FIGHTING MALNUTRITION AND CHILD DEATH :

EVALUATION OF SPECIAL NUTRITION PROGRAMME (SNP) FOR SCHEDULE CASTE CHILDREN

Report by :
Dr. Bithi Sircar and Sm. Chhanda Debnath (Basu)

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For Schedule Caste Children

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Fighting Malnutrition and Child Death : Evaluation of Special Nutrition Programme (SNP) for Scheduled Castes Children.

Background for Introducing SNP

No one can deny that the children are valuable assets of a nation. If a country is to develop and prosper, the children of today must be alive and healthy (both physically and mentally). However, in most of the developing countries, including India, child mortality and morbidity are still a great problem specially among the poorer section of the population. There were 118 million children living below the officially defined poverty line in India as was reported in 1981. Even though the mortality statistics show that most deaths among children occur due to infective and parasitic diseases, there is no doubt that poverty-linked undernutrition/malnutrition is the underlying or associated cause.

The reason is that the immune defences of the undernourished children are seriously weakened and children become easy victims of various diseases from which deaths may occur relatively easily. Presently in India specific nutritional-deficiency diseases are no longer as frequently encountered as they were before. These conditions have changed into a more moderate and less clearly defined sign of malnutrition. Now the main problem is a certain level of generalized hunger as against starvation; malnutrition here is often a slow and silent killer. Sometimes a child might be classified as apparently healthy because he does not show obvious signs of malnutrition, only when his age is known does one realise that the child is actually a nutritional dwarf, it has a long range effect of retarding growth. Even if the undernourished child does not die, he may grow to adulthood stunted and physically/mentally weak. Often his intellectual development may be adversely affected. This high-lights the human costs of malnutrition, that includes loss in worker efficiency. It is known that control of body size (weight, height, and other anthropometric indices) depends on both

genetic and environmental factors. Now, there is no doubt that the environmental factors are stronger determinants than genetic attribute especially among the poorer section of the population. Among the environmental factors, nutrition is the single most important determinant. Along with this other environmental factors such as unhygienic surroundings, unsatisfactory housing condition, lack of sanitary facilities, poor drinking water supply, lack of medical help etc. also contribute to the problem of malnutrition. In fact, that better environment can bring about better growth has been shown frequently.

The growth status of children is usually accepted as a good index of nutritional status. The average birth weight of infants born to poor mother is definitely less than those born to well-to-do mothers. These babies are handicapped in several ways that frequently results in perinatal and neonatal deaths. Maternal nutrition is believed to be most important cause. The nutritional link between mother and the child continues after birth and upto weaning. During first six months of life when breast milk is the only diet, the growth rate of infants from poor families is not very different from those infants of well-to-do families even though the actual weight may be less. However, after about one year there is considerable slackness in the birth weight. A country wide survey showed that children of 1-5 year old who belong to poor socio-economic group are very much shorter and lighter than other children. This lag in the growth of Indian children is mostly due to insufficiency of calorie resulting from delayed and poor weaning practice. In otherwords, it is now believed that if children get greater quantities of their present home diets (in amount so as to meet their calorie requirements) their protein needs would have been met. In fact, it is frequently shown that the growth of these undernourished children can be strikingly improved by food supplement which provides adequate calories and marginally more protein.

Another important nutritional deficiency disease in India that can be prevented by nutritional supplement is vision impairment due to vitamin A deficiency. About 20% of the blindness in India can be classified as preventable blindness caused by Vitamin A

deficiency. It has been estimated that around 25,000 children become blind every year. Milder cilnical manifestation such as night blindnees, xerosis of the conjunctiva and Bitot's spots are seen 2 to 5 percent of children depending on the region.

Iron deficiency anemia is seen in almost 50 percent of children below the age of 5 years and 30 to 40 percent of women during their reproductive life. Anemia is one of the commonest complications of .pergnancy among the poorer section of the society. Weights of infants born to anemic mothers have been found to be lower than those infants born to non-anemic mothers.

