of children had grade 4 PEM. On the basis of WHO classification of PEM, 61 (48.41%) of cases were wasted and stunted, followed by 35 (27.78%) cases who were stunted. 30 (23.81%) were wasted. This shows chronicity of problem in majority of cases.

**Table 2. Association between Severity of anaemia and age in study group**

Hb. (gm%)	Age yrs.		Total
	1 – 5	6 – 18	
Normal ( $\geq 12$ )	2	4	6
Mild (10 – 11.99)	50	33	83
Moderate (7 – 10)	73	41	114
Severe ( $<7$ )	1	0	1
Total	126	78	204

Chi-square = 3,  $P > 0.05$

Among the 6 cases with normal haemoglobin, 2 cases were in age group of 1 to 5 years and remaining 4 cases were in age group of 6 to 18 years. Among 114 cases with moderate anaemia, 73 cases were in age group of 1 to 5 years and 41 cases were in age group of 6 to 18 years. Maximum cases fell into the category of moderate anaemia. Among the 146 cases with microcytic hypochromic anaemia, 101 cases were in age group 1 to 5 years and remaining 45 cases were in age group of 6 to 18 years. Among 50 cases with macrocytic hypochromic anaemia, 21 cases were in age group of 1 to 5 yrs. and 29 cases were in age group of 6 to 18 years.

**Table 3. Nutritional deficiency according to grade of PEM (IAP) in 1 – 5 years age group**

Nutritional deficiency	Grade of PEM (IAP)				Chi-square	P value
	1	2	3	4		
<i>Vitamin A</i>						
Present	6	8	16	42	16.12	$<0.001$
Absent	12	17	7	18		
<i>Vitamin B</i>						
Present	7	10	16	46	15.34	$<0.001$
Absent	11	15	7	14		
<i>Vitamin C</i>						
Present	10	12	17	52	16.07	$<0.001$
Absent	8	13	6	8		
<i>Vitamin D</i>						
Present	3	1	1	0	13.44	$<0.01$
Absent	15	24	12	60		

The above table shows association between nutritional deficiency and grade of PEM (IAP) among 204 cases in study group. Vitamin A was seen in 42 cases with grade 4 PEM. Vitamin B deficiency was seen in 46 cases with grade 4 PEM. Vitamin C deficiency was seen in 52 cases with grade 4 PEM. Children with grade 4 PEM have more tendency towards vitamin deficiency.

**Table 4. Addiction wise distribution of children in study group in age group of 6 to 18 years**

Addiction	No. of Children	Percentage (n=78)
Alcohol	5	6.41
Tobacco	25	32.05
Mishri	15	19.23
Ghutaka	25	32.05
No	46	58.97

The above table shows addiction wise distribution of 78 cases in study group. The majority i.e. 46 (58.97%) of cases were without any addiction, followed by 25 (32.05%) cases with addiction of tobacco and ghutaka and 5 cases were addicted to alcohol. Among the 54 males, 19(35.18%) cases had history of substance abuse. Among 24 females, 9(37.5%) cases had history of substance abuse.

**Table 5. Nutritional deficiency according to substance abuse in 6 – 18 years age group**

Nutritional deficiency	Substance abuse		Chi-square	P value
	Yes	No		
<i>Vitamin A</i>				
Present	16	30	1.81	$>0.05$
Absent	16	16		
<i>Vitamin B</i>				
Present	22	16	8.72	$<0.001$
Absent	10	30		
<i>Vitamin C</i>				
Present	23	36	0.42	$>0.05$
Absent	9	10		
<i>Vitamin D</i>				
Present	6	12	0.57	$>0.05$
Absent	26	34		

The above table shows association between nutritional deficiency and substance abuse among 78 cases in study group in age group of 6 to 18 years. Vitamin A was seen in 16 cases with substance abuse. Vitamin B deficiency was seen in 22 cases with substance abuse. Vitamin C deficiency was seen in 23 cases with substance abuse.

