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Research Article

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Chronic undernutrition amongst under-five in an urban slum of Central India

Rajeshree S. Dhok*, Subhash B. Thakre

Department of Community Medicine, Government Medical College, Nagpur, Maharashtra, India

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*Correspondence: Dr. Rajeshree S. Dhok,

E-mail: rajeshree.dhok@gmail.com

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ABSTRACT

Background: Malnutrition is a major public health problem in India. Chronic undernutrition - stunting is one of the major causes of morbidity and mortality among under-five children. It continues to be a growing problem in most developing countries. Present study was planned to estimate prevalence of stunting (chronic undernutrition) and its determinants amongst under-five children in an urban slum of central India.

Methods: This community based cross-sectional study was conducted in an urban slum area of Nagpur, India. Study subjects were under five children residing in the slum. Data collection was done by conducting house to house survey and information was recorded in pre-designed pre-tested survey tool. Height was measured with standard techniques and classified as stunting according to WHO child growth standards 2006.

Results: The overall prevalence of stunting amongst under five children in urban slum area was found to be 34.77%. Determinants found to be significantly (P<0.05) associated with stunting were lower socio-economic status, illiteracy of mother, working status of mother, separated marital status of mother, not exclusively breastfed for 6 months, duration of breastfeeding <2 years, immunization not appropriate for age.

Conclusions: Stunting still continues to exists as problem among under five children of urban slum. Efforts need to be directed towards maternal education, promotion of optimal infant & young child feeding practices and immunisation as these factors are significantly associated with stunting.

Keywords: Chronic undernutrition, Determinants, Under five, Urban slum

INTRODUCTION

Childhood malnutrition is a global public health problem with serious consequences for both individual and society. Eighty percent of the world's undernourished children live in 20 countries, with India being home to nearly 60 million children who are underweight. In India, almost half of children under five years of age (48%) are stunted and 43% are underweight. Malnutrition is a major public health problem in India. Poor nutrition during childhood is one important factor impeding the physical and mental development of children, which ultimately propagates the vicious cycle of intergenerational malnutrition. This issue is critical

because its effects are not limited to the boundary of childhood but rather persist into adulthood. It silently destroys the future productivity of nations.³ Adequate nutrition is essential for achieving millennium development goal (MDG) 1, which is to eradicate extreme poverty and hunger, as well as MDGs 4 and 5, which are to reduce child mortality and improve maternal health.⁴

In any community, under five children are one of the most vulnerable groups for nutritional deficiencies, owing to many factors ranging from low birth weight to maternal ill health to socioeconomic and environmental factors. ⁵ Chronic undernutrition i.e. stunting, is one of the

major causes of morbidity and mortality among underfive children and it continues to be a growing problem in most developing countries. Studying stunting is important as it reflects the cumulative effects of socioeconomic, health and nutritional problems.³

It is projected that more than half of the Indian population will live in urban areas by 2020 and nearly one third of this urban population will be of slum dwellers. The growth and development of the slum children is compromised due to poverty and low social status because of their mobility, lack of public services and poor sanitation. This study was planned to estimate prevalence of stunting (chronic under nutrition) amongst under-five children in an urban slum of central India and to study some determinants of stunting amongst them.

METHODS

This community based cross-sectional study was conducted among under five children residing in an urban slum area of central India during November 2013 to May 2014. Approval from the institutional ethics committee was sought prior to the start of the study. The notified urban slum was selected purposively for feasibility reasons as it is urban field practice area of study institution. Sample size estimation was based on the prevalence of stunting (44%) found in NFHS-3.² It was calculated as 226 however, all 256 under five children residing in the slum were included in the study. Data collection was done by conducting house to house survey with help of the anganwadi worker to seek cooperation from the respondents. It was decided to pay three informed visits to include all under five children in a family; however after three informed consecutive visits at convenient time if study subject could not be contacted for examination then those were to be excluded from the final analysis of the study participants. The timing of the study was adjusted to suit the convenience of the study subjects, and ensure their availability in their home. Purpose of the study was explained to the parents/ guardians of the study subjects and due consent was taken prior to the start of the study. Information was collected by interview technique, using predesigned and pretested survey tool. The respondents were the mothers of the under five children. The structured questionnaire covered information on socio demographic variables, infant and young child feeding practices and immunization status of study subjects. Anthropometric measurement i.e. height were taken as per WHO standard techniques.⁷ Height was measured against a non stretchable tape fixed to a vertical wall, with the study subject standing on a firm/level surface and it was measured to the nearest 0.5 cm. The child was made to stand against a wall with bare feet slightly apart, the heel, calf, buttock, shoulder blades and the back of the head touching the wall and the child looking straight ahead. The head was so positioned that a horizontal line from the ear canal to the lower border of the eye socket runs parallel to the firm / level surface. A firm wooden scale

