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MALNUTRITION AMONG CHILDREN IN INDIA

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Abstract:-In education, children's poor nutrition and health status is rarely recognised as a significant factor for school enrolment, participation and achievement. However, there has been ever growing empirical evidence from global research pointing out that malnourishment among young children influences schooling in several direct and indirect ways. Malnutrition is a wide-spread problem that results from a complex interaction between environmental deprivation and under nutrition. Malnourished children typically experience a range of other environmental difficulties associated with poverty, such as poor housing, poor health-care, weak family and community support systems. There is a need to understand the way child malnutrition and poor health influence access and school participation of children.

In this paper, an attempt is made to draw broad contours for developing such an understanding of the issue rooted in the Indian context. A general overview of the research evidence on the linkage between malnutrition and cognitive development has been presented. The scale and nature of malnourishment among young children in India has been detailed, highlighting the distribution across population groups and states in the country. The paper also presents a discussion of the research evidence in India that correlates malnutrition and other factors related to school participation. Further, two major national intervention programmes aimed at early stimulation and improvement of nutritional status of children have been discussed. Based on the analysis presented in the paper, the last section of the paper identifies areas that need further exploration.

Keywords: Education, Children's, Poor Nutrition, Health Status and Malnourishment

INTRODUCTION

The World Health Organization defines malnutrition as "the cellular imbalance between supply of nutrients and energy and the body's demand for them to ensure growth, maintenance, and specific functions". Women and young children are the most adversely affected groups; one quarter to one half of women of child-bearing age in Africa and South Asia are underweight, which contributes to the number of low birth weight infants born annually. Malnutrition is globally the most important risk factor for illness and death, contributing to more than half of deaths in children worldwide; The World Health Organization estimates that by the year 2015, the prevalence of malnutrition will have decreased to 17.6% globally from 1990 levels, with 113.4 million children younger than 5 years affected as measured by low weight for age. The overwhelming majority of these children, 112.8 million, will live in developing countries with 70% of these children in Asia.¹

The adverse effects of malnutrition include physical and developmental manifestation like poor weight gain and slowing of linear growth. Impairment of immunologic functions in these children mimics those observed in children with AIDS, predisposing them to opportunistic and other typical childhood infections. Apart from making them vulnerable to infections, children who are chronically malnourished exhibit behavioral changes, including irritability, apathy and decreased social responsiveness, anxiety, and attention deficits. In addition, infants and young children who have malnutrition frequently demonstrate developmental delay in delayed achievement of motor skills, delayed mental development, and may have permanent cognitive deficits. The degree of delay and deficit depends on the severity and duration of nutritional compromise and the age at which malnutrition occurs. In general, nutritional insults at younger ages have worse outcomes. Dose-dependent relationships between impaired growth and poor school performance and decreased intellectual achievement have been shown.²

DEFINITION

Malnutrition is the condition that develops when the body does not get the right amount of the vitamins, minerals, and other nutrients it needs to maintain healthy tissues and organ function.

REVIEW OF LITERATURE

India has made a significant progress in economic growth in recent years, but the country's performance in terms of human development indicators remains unsatisfactory. Rates of poverty reduced to 21.8 percent in 2004-05, from 26.1 percent, 1999-2000 (GoI, 2007a). In 2001 census data revealed that absolute numbers of illiterate people had declined in India for the first time (Kapur and Murthi, 2009:2). Health, however, remains an area of concern. Though infant mortality rates have fallen and life expectancy has been rising, health indicators still point to high rates of malnutrition and mortality especially among women and children and a widespread lack of access to health-care.

An assessment of the progress made in Asian countries towards the Millennium Development Goals (MDGs) in 2007 conveys a similar picture of mixed progress (ADB, 2007). The MDGs were adopted in 1990 and designed to achieve prescribed quantitative targets by 2015. While India is rated as an early achiever on primary school enrolment, the progress relating to income, poverty and malnutrition presents a dismal picture. India with 48.5 percent and Bangladesh with 47.5 percent have the highest proportion of under-five children who are underweight in the country. Excluding India, the average underweight prevalence rate in South Asia is 37 percent, indicating a reverse scenario to what was seen in primary education. While in primary education, India with 95 percent enrolment actually increased the regional progress towards the MDG target, for malnutrition, India's high rate of underweight and malnourished children slowed progress. Although Bangladesh has made significant recent progress, India and Bangladesh along with four other countries: Lao PDR, Myanmar, Pakistan and the Philippines are unlikely to achieve the nutrition MDG (ADB, 2007:8).

