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Background Paper II

XIV ANNUAL MEET OF MFC

MALNUTRITION & CHILD SURVIVAL

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P A R T -I

Kamala Jay Rao.

While we know much about the immediate effects of malnutrition on the growth of a child and its physiological functions, it is equally essential to know the long-term sequelae. Only 2 -4% of the under-five children suffer from severe grades of malnutrition, and some of them survive the ravages. A large majority (nearly 80%) suffer from mild to moderate degrees of malnutrition, and many of them survive and reach adulthood. What is the 'quality of life' of these survivors? The under-five mortality rate is around 20 percent. Of the 80% survivors, one may expect atleast three-fourths or more, to be children suffering from various grades of malnutrition. In absolute numbers it would mean that more than 300 million Indians may be survivors of child hood maluntrition. Hence the question of the 'quality of life', of these is of crucial importance. Are these normal or near-normal adults, or do they suffer any handicap?

Answers to the above question are not easilty available. Socio economic conditions have not improved much for a majority of this population, so that the economic and nutritional constraints that operated during childhood continue through adolescence and adulthood also. So, it becomes difficult to distinguish between the effects of current undernutrition and the long-term consequences of a past episode of malnutrition. Nevertheless there are some studies which indicate some significant points.

In a study conducted by the National Institute of Nutrition (NIN), a large number of children, whose weights and heights were recorded when they were 1-5 years old, were followed-up ten years later (1). The study revealed the following:

1. The actual increase in height, during the ten year period, was 60-62 cm and was similar to that seen in well-to-do Indian children and in Western Children. However, the peak appeared about two years later. In other words, these children took a longer period to reach their maximum height.

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2. It must however be remembered that during the underfive age period, these children were shorter than the well-to-do groups. Therefore, the actual height attained at adoescence was much less. Boys with severe malnutrition were about 14 cm shorter and those with mild and moderate undernutrition were 8 cm shorter. Even the so-called normal children were about 4 cm shorter than well-to-do Indian children of similar age.

3. The increases in body weight, on the other hand, were much less. While well-to-do Indian and western children gained 40-45 kg between 5 - 18 years of age, the mild and moderately undernourished gained only around 30 kg and the severely malnourished, 25 kg.

The above observations show that the physiological mechanisms are geared in such a manner as to allow a normal increase in height. However, the handicap which the child had is not overcome, that is, there is no 'catch-up growth'. Weight increment is equally dependent on current mutrition. Therefore at is difficult to say whether the weight deficit is entirely a relflection of current status or whether it is partly the consequence of childhood undernutrition.

Anyway, the result is, we are left with a population of short, under-weight individuals

The question that may arise is, do short and lean adults suffer any handicap. Does this perse have any adverse effect? (Remember, we are discussing populations who are short and lean, and are not concerned with a single individual who is short and lean.) There have been theories, put forward by western Scientists, that small size per se is not disadvantageous and in fact 'small is healthy'. The small size we are discussing here is a consequence of undernutrition, caused by the lack of opportunity for the physiological growth process to proceed on a natural path. This itself is therefore a pathology and cannot be considered 'healthy'. The 'small is alright' theory implies - and has alsobeen explicity stated at times - that Indians and other Third-world population need not grow to the same extent as the population of the rich nations and therefore they do not

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need as much food (and as a corollary the poor need not be provided the ways and means to buy that much food!).

Apart from the above policy implication, there is an equally serious fall-out. Studies by NIN and also in other parts of the developing world have shown that people with a small size do not possess the same capacity to work as those with better body size (2). Some of these aspects have been recently discussed by C.Gopalan (3).

In the study conducted by NIN (4), adolescent boys employed as farm labour were studied and it was found that:

1. Among boys of the same age, those who were better built were employed for such farm work for which higher wages were paid.

2. Most of the boys who had better body size, had better weights and heights even during the under-five period.

The interpretation would therefore be that most of the children who were malnourished during early childhood, continued to be short and lean in adolescence and the smaller the body size, the less were the wages paid (by experience, the landlords could make out who had better body-build). Studies in an industry, where wages were paid piece-rate (a certain amount of money for a certain amount of work turned out) revealed similar findings (5). This is not only important for individual economy but also for national economy, because workers with small body size do not have enough physical capacity to work and hence efficiency per worker, suffers.