However, the complexity of the health problems of Indian childreen has to be undetstood within the context of several fectors, not the least of which is poverty. Nutrition, though important, is not the only factor that affects growth and its fatal consequences. Nutrition has to be considered within the total framework of the environment. Like nutrition, a clean beautiful and hazard free environment is a greet asset to health. Programmes for the improvenment of the environment should be the second most important factor in support of the health care system. Water-borne and water related diseases like diarrhea, typhoid, dysentry etc. kill as many as 1.5 million Indian children. Another common disease arising from poor sanitation and water contaminated with human excreta is the helminth/disease. Undernutrition, no doubt, aggrevates this situation. On the otherhand these diseases cause malnutrition- thus completing a vicious circle of malnutrition-infection-further malnutrition. To break this vicious circle a large programme of providing safe drinking water, improvement of environmental sanitation, provision of Public Health Care (PHC) Centre should be developed. Besides lack of education, ignorance, superstition, cultural taboos etc. also contribute to the under/mal-nourishment of the children.

THE SPECIAL NUTRITION PROGRAMME (Revised)

Recognising the urgent need for special measures to tackle the problem of malnutrition and undernutrition among children belonging to lower socio-economic group, the special nutritional programme for pre-school children was introduced in 1971. This programme intends to cover children in the age group of 0-6 years in the Tribal Development Blocks and slum areas in the cities. Since the healthy development of the children, particularly infants, is closely related to their mothers' nutritional status during the prenatal and antenatal periods, it has been decided to provide supplementary nutrition to the expected and nursing mothers. In addition, vitamin supplement, weight monitoring of the children and periodic medical check ups are also introduced togetther with the feeding programme. An outline of the programme relevent to the present study is given below.

Nutritional guide

a)   0-1 year......Milk and food of semi-solid consistency given 200 calories and 12 gm of protein is suggested.

b)   1-6 years........ Processed / prepared food giving 300 calories and 12 gm of protein is suggested.

c)   Expectant and nursing mother....... Processed/prepared food giving 500 calories and 20-25 gm of protein is suggested.

In addition, each child may be given vitamin A D capsule daily and multivitamin tablet every alternate day.

Guidelines for administrative overheads

The strength of the feeding centre has been approved to be 100 beneficiaries per centre in the tribal areas and 200 in the urban slum areas.

Number of feeding days is decided to be 300 days in a year. Food should be distributed at a specific place and distribution should start daily at 9 A.M.

For cost of the programme the following ceilings have been fixed : (Revised)

For children :

1) Cost of food (Rice(Atap) - 60 Grams, - Re. 0.45 Paise. Masur dal- 30 Grams and vegetables).

2) Cost of fuel condiments, spices, Vitamin fortification etc. -Re. 0.10 paise.

3) Cost of transportation - Re. 0.10 paise.

4) Cost of administrative overhead -Re. 0.10 paise.

Total - Re. 0.75 Paise

For expectant/nursing mothers:-

1)	Cost of food (Atap rice-90 grams, Masur dal - 45 grams including vegetables)	Re.	0.75	Paise.
2)	Cost of fuel, Condiments, Spices, vitamin fortification etc.	Re.	0.10	,,
3)	Cost of transportation	Re.	0.10	,,
4)	Cost of administrative overhead	Re.	0.10	,,
	Total :	Re.	1.05	Paise.

Honorarium for workers have been arranged to Rs 90/- for helpers and Rs 30/- for organisers.

Overall control and co-ordination

Department of Social Welfare, Govt. of India will be responsible for the effective inplementation of the programme. Whenever necessary assistance from Ministers of Agriculture, Health, Education and Community Development will be sought for.

The programme is implemented by the Central Government through the State Government. It is noteworthy that the creation of an entirely separate administrative set up for this programme is not envisaged in the scheme. The State should evolve a suitable machinary involving various Government Departments and non-government agencies in the State for location of the feeding centre, distribution of food and supervision.