In another estimate, Gragnolati et al (2005) conclude that taking into account all likely economic growth scenarios; India will not reach the nutrition MDG without direct nutrition interventions. Their analysis is based on data from NFHS-2 (National Family Health Survey) and indicates that in 1998-99 even the wealthiest quintile had a prevalence of malnutrition (33 percent) that far exceeded the MDG goal. Projections indicate that economic growth alone is unlikely to be a sufficient factor to lower the prevalence of malnutrition (see also Bhalotra, 2006). Therefore, a rapid scaling up of health, nutrition, education and infrastructure is needed if the MDG is to be met.

DISTRIBUTION OF CHILD MALNUTRITION IN INDIA

Although malnutrition among children is clearly a significant issue in India, national data on levels and determinants of malnutrition only became available from 1992 when the first National Family Health Survey (NFHS) began collecting anthropometric data on height and weight of children from a representative sample of households in the country. NFHS provides estimates for the country as a whole and for all states; it also gives information on social groups namely scheduled castes, scheduled tribes and other 'backward' classes¹. Disaggregating data from NFHS-3 on stunting, wasting and underweight children under-three indicate that six states in India account for a majority of the underweight children in the country. These include Bihar, Chhattisgarh, Gujarat, Jharkhand, Meghalaya, and Uttar Pradesh. The percentage of underweight children in these states is more than the national average. Children under three who are stunted are also concentrated mainly in these states

(Table 1). Around forty percent of children in Bihar, Chhattisgarh, Gujarat, Jharkhand, Madhya Pradesh, Meghalaya and Orissa are stunted. More than twenty percent of children in Bihar, Jharkhand, Meghalaya and Tamil Nadu are in the category of 'wasted'. Most of the states have more than sixty percent anemic children.

Table 1: Nutritional status of children in India by state (%)

State	Stunted	Wasted	Underweight	Anaemia
Andhra Pradesh	33.9	12.7	36.5	79
Arunachal Pradesh	34.2	16.5	36.9	66.3
Assam	34.8	13.1	40.4	76.7
Bihar	42.3	27.7	58.4	87.6
Chhattisgarh	45.4	17.9	52.1	81
Delhi	35.4	15.5	33.1	63.2
Goa	21.3	12.1	29.3	49.3
Gujarat	42.4	17	47.4	80.1
Haryana	35.9	16.7	41.9	82.5
Himachal Pradesh	26.6	18.8	36.2	58.8
J& K	27.6	15.4	29.4	68.1
Jharkhand	41	31.1	59.2	77.7
Karnataka	38	17.9	41.1	82.7
Kerala	21.1	16.1	28.8	55.7
Madhya Pradesh	39.9	33.3	60.3	82.6
Meghalaya	41.7	28.2	46.3	68.7
Maharashtra	37.9	14.6	39.7	71.9
Manipur	24.7	8.3	23.8	52.8
Mizoram	30.1	9.2	21.6	51.7
Nagaland	30.3	14.6	29.7	NA
Orissa	38.3	18.5	44	74.2
Punjab	27.9	9	27	80.2
Rajasthan	33.7	19.7	44	79.6
Sikkim	28.9	13.1	22.6	56.9
Tamil Nadu	25.1	21.5	33.2	72.5
Tripura	30	19.9	39	67.9
Uttaranchal	31.9	16.2	38	61.5
Uttar Pradesh	46	13.5	47.3	85.1
West Bengal	33	19	43.5	69.4
India	38.4	19.1	45.9	79.2

Source: IIPS, 2007.

Another source of information on nutritional status of populations is the National Nutrition Monitoring Bureau (NNMB). Reviewing the trends of the nutritional status of children in rural areas using the NNMB data and analyzing the determinants of malnutrition using NFHS-2 data showed that eight states combined accounted for 77 percent of the severely malnourished children of India in 1998-99 and 75 percent of the undernourished children (moderate and severe). These states included Andhra Pradesh, Bihar, Madhya Pradesh, Maharashtra, Rajasthan, Uttar Pradesh and West Bengal. Uttar Pradesh alone accounted for 24 percent and Bihar for 11 percent of undernourished children (Radhakrishna and Ravi, 2004a). This analysis also showed that malnourished children were concentrated in these seven states and Orissa. These trends indicate that the main problems are concentrated in some states, and some of these states are not making much improvement.