was placed horizontally pressing the head to mark the point indicating the height. Recumbent length (for children less than 24 months of age) was measured by using an infantometer. The child was laid on his/her back with head against the fixed headboard in such a way that an imaginary vertical line from the ear canal to the lower border of the eye socket is perpendicular to the board. While applying gentle pressure on the knees to straighten the legs, the footboard was pulled against the child's feet. The measurement was recorded to the nearest 0.5 cm. The median height-for-age of the WHO Growth Standards were used as the reference anthropometric indices for this study.⁸ Simplified field tables of WHO child growth standards for 0-5 years were used. Stunted was defined as height for age <2 SD below the median height-for-age. Study subjects requiring immediate health care/attention were referred to the pediatric department of parent institution.

Descriptive statistics (percentage, mean, standard deviation (SD) and range) were used to summarize baseline characteristics of the study subjects. Association between two categorical variables was analyzed by using odds ratio along with 95% confidence interval (CI). Data was analyzed using Epi-info 7 and STATA 10.1 statistical software. P value <0.05 was considered to be statistically significant.

RESULTS

The study sample comprised of 256 under five children from purposively selected slum of Nagpur city of Central India, out of which 144 (56.25%) were male and 112 (43.75%) were female. The overall prevalence of chronic under nutrition i.e. stunting was found to be 34.77%. Among 256 study subjects, majority were Hindu 146 (57.03%), followed by Bouddha 90 (35.16%) and Muslim ten (3.91%), six (2.34%) Christian and four (1.56%) Sikh study subjects. According to modified Kuppuswamy socioeconomic status scale, maximum study subjects i.e. 200 (78.13%) were from upper lower and lower socioeconomic class while 56 (21.87%) belonged to lower middle socio-economic class. Literacy rate among mothers was 91.80%. It was observed that mothers of majority i.e. 242 (94.53%) study subjects were currently married; whereas 14 (5.47%) study subjects had their parents separated.

Figure 1 shows that proportion of male study subjects was more (84%) when it was compared with female (16%) in age group of 7-12 months. However, proportion of female study subjects was more (59.52%) as compared to males (40.48%) in age group of 37-48 months. Mean±SD age of study subject was (29.42±16.29) months and the range was 1-58 months.

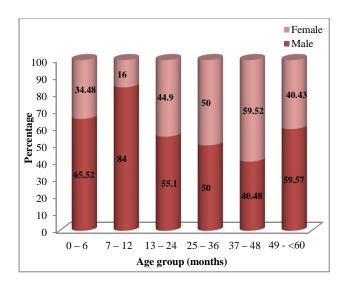


Figure 1: Age and gender wise distribution of study subjects.

Table 1 shows higher proportion of female stunting i.e. 36.61% than males (33.33%) but the difference was not statistically significant (P = 0.586). Lower socioeconomic status was significantly associated with higher prevalence of stunting (P<0.001). Statistically significant association was found between educational status of mother and prevalence of stunting (P = 0.02). Out of the 21 study subjects who had illiterate mothers, 57.14% showed stunting whereas 32.76% of the study subjects showed stunting whose mothers were literate. Prevalence of stunting was found higher (45.90%) among the study subjects whose mothers were working as compared to the prevalence of stunting (31.28%) in study subjects whose mothers were not working. 64.29% of the study subjects. Considering marital status of the mother, prevalence of stunting (64.29%) among study subjects whose parents were separated was higher than prevalence of stunting (33.06%) among those study subjects whose parents were currently married. Mother's marital status was found to be significantly associated with stunting (P = 0.017).

Table 1: Determinants of stunting (Bivariate analysis).

Variables (n)	Normal n=167 (%)	Stunted n = 89 (%)	Odds ratio	(95% CI)	P value
Gender					
Female (112)	71 (63.39)	41 (36.61)	1.16	(0.68 - 1.93)	0.586
Male (144)	96 (66.67)	48 (33.33)			
Socio-economic status					
Lower (200)	115 (57.50)	85 (42.50)	9.61	(3.35 - 27.59)	< 0.001
Middle (56)	52 (92.85)	4 (7.14)			
Mother's educational status				(1.11 - 6.77)	0.02
Illiterate (21)	9 (42.86)	12 (57.14)	2.74		
Literate (235)	158 (67.23)	77 (32.76)			
Mother's occupational statu	S			(1.04 - 3.35)	0.036
Working (61)	33 (54.09)	28 (45.90)	1.83		
Non-working (195)	134 (68.72)	61 (31.28)			
Marital Status					
Separated (14)	5 (35.71)	9 (64.29)	3.65	(1.18 - 11.23)	0.017
Currently married (242)	162 (66.94)	80 (33.06)			
Exclusive breastfeeding for 6 months (n = 227)					
No (50)	23 (46.00)	27 (54.00)	2.41	(1.27 - 4.56)	0.006
Yes (177)	119 (67.23)	58 (32.77)			
Duration of breastfeeding (n=181)					
<2 years (139)	75 (53.96)	64 (46.04)	3.13	(1.39 - 7.03)	0.004
≥2 years (42)	33 (78.57)	9 (21.43)			
Immunization status					
Not appropriate for age (40)	17 (42.50)	23 (57.50)	3.07	(1.54 - 6.13)	0.001
Appropriate for age (216)	150 (69.44)	66 (30.56)			