## DISCUSSION

The present study was planned to study nutritional deficiency and addiction pattern among the children on street. Total 204 street children were enrolled in the study. Majority i.e. 126 children were in age group of 1 to 5 years followed by 32 cases were in age group of 16 to 18 years. Sex wise distribution showed that majority of children were males as compared to females. Grade 4 PEM was seen in majority i.e. 60 cases in study group followed by 25 cases in grade 2 PEM, 23 cases were grade 3 PEM and only 18 cases were in grade 1 PEM. This is an important finding since most of the 1 to 5 year old children in the study had grade 4 PEM which has a major implication on the growth and development of these

children affected at such a young age. 61 children were both wasted and stunted, followed by 30 cases with only wasting in study group. Similar finding was seen in a study carried out by Rita Patriasih *et al.* (2010) who analysed food habits and nutrients intake and health and nutritional status of street children. Based on the classification of nutritional status, 42.7% and 80.4% of street children were underweight and stunted, respectively. This is a crucial finding in the study since not only are the children victims of grade 4 PEM but also they are chronically malnourished. Chronicity implies that malnourishment would have definitely taken toll on their development as well, since maximum development of the brain takes place between 1 to 2 years. Anaemia in street children was not associated with age of children in the study group, which means all age groups were equally afflicted by anaemia. Neither PEM nor chronic malnutrition made a difference. This means specific attention has to be paid when providing iron prophylaxis or treatment to these children as all of them are equally affected and it is not a confined finding with malnutrition.

Vitamin A, B and C deficiency was significantly more in cases with grade 4 PEM in study group. Similar finding was observed in study carried out by Dharam Singh *et al.* (2008) who investigated the socio-cultural background, ecological factors and various problems faced by street children. Vitamin A deficiency was common in 74 (37%) cases among the street children. This is an obvious finding since Vitamin A deficiency goes hand in hand with malnutrition. Malnourishment is the result of macro and micronutrient deficiency. Addiction wise distribution among 78 cases showed that 25 cases had addiction to tobacco and ghutaka. Only 5 cases were addicted to alcohol. Similar finding was seen in a study conducted by Turkmen *et al.* (2004). Street children were subjected more frequently to child abuse, were addicted to gutakha and tobacco and were working at a remote place from their house and not getting adequate shelter. Nearly fifty percent of the children from 6 to 18 years were addicted which is a shocking fact. It means that almost fifty percent of the adolescent street children which contribute a significant proportion of the Indian children and the future working class are addicted.

This has an enormous implication since addiction takes a sharp turn on their health and social life. As age increased the chances of getting substance abuse also increased significantly in study group. Evidently, as children get bigger, their tendency to hang around away from their family, exposure to other adults outside the family, gaining knowledge about abusive substances and their sources are more likely. Sex was not associated with substance abuse in study group. Normal impression that males are most likely to be addicted has been eliminated in this study. Females and males are addicted and they showed no statistically significant difference. Females are as prone as males to succumb to addiction and if males can resort to begging and stealing for money to get the substance, females can also found to be doing the same. Among the cases with substance abuse, Vitamin B deficiency was observed significantly in study group. To add to the children in the study group, who have chronic malnutrition and multiple vitamin deficiencies, children with substance abuse are also bearers of gross vitamin

B deficiency probably due to substance abuse causing malabsorption of this vitamin. Vitamin B is a backbone of many functions in the body having cardiovascular morbidities, dementia, diarrhea and megaloblastic anaemia in the list of deficiency diseases. Their deficiency implies a lot in regard to lowering immunity, catching diseases faster and thereby halts growth and development. Substance abuse therefore should be highly discouraged since it is eating up our adolescents in their prime time of life, pushing them towards illegal activities, having a toll on their reproductive life and hitting on their health and vitamin profile. The problem of malnutrition further worsens due to the direct and indirect effects of alcohol and other drugs which lead to many adverse effects on health and safety risks for the child, family and community.

### Summary and Conclusion

Majority of the children were in age group of 1 to 5 years followed by age group of 16 to 18 years. Sex wise distribution showed that majority of children were males as compared to females. Grade 4 PEM was seen in 60 cases in study group followed by 25 cases in grade 2 PEM, 23 cases with grade 3 PEM and only 18 cases were in grade 1 PEM. This fact needs to be evaluated and corrective measures has to be taken. This study has revealed that protein energy malnutrition is more common in 1 to 5 years of age the most vulnerable period of life for malnutrition. Both sexes being equally affected. 61 children were both wasted and stunted, followed by 30 cases with only wasting in study group. This indicates chronic malnutrition. Anaemia in street children was not associated with age of those children in study group, which means all age groups were equally afflicted by anaemia. Vitamin A, B and C deficiency was significantly more in cases with grade 4 PEM in study group. Addiction wise distribution among 78 cases showed that 25 cases had addiction to tobacco and ghutaka. Only 5 cases were addicted to alcohol. 50% addictions in street children is highly significant. This is because the fact that these children were exposed to substance abuse. As age increased the chances of getting substance abuse also increased significantly in study group. Among the cases with substance abuse, Vitamin B deficiency was observed significantly in study group.