Table 2: Malnutrition children according to social group in six major states in India(%)

States	Under weight	Severely Malnutrition				Total
		Schedule d Castes	Schedule d Tribes	Other Backwar d Castes	Others	
Bihar	54.1	28.3	36.1	25.5	18.5	25.5
Madhya Pradesh	55.1	30.0	31.4	22.4	14.5	24.3
Uttar Pradesh	51.7	24.1	33.5	25.6	17.6	21.9
Orissa	54.4	24.2	26.5	20.7	12.2	20.7
Rajasthan	50.6	26.1	27.6	19.2	17.0	20.8
Chhattisgarh	60.8	36.5	32.4	21.0	NA	25.90

Source: IIPS, 2000.

Data presented in Table 2 shows that children belonging to specific social groups such as scheduled tribes and scheduled castes have a very high proportion of severely malnourished children in six major states.

DETERMINANTS OF MALNUTRITION

While a child's nutritional status is the immediate outcome of child's dietary intake and child's health status, the underlying and basic determinants of malnutrition are far more complex (for a theoretical framework, see Mosley and Chen, 1984). Three types of resources: household food security; resources for care of mothers and children and; resources for healthrelated issues make up the underlying determinants of malnutrition in children. A number of investigators have analyzed the NFHS data on child malnutrition to understand the determinants of malnutrition (Radhakrishan & Ravi, 2004a; Ramakrishnan et al, 1999; Mishra & Retherford, 2000; Nair, 2007). Using NFHS-2 data, a multivariate analysis of the effects of selected demographic and socio-economic factors on child malnutrition by Mishra et al (1999) indicates that the strongest predictors of child malnutrition are a child's age, the child's birth order, the mother's education and the household's standard of living.

EDUCATION OF MOTHER

Lack of education of mothers is a significant underlying cause of malnutrition in children (UNICEF, 2006). Data from NFHS-3 were analysed to see whether there was an association between the level of maternal schooling and prevalence of malnutrition in children. A clearcut negative relationship between underweight and stunting in children with the level of education of mother is discernible as depicted in Figure 6. Incidence of malnutrition is seen to be much higher among children of illiterate mothers. Completed education of more than 8-9 years is positively associated with malnutrition. Other than wasting, all forms of malnutrition including anaemia seem to reduce with increase in education of mother.

ILLITERACY

Lack of education is a serious predicament resulting in malnourishment because many are illiterate and unknowledgeable about nutrition, family planning, breast-feeding and parenting. Gender inequality places women, the primary care givers of their children, at a lower social status than men and causes them to suffer more because they are last to eat and considered less important continuing the cycle of poverty and malnourishment. Availability of medical care and immunizations are limited to children diminishing their health. All these factors contribute to the devastating amount of malnourished children in India and assistance from the government and international organizations is crucial if this dilemma is to be improved. This paper will focus on the extent of childhood malnourishment in India and what can be done to create sustainable solutions.

POVERTY

The malnourished of India are located in urban, but more so in rural, areas where income and food variety is lower. According to the National Family Health Survey of India, 55% of children living in rural areas suffer from malnutrition compared to 45% of children in urban areas. The situation is particularly grave in states like Bihar, Uttar Pradesh, Madhya

Pradesh and Rajasthan. 29% of the Indian population is below the poverty line, 70% of which live in rural areas. Nearly 30% of newborns have low birth weights and it is proven that females with little to no education more commonly raise malnourished children. Large families with more than three children have greater malnourishment than smaller families due to competition for food and medical care. Those who have childcare practices, such as delayed complementary feeding, are also at risk of malnutrition. Obesity is not very common but does exist in India. It is said the 2% of the population is overweight, which is low compared to staggering numbers of more than 50% in North America. Obesity is less common due to the fact that the population is generally too poor to afford enough food to over indulge and that a majority of the nation is vegetarian and does not eat a lot of meat and fast food which contains high amounts of fat, sugar, and salt. Children are active walking everywhere and completing chores by hand due to lack of vehicles and technology and work at young ages to bring in an income to help support the family. In other nations such as America, children have easy access to transportation, computers and televisions and therefore exercise less.