Medical check up

The centre should maintain a register of children attached to it. The Assistant surgeon of the block snould visit the centre at least once in two months to examine the children. The first check up should be held in the firstweek after the commencement of the scheme so that the subsequent check ups reveal the improvement in health, if any. The observations based on the check ups should be recorded in the register.

Evaluation

The scheme provides for periodic evaluation to assess the impact on the beneficiaries. Apart from medical check ups, records of height and weight of the children should be kept at the centre and monitored.

Other competent Institution in the state should be requested to take up special evaluation of the programme and necessary grants for the expenditure could be made available for such studies.

THE PRESENT STUDY

Objective

The objective of the present study is to try to evaluate the special nutrition programmes that have been continued for more than 4 years in two different centres located in the suburbs of Agartala where the majority of the population belongs to sceduled caste community. We hope that this project will not only-shed some lights on the brighter and darker sides of the scheme and be able to make several recommendations on improvement of such programme, but also will focus on various aspects of the nutritional problems among the schedule caste children in Agartala slum areas.

Area selection and particulars of the area

Areas selected are (1) South Ramnagar (Itkhola) and (2) Bhati Abhoynagar (Hrishidas colony). These two areas were chosen after discussion with the special Extension Officer, Directorate of Welfare for Scheduled Tribes, Special Nutrition Programme, Agartala.

Various facilities available in the immediate vicinity of the two areas are given in Table 1. Even though most of the urban facilities are available in both the areas, the overall environmental conditions are found to be extremely unsatisfactory. As for example, in Ramnagar area no sanitary facilities are available. Their sewage system consists of kaccha drain. Houses are very congested etc. The conditions of · Hrisidas colony are even worse. Even though there are sanitary latrine, pucca drain, several tube wells available in this area, the dirty and contaminated ' Kata Khal ' (the man made channel) that surrounds the area pollutes the people excessively. They use this water frequently for their household uses (other than drinking water) without realising the danger involved in this. The prevalent disease among the children and among some adults is scabbies, a skin disease which is extremely contagious and might be caused for this poor environmental condition.

Set of photographs in Plate I depicts this poor environmental condition: the photographs are self explanatory.

Particulars of the feeding centres

Particulars are given in Table 2. Several points can be noted. Even though the enrollment is much less than what is alloted by the scheme (only about 70 as against 200 beneficiaries), the attendance is quite satisfactory in both the centres. Children seem to be eagerly waiting and quickly finishing the food indicating hungry state. The food is served at around 9 or 10 A.M. This is probably their first morning meal and may be the only substantial meal. Food quality seems satisfactory. The relationship between the workers and children seems to be also fairly good.

However, we have noticed several deviations from the original suggestion of the programme organiser. These points are worth discussing from the stand point of proper implementation of the programme. The points are as follows :

1) No milk was given to 0-1 year old children
2) No food supplement was given to the expectant or nursing mothers.
3) Vitamin A supplement was only given once in one area while iron tablets were given in the other area once.
4) No weight monitoring was done in either of the Centre.
5) Medical check ups were not done periodically in any of the centres as suggested. Check up was done once in one area in four years and twice in the other area in four years.
6) The number of feeding days was not 300 days as suggested. This, I understand is due to difficulties like unavailibility of rations, bad weather, too many holidays etc.

These points are to be discussed in proper perspective as regard whether the authority has faced some difficulties in continuing the programme in toto as suggested or whether it felt that these points are not important enough to pursue.

Particulars of the children (the beneficiaries)

The nutritional status of the children are determined by two accepted methods; a) physical anthropometry and b) clinical observation.