Malnutrition is a major problem in children under 5 years of age. Severe malnutrition was noted equally in both sexes. Improper diet is a prominent cause of malnutrition in street children. As the grade of PEM increases, multi-vitamin deficiency is seen more. Anaemia and vitamin (predominantly A and B) are striking features in children with severe malnutrition. Most street children with severe PEM present with danger signals and threats for life. Drug addiction is a major issue in street children, nearly fifty percent of the children from 6 to 18 years were addicted which is a shocking fact. This has an enormous implication since addiction is very hard to break free from if proper withdrawal assistance is not sought. Having an unstable social life has a negative impact on the others that are dependent on them for financial backup. This unfortunately again fuels the vicious cycle and their young ones would also grow up seeing the same. The importance of this study is that these children on street represents the most neglected strata of society since it is observed in the study that grade 4 PEM is most common in

age group of 1 to 5 years, special efforts should be directed on diet of these children. Therefore diet rich in multivitamins and iron rich food should be provided. Special efforts have to be taken to reduce substance abuse in adolescent children and counselling of these children should be done aggressively so that these children have healthier future ahead.

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**Conflict of Interest:** None

### REFERENCES

- Kumari, S. 2005. Assessment of nutritional status of school children from rural Bihar, *Indian J Nutr Diet*; 42:326.
- Elizabeth, KE. 2004. Nutrition and Child Development. 4<sup>th</sup> ed., Hyderabad: Paras Publications.
- Poillack, MM., Ruttimann, UE. and Wiley, JS. 1985. Nutritional depletions in critically ill children: associations with physiologic instability and increased quantity of care. *JPEN J Parenter Enteral Nutr*; 9:309-13.
- Pelletier, DL. 1994. The relationship between child anthropometry and mortality in developing countries: implications for policy, programs and future research. *J Nutr*; 124:2047S-80S.
- Prakash, KL., Nair, V. and Vishnu Bhat, B. 2008. Spectrum of PEM 1<sup>st</sup>ed. New Delhi: Jaypee Brother.
- Rao, VG., Yadav, R., Dolla, CK., Kumar, S., Bhondeley, MK. and Ukey, M. 2005. Undernutrition and childhood morbidities among tribal preschool children. *Indian Med Res.*; 122(1):43-7.
- Sachdev, HPS. 1995. Assessing child malnutrition – some basic issues. *Bull Nutr Foundations India*; 16:1-5.
- Pelletier, DL., Frongilio, EA., Schroeder, DG. and Habicht, JP. 1995. The effects of malnutrition on mortality in developing countries. *Bull World Health Organ*; 73:443-8.
- Scrimshaw, NS., Taylor, CE. and Gordon, JE. 1968. Interactions of nutrition and infection. WHO Monograph Series 57. Geneva: World Health Organization.
- Ray, SK. 2005. Action for tackling malnutrition: Growth Monitoring or Surveillance? *Indian J Public Health*; 49(4):214-7.
- Kielmann, AA., Taylor, CE. and Parker, RL. 1978. The Narangwal Nutrition Study: A summary review. *Am J Clin Nutr*; 31:2040-52.
- Elizabeth, KE. 2004. Applied nutrition. In: Nutrition and Child Development. 3<sup>rd</sup> ed., Hyderabad: Paras Publications. p.146.
- WHO, 1997. Global Database on Child Growth and Malnutrition (Document WHO/NUT/97.4). Geneva: World Health Organization.
- Rita Patriasih, IsmaWidiaty, Mira Dewi and Dadang Sukandar, 2010. Nutrients Intake and Nutritional Status of Street Children In Bandung. *Journal of Nutrition and Food*, 5(3): 178-184.
- Dharam Singh, Nishtha Sareen, Abhishek Ojha and Devendra Sareen, 2008. Street Children of Udaipur: Demographic Profile and Future Prospects. *Stud Tribes Tribals*; 6(2): 135-139.
- Turkmen, M., Okyay, P., Ata, O. and Okuyanoglu, S. 2004. A descriptive study on street children living in a southern city of Turkey. *Turk J Pediatr.*; 46(2):131-6.

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