CURRENT EFFORTS TO ADDRESS MALNUTRITION IN INDIA

Malnutrition strikes children as early as the prenatal period. Therefore, nutrition interventions targeted at expectant women are the best way to prevent malnutrition in children. From the prenatal stage through the early childhood period and right up to late childhood, children must receive comprehensive care that brings about the synergistic effects of health, nutrition and education inputs. As seen in sections 2 and 4, malnutrition affects cognitive development of children as well as school participation in direct and indirect ways. Efforts to combat malnutrition in India have addressed both these aspects. The Government of India proclaimed a National Policy for Children (GoI, 1974) declaring children as a "supremely important asset". The policy provided the required framework for assigning priority to different needs of children. While there are separate schemes targeted at young girls and mothers, namely Nutritional Programme for Adolescent Girls, National Maternity Benefit Scheme etc., two major child development and nutrition programmes that are in operation include the Integrated Child Development Services (ICDS), and the National Programme of Nutritional Support to Primary Education, 2004, commonly known as Mid-Day Meal Programme (MDM).

NATIONAL PROGRAMME OF NUTRITIONAL SUPPORT TO PRIMARY EDUCATION

To boost enrolment in schools, and simultaneously address the problem of malnourishment among school children, the Government of India launched the National Programme of Nutritional Support to Primary Education, popularly known as Mid-Day Meal Programme (MDM) in August 1995. It was thought that supplementary nutrition offered to primary stage school children, apart from improving the nutritional status of children would increase enrolment, attendance and retention, thus bringing all children into primary education. Initially, the scheme distributed 'dry rations' with the expectation that states would move to serve a cooked meal within a period of two years. However, most states continued the same way and the implementation of the scheme largely remained a low-key concern until 2001, when the Supreme Court directed all states to provide a cooked meal for children. This led to major changes on the ground and generated a lot of action among all concerned and resulted in the widening of implementation. With the present reach of 120 million primary school children, MDM is one of the largest school feeding programmes in the world (Afridi, 2005).

The programme provides for a cooked meal with a minimum of 300 kcalories and 8-12 grams of protein content, to be given to all primary stage children in government, local body and government-aided schools, and alternative education centres (GoI, 2004a). In other words, all primary stage children in the public system are expected to receive the meal. In 2006, norms were revised to provide food with nutritive value of 450 kcalories. Another welcome addition has been to incorporate adequate quantities of micronutrients, like iron, folic acid and vitamin A in some states on an experimental basis.

The programme stipulates shared responsibility between the central and state governments. Central assistance is given to the states in terms of supply of free food grains (100 grams of wheat or rice per child per school day) from the nearest grain store; reimbursement of the costs incurred on transportation from the store to the school; cooking costs (1 Rupee per child per school day) and some assistance for the management, monitoring and evaluation of the programme. Thus, the average monetary value of central assistance works out to be 2.21 Rupees per child per school day. While the central government arranges the supply of food grains via the Food Corporation of India up to the school, states are expected to meet the additional cost of cooking the meal, which pre-supposes some physical infrastructure needed for cooking. States are also expected to hire cooks for this purpose and thus, the states' share includes the salaries to be paid to the cooks. The cost of creating the infrastructure for cooking however can be managed from other centrally-sponsored schemes (GoI, 2004a).

ENROLMENT OF CHILDREN:

A survey conducted by the Centre of Equity Studies (CES) in three states- Chhattisgarh, Rajasthan and North Karnataka compared school enrolment in July 2002 with the corresponding figures of the previous year before midday meals were introduced. Class I enrolment in a sample of 81 schools was found to be higher by 14.5 percent between 2001 and 2002. This clear diversion from the trend increase in school enrolment of about 2 percent in the nineties, for India as a whole, the authors believed, was likely to be a reflection of the impact of MDM (Dreze & Goyal, 2003).

An increase in enrolment as a result of the MDM has also been reported in many small-scale studies. A study in Barmer (Rajasthan) on 63 schools indicated an increase in enrolment by 23 percent (Khera, 2002). Another survey showed a rise of 36 percent in class I in Madhya Pradesh (Jain & Shah, 2005). An evaluation of the MDM scheme conducted by the National Institute of Nutrition (NIN) in Andhra Pradesh, Karnataka, Orissa, Tamil Nadu, Kerala and Gujarat, also reported a small increase in enrolment. Orissa registered a higher increase in enrolment as compared to Andhra Pradesh and Karnataka (Brahmam, 2003; cited in NIEPA,2006).