Physical Antropometry

Anthropometry is extensively used as a field method for the assessment of nutritional status among children. Body weight has been by far the most frequently used criterion, provided it is related to the correct age of the children. In some communities knowledge of exact age of the child is not easy to find. This limits the use of anthropometric indices based on heights and weights which vary with age. However, some indices are available which are also indicative of nutritional status of children. Quatlet index based on relationship between weight and height is one such measure. Mid-arm circumference is another age-independent measure of malnutrition that is extensively used in case of children. Mid-arm circumference/head circumference ratio is also a useful measure which is age-independent.

In the present study heights, weights, mid-arm circumference and head cicumference are recorded for the children under study using standard procedure. Ages are also recorded from register book. The average heights in cm and weights in kg of the children in two areas (Ramnagar & Rishidas Colony) according to age and sex are given in Table III. The average values for Indian children are also given in the same table for comparison. In both areas for every age group (except for a one year old child in Hrishidas colony) the values for heights and weights in both sexes for the children are found to be lower than the Indian average. When these values are compared with the values that we obtained earlier for the children in Noagaon village in Mohonpur Block the values are surprisingly similar (Table III). It is worth mentioning that the population studied in Noagaon village also belonged to poor socio-economic status.

In Table IV average values for three age-independent anthropometric indices for the children are given according to

their ages as well. Single standard values for each index is used for comparison. Also values from the children of Noagao village are given. It appears that most children from both the areas are borderline cases, that is they are suffering from mild to moderate form of malnutrition according to the standard values given for these indices (given at the bottom of each part of table IV).

Clinical observations

Number of children from both areas showing clinical symptoms related to nutritional deficiency are shown in Table 6. Large number of children are suffering from either Vit A or Vit B deficiency or both. Severe form of malnutrition (Protein Calorie malnutrition, PCM) exists among 16% of the children. This is quite high in comparison to Indian average. Discoloured brown hair is taken to be as initial sign for protein deficiency-related malnutrition. This is quite high among the children. Besides, other diseases (not directly related to malnutrition but are surely aggrevated by it) like diarrhoea, skin disease, dental caries, respiratory disease are also quite prevalent in the areas. It is worth mentioning here once more that a large number of children from Hrishidas Colony suffers from Scabies, a skin disease caused by an insect mite rarely visible with naked eye. Itching is intense specially with warmth.

Another important observation related to immunization is that even though in the Ramnagar area 56% of the children have taken at least Ist dose of DPT immunization, only 8% have taken it in Hrishidas Colony.

Plate II and Plate III show photographs of some of the children of Ramnagar and Hrishidas Colony respectively. The pictures depict the sordid state of child health.

Particulars of the families of the children

Fourteen families to which the children under study belong to are chosen from each area. The age structure, some socio-economic pattern, nutritional pattern etc. of the families are given in Table VI A and B. Almost 30% of the population belongs to 0-5 year age group whereas only about 15% belongs to the age group above 35 years. This is typical of a poor society. In Ramnagar, five out of fourteen families earn their living by rikshaw pulling (36%), another eight families are daily labourer (57%), one is in service. People in Hrisidas colony are predominatly a cobler community. As mentioned earlier they belong to a co-operative which sales shoes and is known as Bhati Abhoy Nagar Hrishidas Palli Samabay Samity. Six families out of fourteen earn their living through shoe-making (43%), four through rikshaw pulling (29%) and four through some kind of service (29%). Surprisingly the literacy rate in both areas are very low (between 20-30%). All 14 families in Ramnagar use tubewell for their drinking water source. In Hrishidas colony 11 families use piped water and the other 3 families use ring well water for dringking purpose. In Ramnagar all 14 families use open pit for disposal of their excreta. In Hrisidas colony 9 families use sanitary latrine while the other 5 use open pit.

