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Research Article

Study of etiological determinants of undernutrition in undernourished children from Anganwadi

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ABSTRACT

Background: Undernutrition is important childhood health problem especially in developing countries, closely related to childhood mortality and morbidity. It is multifactorial in origin. These determinants operate at different levels. Immediate causes operating at the individual level, underlying causes influencing households and communities and basic causes at society and policy makers level. In practice these determinants overlap considerably. Exact contribution of each determinant is difficult to assess. However knowledge of locally prevalent factors helps to fine tune interventional strategies.
Methods: A prospective observational study was conducted in 100 consecutive undernourished children in the age group of 0-6 years, referred from Anganwadi center to tertiary care center. They were assessed for determinants of undernutrition. Determinants of undernutrition were categorized as per UNICEF conceptual framework of undernutrition.
Results: Immediate determinants like Low birth weight, inadequate nutrition were significantly affected. Underlying determinants like quality and quantity of food, availability, access and utilization of health services, safe water supply and environmental sanitation, breastfeeding and complementary feeding, cultural taboos regarding food and health had remarkable association with undernutrition. Basic determinants like Women empowerment, maternal malnutrition and familial educational level were adversely affected. However determinants like food availability, access to food and socioeconomic status were satisfactory.
Conclusions: Determinants of undernutrition in all three categories were differentially affected. Search for locally relevant determinants of undernutrition will be helpful to target intervention measures.

Keywords: Undernutrition, Determinants, Anganwadi

INTRODUCTION

Around 25% of world's children suffer from significant Protein Energy Malnutrition.[1] India is home to over 1/3rd of world's malnourished children. 65% i.e. nearly 80 million children under five years of age suffer from varying degrees of malnutrition.[2] According to National Family Health Survey 3 (NFHS-3) 2006 of India prevalence of 48% stunting, 43% underweight, 20% wasting has been reported in under five children. There are regional variations in prevalence of malnutrition, highest in Madhya Pradesh (55%) and the lowest in Kerala (27%).[3] An underweight child has a weight-for-age z-score that is at least 2 SD below the median for the WHO Child Growth Standards. This condition can result from either chronic or acute malnutrition, or both. Underweight status is a composite index of chronic or acute malnutrition. Underweight is often used as a basic indicator of the status of a population's health. Malnutrition contributes to 54% under five mortality; severe malnutrition 11%, mild to moderate malnutrition 43%.[4]

'Malnutrition is primarily a matter of inadequate food intake' is a myth. Malnutrition has multifactorial etiology. Hence among the various interventional strategies, single point interventions like nutritional supplementation and primary health care have failed to deliver the desired outcome.[2,5,6] Considering regional variations in these multiple underlying causes of undernutrition, impact of these factors in childhood malnutrition is likely to vary. In practice there is considerable overlap in causes of undernutrition. It is not always easy to determine the exact contribution of different underlying causes. However assessment helps to prioritize which underlying causes to address.[7,16]

Anganwadi is community based centre under Integrated Child Developmental Services (ICDS) scheme providing nutrition and health services to women in reproductive age and children in 0-6 year along with pre-school activities for children age 3-5 year.[8] Even then undernourished children are found in these centers. Determinants of malnutrition are going to vary regionally depending upon variations in locally prevalent child care practices, maternal education, availability assess and utilization of health services, antenatal care. Hence this study was conducted to find out locally prevalent relevant determinants so that interventional strategies for prevention & treatment of undernutrition can be directed towards underlying causes.

METHODS

UNICEF has designed conceptual framework which identifies three levels of causes of undernutrition. Immediate causes operating at the individual level, underlying causes influencing households and communities and basic causes around the structure and processes of societies.[7,9,10] For this study this UNICEF model was adopted and various determinants of undernutrition were categorized accordingly.

A prospective observational study of 100 consecutive undernourished children (M-48, F-52) in the age group of 0-6 year attending Anganwadi area in Kolhapur city, a district headquarter in western Maharashtra State of India was under taken. These children were referred to tertiary care centre for further evaluation. Study was conducted from January 2014 to April 2014. Parents of these children were interviewed in detail as per questionnaire designed to include all determinants as per UNICEF conceptual framework. Detail physical examination was done. Children with obvious physical and mental disability were not included in study. Data obtained after history and examination was analyzed using MS office excel worksheet by Graphpad Instant Software. Chi-square test was used as test of significance.