COGNITIVE ABILITIES, SCHOOL PERFORMANCE AND RETENTION:

As noted earlier, the two most common deficiencies that have been shown to have a direct effect on cognitive abilities of children are iron and iodine. Iron deficiency renders children listless, inattentive and uninterested in learning. Poor performance on a wide range of achievement tests among iron deficient children in school has been noted. Remediation of iron deficiency through supplementation can eliminate the differences in school performance and IQ scores between school children previously deficient in iron and those without iron deficiencies (Seshadri & Gopaldas, 1989).

An increase in academic performance and a reduction in the dropout rate were observed in a study carried out in rural schools in Uttar Pradesh (Agarwal et al, 1987). Although the school meal was found to be inadequate to overcome malnutrition and ill health, the study concluded that the meal's nutritional status appeared to be the most important determinant of scholastic performance.

Fortification of school meals is the most efficient and effective route to alleviating micronutrient deficiencies in school children. MDM's potential in this regard remains largely untapped. Fortified beverages or baked grain products fortified with iron are used in several countries as mid-morning snacks or supplementary drinks.

HEALTH AND NUTRITIONAL NEEDS:

The school meal is meant to supplement children's diet and make up the deficiency in calories and proteins. Therefore children must receive an adequate quantity of food. A study by NIN showed that the MDM could bridge only 50 percent of the energy gap. This finding has also been corroborated by other studies (Jain & Shah, 2005; De et al, 2005 2006; Afridi,2005).

The meals provided to children have been found to be deficient in terms of nutritive content. Afridi (2005) calculated the caloric and protein content of the school meal in samples collected from 63 schools in Madhya Pradesh. He found that variety in meals served the purpose of meeting the requirement of recommended allowance rather than serving the same menu on all days. A programme which serves a varied menu was found to meet 22 percent of the daily recommended allowance for children, whereas wheat porridge (the same menu every day) met only 11 percent of the daily recommended allowance of energy intake. One common problem with meeting the nutritional requirements of children was found to be substitute nature of the meal. Most studies reported that the MDM actually serves as a substitute for home food rather than a supplement (Blue, 2005).

Only a few states in the country cater to the need for micronutrients and address health needs by providing de-worming tablets. With the renewed emphasis on the provision of micronutrients, this aspect is likely to receive a boost and will go a long way in addressing the health and nutritional needs of children.

While these interventions have merit, greater attention could be paid to the following concerns. Firstly, since most of the growth disturbances occur in the first two years of life, nutrition interventions to be effective should be targeted early in life. For those children who are not covered in ICDS, primary school is generally the first stage for accessing nutritional interventions. Yet, the school entry age of 6 years is often too late to attempt modifications / reversals of malnutrition (Sood, 2006). Secondly, as MDM covers primary school children who attend school, many children who drop out or who have never enrolled (often girls) do not receive the benefits. Interventions are not reaching these children.

CONCLUSIONS

Empirical evidence shows that malnutrition in early childhood is linked to deficits in the cognitive development of children. These effects have been found to persist through school and result in impaired learning capacities. Stunting in children delays school enrolment and is found to be associated with grade repetition and a higher dropout in primary school children. Children who suffered from early malnutrition were also found to have greater behavioural problems. Deficiency of micronutrients such as iron, iodine and zinc is associated with a lower attention span, poor memory, mental retardation and poor school achievement.

Continuous low nutritional intake combined with poor access to healthcare is likely to impact on children's psychological development in terms of attentiveness, emotional expression, motivation, learning ability and school performance. Nutrition is interconnected with the environment, psychological health, health and education. Considering these issues separately results in an incomplete understanding of poverty and a reduced ability to ameliorate problems.

Another issue that remains inconclusive from the literature review is the degree of reversibility of malnutrition. In other words, are the effects of malnutrition on learning abilities of children permanent or can they be mitigated with adequate

supplementation? Nutritional interventions as reported in some of these studies have in many cases been found to bring about significant improvements. For example, high-quality protein diet led to improved knowledge, numeracy, reading and vocabulary. Arithmetic skills and IQ were also seen to improve as a result of supplementation with high-protein dietary intake. Yet the evidence does not unequivocally support the idea of malnutrition being fully reversible.

It would be worthwhile to explore some research questions to understand malnutrition and its effect on the educational access and participation of children. These can be looked at two levels - the house-hold and the school level.

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