Dietary survey done by questionnaire method reveals that daily per capita average calorie uptakes of the 14 families in Ramnagar and Hrisidas colony are 2355 and 2063 calorie respectively. The average protein uptakes in gram (daily per capita) are 52 and 42 gm respectively for Ramnagar and Hrisidas colony. Calorie uptakes are less than the recommended values which is 2400 calories. The protein uptakes seem to be adequate (recommended allowance is 50gm). Families in the Hrisidas colony are relatively in poorer state than the families in Ramnagar regarding calorie and protein uptake. Health status in both areas are equally bad. Ten families have some kind of health problems as shown in Table 7B. Scabies is prevalent among the adult population of Hrisidas colony as well. Other diseases are quite common among the poor population.

All these information about the families are collected by questionnaire method for which a schedule is used (enclosed at the end).

Comments on the present evaluation technique.

Only two urban slum areas were selected in the Agartala Municipal area for the study. Although the sample size is small, it reflects the overall picture of nutritional status of the urban slum areas. Two places were visited frequently to get various informations given in the report. However, not all children registered were present all the time of the visit to the centre. Therefore discrepencies may sometimes be observed regarding the number of children in a particular age group in various tables.

In this study dietary uptake of the family was measured by Questionnaire method. This only gives approximation of nutrition up'ake per family. People tends to inflate the amount of their food intake when questioned. There may be upto 20% error in the estimation. However, one should remember that in a socio-economically poor community people get almost 80-90% of their calorie and protein requirement from rice only. This results in various types of nutritional deficiency.

The immunization status of the children of these two areas were found to be very poor. This is inspite of the fact that they live very near to the Hospital where immunizations are given free. This reflects on the lack of awareness of the community. This means health education is urgently needed in the slum areas.

In this study the overall incidence of protein-calorie-malnutrition (PCM) was found to be only 16% which is much less than the all Tripura average. However, from age-independent anthropometry (Table IV) it is clear that most of the children were between moderately to severely malnourished. For children below five years these age-independent anthropometry are frequently used to evaluate the health and nutritional status. Nutritional deficiency symptoms as given in Table V were re-

corded with the help of an expert. Prevalent diseases existed in the two localities among the children (Table V) were found out through questionnaire method.

In Table VI, 30% of the population were found to be in the age group of 0-5 years which appears to be quite high compared to the average figure of 17%. This may also be due to small number of families included in the study.

GENERAL DISCUSSION AND RECOMMENDATION

It is clear from this study that the nutritional/health status of the children who are under the special nutrition programme (SNP) in both Ramnagar and Hrishidas Colony are far from satisfactory. The reasons are several, interrelated and complex.

First of all, in both the areas under study the programme is not being followed in toto (as mentioned in page 7). Several benefits that were recommended by the organizer are omitted here. Those benefits are essential for health and nutrition of the child in question. For example, the fact that the expectant mother and infants of 0-1 year are not getting fed through the programme would definitely cause dent on the nutrition and health status of 1-5 year old. Omission of Vit A and multivitamin supplementation would be responsible for a large scale vision impairment and other deficiency dieases which could easily be prevented. Weight monitoring, a very simple method to evaluate a child's nutritional/health status, was not done. This could have helped in early detection of malnutrition and can be taken care of. However, the most important omission is the regular medical check ups of the children. As discussed earlier once a child becomes victim of infection whatever the cause may be, until it is cured the child gets into a vicious circle of INFECTION-> MALNUTRITION- > MORE INFECTION-> MORE MALNUTRI-TION ultimately causing death. Regular medical check up would detect and take care of this infection in an early stage.

The implementing authorities of the programme in the two respective areas may have some practical reasons to run the

programme without these benefits mentioned above. However, it is felt that for proper implementation and to get best possible result out of the programme these points should be considered.

Secondly, the Special Nutrition Programme as is outlined by the Central Government has its own limitations. This is essentially a 'crash' programme intends to tackle a enormous problem of undernutrition among the children of poor socio-economic origin. The arguement against this kind of programme is that this becomes virtually a charity programme leaving little lasting residues when the support is withdrawn.

Another criticism is that the food supplement in most cases become either replacement or substitute of their daily diets rather than a real supplement. This is clear from the eagerness of the children to eat in both areas.

