Original Research Paper Community Medicine

ASSESSMENT OF MALNUTRITION AND ASSOCIATED RISK FACTORS AMONG 1-5 YEARS CHILDREN IN URBAN SLUMS OF CENTRAL INDIA

Dr. Vivek Nagar	Designation-Senior resident, Department of community and family medicine, All India Institute of Medical Science, Bhopal
Dr. Sarad Tiwari	Designation- Medical officer, District hospital , Bhopal
Dr. Mohan Shinde	Designation – Professor, Department of Community Medicine , Gandhi Medical College, Bhopal
Abhishek Sahai	Designation – Project coordinator, RISS UNICEF, Bhopal

ABSTRACT Under nutrition is a major cause in more than half of under-five death In India; around 43% of under five children's were underweight.

Objective- To study the malnutrition/ under nutrition and its associated factors amongst children's (1-5 years) in urban slums of Bhopal city.

Methodology- This study was a cross sectional study conducted in two slum areas of Bhopal from July 2014 to December 2014. Study population comprises all the children from 1year to 5 year of age.

Result- Total 300 subjects enrolled for this study. Overall prevalence of malnutrition was 26%. Prevalence of Malnutrition was higher in children of 1-3 years, female sex, nuclear family, and children having ≥3 siblings, illiterate father, and lower socioeconomic status.

Conclusion- The current study is focused on assessment of epidemiological dynamics of the malnutrition in the urban slum of the Bhopal city with emphasis on early screening of malnutrition in slum areas.

KEYWORDS : Malnutrition, slums, children

Introduction - Child growth and health is recognized as an important public health indicator for monitoring of nutritional status and health in a population. 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, diarrheal diseases, preterm birth complications, birth asphyxia and malaria. under nutrition is a major cause in more than half of under-five death(Faijer, Bay, & Miller, 2011). Malnutrition is a silent Emergency and causes more than half of under-five deaths in Asia, maximum number of under-nutrition is in South East Asian region that includes India. Globally children who are poorly nourished suffer up to 160 days of illness each year. (WHO, Geneva 2000)(Faijer et al., 2011)(WHO/ NHD/ 2000). Worldwide an estimated 101 million children under-five years of age, or 16%, were underweight (i.e., weight-for-age below –2SD) in 2011 — a 36% decrease from an estimated 159 million in 1990 (Bank et al., 2012). 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 (India, 2005). Malnutrition in childhood has serious, long-term consequences because during this phase of life motor, sensory, cognitive, social and emotional developments occur. In order to solve the problem of underweight, it is necessary to measure its correct burden and understand its risk factors. In this context present study was conducted to study the Malnutrition/under nutrition and its associated factors among children (1-5 years) in Urban slums of Bhopal city.

Methodology-This study was a community based cross sectional study conducted in two nearby slum areas namely shaheed nagar and shajida nagar which are located within the field practice area of Urban Health and Training Center (UHTC) of Department of Community Medicine of Gandhi Medical College Bhopal from July 2014 to December 2014. Study population comprises all the children from 1year to 5 year of age. Sample size for the study was obtained using simple random sampling method formula $4PQ/L^2$; assuming prevalence of malnutrition 60 % in under 5 children in Madhya Pradesh state with 95% confidence interval and 10% of relative precision.

Accordingly the sample came out to be approximately 300 children who were interviewed by using a semi-structured and pretested proforma which contain basic section of questionnaire regarding detailed socio demographic profile like age, sex, economic status of family, education level of mother and father, housing and environment and sanitation condition etc. Other sections include information related with physical examination, anthropometric measurements including height & weight and classification of malnutrition done using Gomez classification.