Generally, and for obvious reasons, the well-fed (and therefore the rich) perform light tasks whereas the malnourished and poor have to undertake heavy chores. It is also true that the rich cannot carry a heavy burden or perform a heavy chore with the same felicity as the poor, undernourished man (for eg. pulling a rickshaw). The argument therefore goes that work capacity is more a matter of habit than of muscle strength. It is no doubt true that habit plays an important part, but it is equally important to know, at what expense the heavy chore is being done. The

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study by NIN showed that for the same work load, small-sized boys had higher heart rares - that is, their hearts had to function harder (2). I do not know whether there are any in-depth studis on the incidence and nature of heart diseases among the poor. This would definitely be an extremely worth while study.

The NIN study also revealed another significant, but disturbing, observation. Among those who had similar weights and heights as children, those who later worked as child labour attained less adult heights and weights, than those who went to school. Of course, those who could go to school might have been placed in a better socio-economic status. Never theless, if one assumes that socio-economic differences may not be that different, because growth status at 5 years was similar, one may not be too far off in suggesting that physical labour (out of propertion to the child's age and food intake) had an adverse effect on growth.

This study shows that even severe undernutrition does not damage the capacity of the body to grow during adolescence, particularly the linear growth, but the children cannot make-up the handicap suffered during early childhood. Whether the latter is a permanent effect of childhood under-nutrition cr whether it is a consequence of current undernutrition cannot be differentiated. A small adult body size results in a decreased work capacity, and hence the earning capacity. The study also indicates that physical labour during late childhood in undernourished children, may adversely affect subsequent g growth.

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T A B L E -2

UNDERNUTRITION AND PHYSICAL WORK CAPACITY OF BOYS

Nutrition at 5 yrs.	Body wt. 16 yr.	PWC at 16 yr. Total capacity	PWC at 16 yr. per kg Body weight
Normal	42.4	711	16.6
Mild	36.9	634	17.2
Moderate	36.7	613	16.8
Severe	28.5	431	15.2

T A B L E -1

GROWTH OF RURAL BOYS

	Weight.(kg)			Height (cm.)		
	5 yr.	17 yr.	Increment	5yr.	17 yr,	Increment.
Normal	15.0	46.1	31.6	105.0	164.5	60.5
Mild.	13.8	42.4	29.3	99.8	160.1	61.6
Moderate	12.8	42.0	29.8	95.6	157.0	62.6
Severe	11.1	34.8	24.3	88.5	149.0	62.2
Bostor (USA)			47.5			66.0
Well-to-do India.			40.1			64.0

T A B L E - 3

EARNINGS OF VARIOUS NUTRITIONAL GROUPS

	Less than 1 Re/day		Rs. 1-2/day		RS 2 or more per day	
	15 yr.	15 yr.	15 yr.	15.yr	15 yr.	15 yr.
Mean Body wt. (kg).	24.8	29.2	29.2	34.4	42.5	40.0
Mean Age.	13.6	17.0	13.8	16.4	14.5	16.5

NOTE: This study was done in 1978. Daily wages pertain to that period.

T A B L E - 4

GROWTH AMONG STUDENTS AND CHILD LABOUR

		Wt. Kg. 5 yr.	20 yr.	Inc.	Ht. (cm) 5 yr.	20 yr.	Inc.
Group-I	Students	15.7	54.4	38.8	105.5	170.9	65.4
	C.L.	15.0	49.2	34.2	104.1	163.4	59.3
Group-II	S	13.4	49.9	36.5	97.3	165.3	68.0
	C.L.	13.2	46.5	33.3	97.5	160.7	63.1
Group-III	S	11.6	44.6	32.9	90.0	159.7	69.3
	C.L.	11.5	42.9	31.4	88.5	154.8	66.3

MALNUTRITION AND CHILD SURVIVAL

PART - II

GROWTH OF UNDER NOURISHED GIRLS

Kamala Jay Rao.

The first part of 'Malnutrition and child Survival' dealth a with growth of boys alone. I am dealing with the girls separately due to some unexpected differences been between the sexes.

I had in an earlier paper (1), discussed in detail the sex discrimination in India. Therein I referred to the distorted sex ratio and to the studies which showed that although malnutrition was higher among female children, more malnourished boys boys were brought to the hospitals for treatment. A recent paper by Shanti Ghosh (2) also confirms this. A study from Ludhiana (3) showed that mothers breast fed their male babies for a longer period than the female infants. Shanti Ghosh has also referred to another study, confirming this.