RESULTS

100 consecutive undernourished children in the age group of 0-6 years, 48 male and 52 females, referred from various anganwadi centers for specialist's opinion were enrolled after applying exclusion criteria. Determinants of undernutrition were categorized as immediate, underlying and basic causes as per UNICEF conceptual framework (Table 1). Analysis of immediate determinants showed Low Birth Weight (LBW) as most common cause seen in 83% children followed by inadequate dietary intake in 65% children. 85% children reported minor illnesses and 14% suffered major illnesses (Table 2). In underlying causes food availability and access was reported to be satisfactory. However quality and quantity of food consumed not satisfactory in 61% children. Availability, access and utilization of health services were not satisfactory in almost 38% families. Similarly 36% families lack safe water supply and environmental sanitation. Care of mother and child appears to be most affected area. Only 20% mothers reporting adequate antenatal care. Recommended breastfeeding practices as per WHO and UNICEF guidelines were found to be adopted in 20% children with satisfactory complementary feeding in 26% children only. Cultural taboos regarding food & health were found in 83% mothers while proper hygiene was practiced in only half. Psychosocial care was found to be adequate in 74% children (Table 3). Amongst basic determinants socioeconomic status was satisfactory in two third families. However other determinants were significantly affected with women empowerment, maternal malnutrition and educational level of the family adversely affecting 23%, 27% and 33% children (Table 4).

Table 1: Categories of causes of undernutrition as per UNICEF conceptual framework.

Immediate determinants (Individual level)	Underlying determinants (Household level)	Basic determinants (Community level) (Lack of capital: Financial, physical, human, social, natural)
Low birth weight	Household food insecurity	Socioeconomic status
Illnesses	Unhealthy household environment & Poor Public Health	Women empowerment
Inadequate dietary intake	Inadequate Care	Educational level of families
	Cultural taboos regarding food	Maternal Health
	Access to water and sanitation	

Table 2: Immediate determinants (Individual determinants).

	Male (48)	Female (52)	Total (n=100)
LBW	41	42	83
Illness (Minor/Major)	41/7	44/7	85/14
Inadequate dietary intake	31	35	65

Table 3: Underlying determinants (Household determinants).

	Male (48)	Female (52)	Total (n=100)
Food			
Availability	48	52	100
Access	48	52	100
Quality/Quantity of food (Satisfactory)	21	18	39
Health			
Access to health services (Availability/Access & utilization)	48/30	52/32	100/62
Sanitary environment & access to water (Satisfactory)	29	35	64
Care			
Care of women (Satisfactory)	11	9	20
Breast feeding (Satisfactory)	19	11	20
Complementary food (Satisfactory)	18	8	26
Hygiene (Satisfactory)	24	30	54
Psychosocial care (Satisfactory)	36	38	74
Cultural taboos regarding food & health	37	46	83

Table 4: Basic determinants.

	Male (48)	Female (52)	Total (n=100)
Socioeconomic status (Satisfactory)	37	30	67
Education level of family (Satisfactory)	17	16	33
Women empowerment (Earning mother)	11	12	23

DISCUSSION

India has made significant progress in last two decades on economic and food availability front. India has been self-sufficient in food production since seventies and low household hunger rates. However these achievements are not keeping pace with child nutrition indicator like undernutrition.[3,17] Studies have failed to find consistent evidence that economic growth leads to reduction in childhood undernutrition in India. Direct investments in appropriate health interventions may be necessary to reduce childhood undernutrition in India.[13] It highlights the need to understand multifactorial nature of determinants of undernutrition. It also underlines necessity of practicing multipronged efforts to fight against important issue of undernutrition.