Result- Total 300 subjects enrolled for this study 139 from Shajida nagar and 161 from Shaheed nagar out of which 187 were males and 113 were females. Overall prevalence of malnutrition was 26%. Table no.1 shows the distribution of malnutrition in two different slum areas. In Shajida nagar 32.3 % and in Shaheed nagar 20.4% children suffer from malnutrition. Mild, moderate and severe malnutrition done according to weight for age of the children, severe malnutrition more in shajida nagar(4.3%) as compare to shahid nagar(1.86%). Table no.2 shows the different variables and category of malnutrition and shows the children of age group 1-2 years were significantly more malnourished as compared to 2-6 years of age. Girls(31.8%) child were more malnourished than male child(22.4%) and prevalence of malnutrition higher among children of >3 sibling(28.3%) compare to children with 1-2 siblings (23.6%), Children of nuclear family significantly more malnourished as compare to nuclear family children ($p<0.05$). Majority (29.2%) of the children of illiterate mother were malnourished as compared to children (25.1%) of literate mother but an insignificant ($p=0.52$) association was found between the prevalence of Malnutrition in children and their mother's literacy whereas a significant ($p<0.005$) association was found between malnutrition in children and their father's educational level and it was observed that 56.5% children were affected with Malnutrition whose father's educational level was illiterate. In the present study, children belonging to lower socio-economic class were poorly nourished in comparison to those belong to upper socio-economic class ($p=0.009$).

Table No.1 Distribution of malnutrition according to two different slum areas

Area	Total Children Examined	Total Malnourished Children	Mild / 1st Degree Malnourished	Moderate / 2nd Degree Malnourished	Severe/ 3rd Degree Malnourished
Shaheed nagar	161	33(20.4%)	21(13.0%)	9(5.5%)	3(1.86%)
Shajida nagar	139	45(32.3%)	27(19.4%)	12(8.6%)	6(4.3%)
Total	300	78(26.0%)	48(16.0%)	21(7.00%)	9(3.0%)

Table No.2 Distribution of malnutrition according to different variables.

Variables (n)	Mild / 1st Degree Malnourished	Moderate / 2nd Degree Malnourished	Severe/ 3rd Degree Malnourished	Total
Gender Male(187) Female(113)	27(14.4) 21(18.5)	11(5.8) 10(8.8)	4(2.1) 5(4.4)	42(22.4) 36(31.8)
Age Group 6-24 months(112) 25-60 months(188)	15(13.3) 33(17.5)	9(8.0) 12(6.3)	9(8.0) 0(0.0)	33(29.4) 45(23.9)
No. of Siblings 1 - 2 (152) ≥3 (148)	15(9.8) 33(22.2)	19(12.5) 2(1.3)	2(1.3) 7(4.7)	36(23.6) 42(28.3)
Education level of mother Illiterate(65) Primary(90) Middle(63) High school(55) Higher secondary and graduates(27)	9(13.8) 12(13.3) 14(22.2) 6(10.9) 3(11.1)	5(7.6) 6(6.6) 9(14.2) 3(5.4) 0(0.0)	5(7.6) 6(6.6) 0(0.0) 0(0.0) 0(0.0)	19(29.2) 24(26.6) 23(36.5) 9(16.3) 3(11.1)
Education level of Father Illiterate(23) Primary(34) Middle(58) High school(112) Higher secondary and graduates(73)	4(17.3) 9(26.4) 19(36.2) 6(5.3) 9(12.3)	4(17.3) 3(8.8) 9(15.5) 6(5.3) 3(4.1)	5(21.7) 3(8.8) 0(0.0) 6(5.3) 0(0.0)	13(56.5) 15(44.1) 30(51.7) 18(16.0) 12(16.4)
Socio economic status Lower(84) Upper lower(52) lower middle(145) Upper middle (12) Upper(7)	24(28.5) 15(28.8) 9(6.2) 0(0.0) 0(0.0)	9(10.7) 6(11.5) 6(6.2) 0(0.0) 0(0.0)	9(10.7) 0(0.) 0(0.0) 0(0.0) 0(0.0)	42(50) 21(40.3) 15(10.3) 0(0.0) 0(0.0)
Type of Family Joint (132) Nuclear (168)	9(6.8) 24(14.2)	6(4.5) 15(8.9)	2(1.5) 7(4.1)	17(12.8) 46(27.3)

Discussion-Assessment of nutritional status of children provides an important facet of the overall health of society and development of the country. The foundation of healthy life is laid during early childhood period with lifelong implication if not treated and rehabilitated.