A recent paper by Gopalan wherein he has analysed the data of the National Nutrition Monitoring Bureau (NNMB) (4), shows that in fact the percentage of children with malnutrition is not very different between the sexes and the grades of malnutrition are also not very different. I too had analysed NNMB data (5) which showed that as far as food intake (more conectly, evergy intake) goes, there are not any striking differences between the children. However it appears that medical care may be sought less for girls and boys. The distorted sex ratio at all ages (1,2) indicates that more females die than males, confirming the general neglect of female health and life. It is also well to point out that, whatever be the sociocultural reasons, sex discrisination against girls in whatever sphere - is seen more in the Northern belt of Rajasthan, M.P., U.P. and Bihar. There are more deaths among the females at all ages (1, 2).

With this background, we may now try to see the growth performance of girls during late childhood and adolescence. In the same study which I referred to in part I of the paper, girls were also studied (6).

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1. Surprisingly, the increase in height of girls who suffered from severe grades of malnutrition increase (between 1-5 and 10-15 years of age) was much greater than not only those who were in mild and moderate grades, but even than in American girls. The boys, on the other hand, had similar height increments. Thus in girls with severe malnutrition, we may say, that there was an attempt at 'Catch-up'. However the increments were not sufficient to allow them to attain a normal height. Hence they were still shorter than American and well-to-do Indian girls.

2. Unlike the boys, where body weight increments were less with increasing grades of malnutrition, the girls had similar weight increments irrespective of the degree of malnutrition.

Despite this, however, at adolescence the girls were still shorter and leaner than American girls.

My analysis of the NNMB data (5) showed that adult females have less calorie defict than adult males, or in other words the food intake of women is better than that in men or energy untakes are similar. In the underfive age group there are no sex differences. However the under-five girls had a greater body deficit. This difference was lost when the girls grew up, and body deficit in women is less than in men. That is, women are not as underweight as men.

The reasons for these differences, where girls appear to perform better in late childhood, are not easily forthcoming. We have already seem that the better paid, heavy agricultural tasks were given to better built boys. We have also seen that physical labour during the growth period can have an adverse effect on growth. Perhaps, because of the nature of the task aa well as the higher wages, such chores may not be given to girls. Moreoever, growing girls are generally left at home to do the household chores and to look after the younger siblings. Perhaps this is not as energy consuming and detirmental to health a the heavy agricultural work (Feminists to kindly pardon me). Thirdly, it was observed in this study (7), that girls who were shorter at age 5 (the more undernourished being generally the more short), had menarche at a later age around 15 years, compared to those who had normal height at age 5 (14 years). Irrespective of the age at menarche, the event itself occured when the girls

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had 148-150 cm. height and 36 - 38 kg. body weight. Thus perhaps the girls had a sightly longer period to grow, before epiphysial fusion took place. This however, is and inadequate explanation since we cannot explamn why, if this is true, this mechanism does not operate among boys. Moreover, We also saw that undernourshed boys too, took a longer time to grow.

I may here be permitted to remable a bit on the so-called neglect of the female child and the preference for the male child. At birth, the male child is more vulnerable than the female. There are more still births among male foetuses (2). In healthy affluent populations, more male infants are born ((1040M and 1000 F), but by age 20 or so, females outnumber males (1015F to 1000M). Thus the natural age - specific death rates are always higher in the males. In a community where infant and child mortality is excessively high due to malnutrition, infections and lack of medical care, the community perhaps by experience has realised that the male child needs greater attention. I feel that we do need to look at this in an objective manner and see, whether this may be true. However, as Gopalan (4) had said corectly 'Our Concern is not just to ensure that boys and girls in our poor households suffer equally from ill-health and undernutrition, but that both of them enjoy adequate health care and nutrition, As he says there may not be a deliberate reglect and discrimination against the female child, but the households trapped as they are in poverty and out of reach of good health care, may have to make some painful and difficult chocies. Thus as far as food is concerned there appears to be no discurimination, but perhaps the female child is given second preference as far as seeking medical care and spending money for it, are concerned.

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GROWTH OF RURAL GIRLS

	WEIGHT (kg) 5yr.	18 yr.	INCREMENT	HEIGHT (cm) 5 yr.	18 yr.	INCREMENT
Normal	15.0	44.0	29.1	104.3	155.9	51.8
Mild Mal.	13.9	42.2	29.0	100.0	152.7	54.0
Moderate	12.8	42.0	29.1	95.7	151.1	55.3
Severe	11.6	40.0	28.7	90.1	148.2	58.2
Boston USA	18.6	55.6	37.0	110.2	163.5	53.3

This Table belongs to Part-II Paper.

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