The study subjects who were exclusively breastfed for 6 months showed lower prevalence of stunting 58 (32.77%) as compared to prevalence of stunting 27 (54.00%) among those who were not exclusively breastfed for 6 months. Study subjects less than 6 months of age were excluded from this analysis. Being not exclusively breastfed for <6 months was significantly associated with

stunting (P<0.001). Duration of breastfeeding <2 years was found to be significantly associated with stunting (P = 0.004). Out of 139 study subjects who were breastfed for less than two years, 46.04% were stunted whereas 21.43% of the study subjects were stunted who were continued with breastfeeding beyond two years.

Among 216 study subjects, who had immunization appropriate for age, 66 (30.56%) were stunted. Prevalence of stunting 23 (57.50%) was higher among the study subjects who had immunization not appropriate for age. Immunization not appropriate for age was found to be significantly associated with stunting 0.001). Variables found to be significantly associated with stunting were lower socio-economic status, illiteracy of mother, working status of mother, separated marital status of mother, not exclusively breastfed for 6 months, duration of breastfeeding <2 years, immunization not appropriate for age. Strength of association was highest with lower socio-economic status (OR 9.61, 95% CI 3.35 - 27.59) and lowest with working status of mother (OR 1.83, 95% CI 1.04 – 3.35).

DISCUSSION

Prevalence of stunting was found to be 34.77% in this study. Nayak RK et al (38.2%), Islam S et al (30.4%), Sapkota VP et al (37%) reported similar prevalence of stunting. 10-12 But it differed from prevalence of stunting in Maharashtra (44%) according to NFHS-3.2 Stunting being an indicator of chronic malnutrition, it is a result of prolonged food deprivation and/or illness. Females had higher prevalence of stunting (36.61%) as compared to prevalence of stunting (33.33%) in males but the gender difference was not statistically significant. Higher proportions of female were found to be stunted which confirms to the findings of other researchers. 13-15 The higher prevalence of stunting among females may be a reflection of neglect of the female child. In this study, it was found that lower socio-economic status was significantly associated with stunting (P<0.001). This finding shows consistency with findings of other studies conducted by Avachat SS et al, Luthra M et al, Kumar D et al. 13,15,16 As the socioeconomic status of the family deteriorates, illiteracy, gender and other social issues becomes more potent and also these factors act synergistically to put the child vulnerable to under nutrition. Also, educational status of mother showed significant association with stunting (P = 0.041). Literate mothers seem to be more aware about child care, child feeding practices, recognizing illnesses and seeking treatment for their ill children. In present study, higher prevalence of stunting was found among the study subjects of mothers who were working as compared to homemakers, the difference was statistically significant (P = 0.036). Mittal A et al, Manjunath R et al found no significant association between working status of mother and under nutrition. 17,18 As working mothers stay away from home for considerable time period, lack of attention towards child's feeding practices may affect nutritional status of children. Current study has revealed that mother's marital status was found to be significantly associated with stunting (P = 0.017). All the children with separated parents were living with their mothers in this study. Majority of the separated mothers were from lower socio-economic status which made them face dual burden of being the economic backbone as well as a sole parent

for the child. This dual burden affects the availability of time a single mother can spend in child care.

It is evident from the study findings that high rate of exclusive breastfeeding for six months i.e. 177 (77.97%) was reported among the study subjects. The study subjects who did not receive exclusive breastfeeding for 6 months showed significantly higher proportion of stunting (P 0.006). Sengupta P et al, Luthra M et al, Bhavsar S et al corroborate with findings of this study. 14,15,19 This result support the recommendations of exclusive breastfeeding for 6 months. Duration of breastfeeding <2 years was significantly associated with stunting (P = 0.004).

CONCLUSION

Chronic under nutrition still continues to be a problem among under five children in urban slum. As evident from the study findings, mother's literacy status, breastfeeding practices, immunisation status of children are significant determinants of chronic under nutrition amongst children, efforts need to be directed towards maternal education, promotion of optimal infant & young child feeding practices and immunisation.

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