Socio-demographic variables like age, gender, socio-economic status etc are associated with undernourishment (Faijer et al., 2011)(India, 2005). The current study is focused on assessment of epidemiological dynamics of the of protein energy malnutrition prevailing in the urban slum population of the Bhopal city. 300 children were assessed using a semi-structured and pretested proforma including assessment of malnutrition using Gomez classification and other variables.

In this study, out of the total 300 children 26% were found to be malnourished similar result were reported by some previous studies. According to a study done by H Ullah et al 2014 (Ullah et al., 2014) A total of 186 children were studied to identify malnutrition, out of 186 children, 19 (7.1%) were victims of malnutrition. 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 (Naandi Foundation, 2011).

In the present study Females were more malnourished than males, similarly study done by Stalin P et al. (2013) among 563 under five children in rural Tamil Nadu, found a significant association between malnutrition and sex of children with prevalence of underweight, 62.6% and 44% among female and male children, respectively.(Stalin et al., 2013)

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 socioeconomic status was similar to the findings of previous studies (Faijer et al., 2011)(SUTANU DUTTA CHOWDHURY, 2008).

Nearly three fourth of children of 1-3 years age group were malnourished which is similar to finding of a study done by (Chakraborty, Gupta, Chaturvedi, & Chakraborty, 2006) in rural Jhansi who observed that malnutrition was significantly (p=<0.05) more prevalent in the younger age (1-3 yrs) group children (80.9%). Children belonging to nuclear family were more affected with PEM than the joint family which is similar to findings of Singh et al. (2012)(Singh, Bhatnagar, Singh, Garg, & Chopra, 2012) that reported 63.8% and 52.9% children of nuclear and joint family were malnourished, respectively.

The prevalence of PEM was found to be higher in those children who have ≥3 siblings compare to children with 1-2 siblings which is in

accordance with findings of Sengupta et al. (2010)(Sengupta, Philip, & Benjamin, 2010),and Bhavsar et al. (2012)(Bhavsar, Hemant, & Kulkarni, 2012), that reported majority of children, 51.7% and 67.2% were malnourished who have ≥3 siblings, respectively.

Present study finds that children of illiterate mother were found to be more malnutrition as compared to children of literate mother. Similar result that the prevalence of PEM among children decreased with increasing mother's literacy was reported by NFHS-III (2005-06)(India, 2005) and Singh et al. (2012)(Singh et al., 2012).

Parental illiteracy was significantly associated with the risk to develop malnutrition in children under the age of five. Bantamen G et al (Bantamen, Belaynew, & Dube, 2014).

Prevalence of PEM in children was also found to be significantly higher whose father's educational level was illiterate. A study done by Bhavsar et al. (2012)(Bhavsar et al., 2012) in Mumbai urban slum also revealed that nearly two third children under six of illiterate/primary school father were malnourished .

It was observed that the socio economic status of the family signifies the nutritional status of the children. A study done by Stalin P et al (2013)(Stalin et al., 2013) in rural Kancheepuram, Tamil Nadu found that nearly two third (63.4%) and half (47.2%) children in category IV and V were significantly ($p<0.05$) malnourished, respectively whereas in another study by Bhavsar et al. (2012)(Bhavsar et al., 2012) observed that most (80.2%) of children belonging to lower class (IV+V) were significantly malnourished.

Conclusion and recommendations- The present study shows that 26% of children (1-5 years) were underweight and prevalence of Malnutrition was higher in children of 1-3 years of age group, female sex, children having ≥3 siblings, illiteracy, lower socioeconomic status. Therefore, the primary targets are to screen the malnutrition in early phase so intervention can be taken as early as possible. Strengthening of services can be achieved by the help of Accredited Social Health Activist (ASHA), Aganwadi Worker (AWW), Auxillary Nurse Midwife (ANM) increased community mobilization & participation with high priority to female children and children of large family size. The extent of malnutrition can be countered by educating the parents with respect to basic nutritional requirements of their children and encouraging them to consume locally available low cost foods.