In our study most determinants of undernutrition as per UNICEF conceptual framework are affected to a lesser or greater extent. Analysis of immediate determinants showed low birth weight as most common cause seen in 83% children followed by inadequate dietary intake in 65% children. 85% children reported minor illnesses and 14% suffered major illnesses. Low birth weight was significant determinant (P=0.0001) of undernutrition. In India, as high as 25-30% of babies are LBW. Amongst these babies, hypoplastic type small for gestational age, SGA-LBW babies results in permanent retardation in physical and mental growth.[11] India's National plan of action aims reduction in incidence of low birth weight infants to less than 10%. However current incidence of LBW babies appears to be alarmingly high.[12] Low birth weight predisposes to undernutrition.[2,22] Though there are multiple causes of LBW, adequate antenatal care is the key factor for prevention of LBW babies. Unfortunately only 30% mothers of under six years children in anganwadi centre receive any service during pregnancy.[8] Hence there is need to strengthen antenatal care. Studies have shown that maternal nutrition and antenatal care as most important determinants and contributors to LBW.[14]

This study showed 65% and 85% children had deficient nutritional intake and illness respectively. Similar findings were reported from other studies.[15,16] Over decades, there has been increasing recognition that though there has been reduction in severe acute food insecurity, dietary intake in large segments of population does not meet energy and micronutrient requirements and consequently under-nutrition and micronutrient deficiencies are widespread.[17]

The most important causes of undernutrition are often inadequate knowledge about the benefits of exclusive breastfeeding and complementary feeding practices, the role of micronutrients and lack of time women have available for appropriate infant care practices and their own care during pregnancy.[6]Analysis of underlying causes in this study showed similar findings. Food availability and access was satisfactory. However quality and quantity of food consumed was not satisfactory in 61% children. Availability, access and utilization of health services were not satisfactory in almost 38% families. Similarly 36% families lack safe water supply and environmental sanitation. Care of mother and child appears to be most affected area. Only 20% mothers reporting adequate antenatal care. Recommended breastfeeding practices as per WHO and UNICEF guidelines were found to be adopted in 20% children with satisfactory complementary feeding in 26% children only. Cultural taboos regarding food and health were found in 83% mothers while proper hygiene was practiced in only half. Psychosocial care was found to be adequate in 74% children. Maximum growth of child takes place in first 1000 days after conception. The greatest risk of undernutrition occurs during pregnancy and in the first two years of life. Hence the 'window of opportunity' for improving nutrition is very small, pre-

pregnancy until 18-24 months of age.[5,6] Hence the service component should be strengthened, especially for under-two children with respect to exclusive breast feeding, supplementary feeding practices, regular growth monitoring, prevention of infections, immunization, health and nutrition education of mothers with necessary follow-up, and corrective actions.[16]

Amongst basic determinants, women empowerment, maternal malnutrition and educational level of the family adversely affecting 23%, 27% and 33% children in spite socioeconomic status being satisfactory in two third families. Correlation between maternal education, maternal nutrition and undernutrition in children has been shown in many other studies. Association of maternal education with child survival and growth and development is consistent and strong.[12,18] A mother with few economic resources who knows how to care for her children and is enabled to do so can often use available food and health services to produce well-nourished children.[6] Similarly health education of mother on various maternal and child health issues will certainly have positive impact on nutrition of children.[19-21]

Planning and integration of health services along with effective implementation requires adequate manpower and their periodic capacity building, infrastructure development, regular supply of quality food items, and logistic support. Distribution of risk factors is going to be different state wise hence its influence on malnutrition status of children in a given set up should be analyzed for planning diverse control measures in different states.[16] Fine tuning of strategies needed as per health needs of community.

Limitation of the study was small sample size. Further multicentric studies done regionally are required to substantiate results of this study.

In conclusion, for prevention of undernutrition all three groups of determinants; namely immediate, underlying and basic determinants need to be addressed. Basic determinants are mostly to be dealt with by policymaker. For medical practitioner level there is strong need to address immediate and underlying determinants. Strengthening service component and health education on various maternal and child health issues will make a good impact on undernutrition. The window of opportunity for improving nutrition is small, from before pregnancy through the first two years of life. Search for locally relevant determinants of undernutrition will be helpful to target intervention measures.

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