References:-

1. Bank, U. W., Wardlaw, T., Newby, H., Brown, D., Cai, X., Onis, M. De, … Hiraga, M. (2012). Child, Malnutrition. Retrieved from http://www.who.int/nutgrowthdb/jme_unicef_who_wb.pdf
2. Bantamen, G., Belaynew, W., & Dube, J. (2014). Nutrition & Food Assessment of Factors Associated with Malnutrition among Under Five Years Age Children at Machakel Woreda , Northwest Ethiopia : A Case Control Study. Nutrition & Food Sciences, 4(1), 1–7. https://doi.org/10.4172/2155-9600.1000256
3. Bhavsar, S., Hemant, M., & Kulkarni, R. (2012). Maternal and Environmental Factors Affecting the Nutritional Status of Children in Mumbai Urban Slum. International Journal of Scientific and Research Publications, 2(11), 1–9.
4. Chakraborty, S., Gupta, S. B., Chaturvedi, B., & Chakraborty, S. K. (2006). A Study of Protein Energy Malnutrition (PEM) in Children (0 to 6 Year) in a Rural Population of Jhansi District (U . P .). Indian Journal of Community Medicine, 31(4), 291–292.
5. Faijer, D. J., Bay, G., & Miller, T. (2011). Levels & Trends in Child Mortality Report. Retrieved from http://www.childmortality.org/files_v20/download/Levels and Trends in Child Mortality Report 2011.pdf
6. India, M. of H. and F. W. G. of I. (2005). National Family Health Survey (NFHS-3) (Vol. I). Retrieved from http://dhsprogram.com/pubs/pdf/frind3/frind3-vol1andvol2.pdf
7. Naandi Foundation. (2011). HUNGaMA: Fighting Hunger & Malnutrition. Retrieved from https://www.cse.iitb.ac.in/~sohoni/TD604/HungamaBKDec11LR.pdf
8. Sengupta, P., Philip, N., & Benjamin, A. I. (2010). EPIDEMIOLOGICAL CORRELATES OF UNDER-NUTRITION IN UNDER-5 YEARS CHILDREN IN AN URBAN SLUM OF LUDHIANA. Health and Population: Perspectives and Issues Vol., 33(1), 1–9.
9. Singh, A. K., Bhatnagar, M., Singh, J. V, Garg, S. K., & Chopra, H. (2012). Socio-Demographic Determinants of Malnutrition among Children of 1-6 Years of Age in Rural Meerut. Journal of Dental and Medical Sciences, 3(3), 37–40.
10. Stalin, P., Bazroy, J., Dimri, D., Singh, Z., Senthilvel, V., & Sathyanarayanan, S. (2013). Prevalence of Underweight and its Risk Factors among Under Five Children in a Rural Area of Kancheepuram District in Tamil Nadu , India. Journal of Dental and Medical Sciences, 3(6), 71–74.
11. SUTANU DUTTA CHOWDHURY, T. C. A. T. G. (2008). Prevalence of undernutrition in Santal children of Puruliya District , West Bengal. INDIAN PEDIATRICS, 45(April 2017).
12. Ullah, H., Ullah, B., Karim, S., Tariq, I., Khan, A. K., Mir, S., … Murtaza, G. (2014). Malnutrition amongst Under-Five Years Children in Swat , Pakistan : Prevalence and Risk Factors. Tropical Journal of Pharmaceutical Research August, 13(August), 1367–1370.
13. WHO/NHD/. (2000). Turning the tide of Malnutrition. Retrieved from http://apps.who.int/iris/bitstream/10665/66505/1/WHO_NHD_00.7.pdf