Another important point to note is that in outlining the programme no importance was given to the impact of unclean environment on the impoverished children. The contribution of unfavourable environment such as lack of clean drinking water, poor sanitation etc. causing infections and infestations has been considered to be an important factor in development of nutritional disorder. In Hrishidas Colony area the poor environmental condition may contribute a lot to the poor health status of the children.

Health education like nutrition and imporvement in the environment is a supportive and essential service specially in the poorer section of the society. But since the effect of health education is indirect, non-quantifiable and difficult to measule, it often tends to be ignored. It can not be denied that many of the health problems of the poor can be solved to a large extent through health education. For instance, the most frequent meassages they need are related to (1) sanitary disposal of excreta and waste water, (2) control of vectors, (3) use of clean water, (4) maintenance of good personal hygiens, (5) importance of immunization etc. etc.

Nutrition education is another important area to purue. This has

been also a rather neglected area in public health activities. Even though it is a slow process a well designed realistic nutrition education such as (1) knowledge of low-cost nutrient food, their preparation and preservation, (2) production of nutrient food locally, (3) encouragement of breast feeding and good weaning practice, etc. may achieve beneficial results. In this respect the education of mothers on the proper care of children is very important.

Perhaps the most imprtant measure to bring about a definite change in the nutritional status of the poor would be to increase the purchasing power of the poor. It is not possible to imporve the nutritional status of a child without imporving the nutritional status of the family as a whole. This can only be done by increasing the family income through guaranteed employment at reasonable wages. A national nutritional movement would work best when the cost and responsibility of nutrition delivery would rest principally on the household.

CONCLUSION

It is quite clear that an integrated approach which not only provides food supplements but also has provision for health inputs, educational inputs and imporvement of environmental condition as well, would be the best solution of the problem of raising the level of nutrition among the children. There should also be a guaranteed employment to every adult of the family.

This does not mean that there is not place for supplementary feeding. It is needed in calamities like famines and floods. There is also a justification for selected and supplementary feeding directed at carefully identified target groups at risk. But such programmes have to be planned more carefully and built into an integrated programme of community health care. This is the direction in which we should try to move.

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2. The child in India. Editors, K.Srinivasan, P.C. Saxena and Tara Kanitkar. 1979.

3. Studies on pre-school children. ICMR Technical Report Series No. 26.1977.

4. A report to UNICEF; An Evaluation of the Health Status of Children in the 0-6 years age group in Noagao Village, Mohonpur Block, West Tripura District. 1985.

5. Early detection and prevention of PCM by P.M. Shah, 1981.

Table I

Facilities available in the areas under study
(within one km radius)

		Ramnagar	Hrishidas Colony
1.	School		
	Balwadi	Yes	Yes
	Primary	Yes	Yes
	Secondary	Yes	Yes
	Higher Secondary	Yes	Yes
2.	Ration shop	Yes	Yes
3.	Co-Operative	Yes	Yes
4.	Industry	No	Yes
5.	Electric supply	Yes	Yes
6.	Sewage system	Kaccha	Pucca
7.	Sanitary system	No	Yes
8.	Drinking wate	Tube well	Piped water
9.	Health facilities	Yes (Upasasthya kendra)	Yes (Upasasthya kendra)
10.	Treatment used	Allopathy	Allopathy
11.	Personal Hygiene	Fair to bad	Unsatisfactory
12.	Housing	Brick	Bamboo

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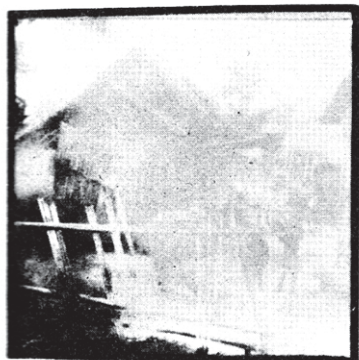
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HRISHIDAS COLONY (1-6)

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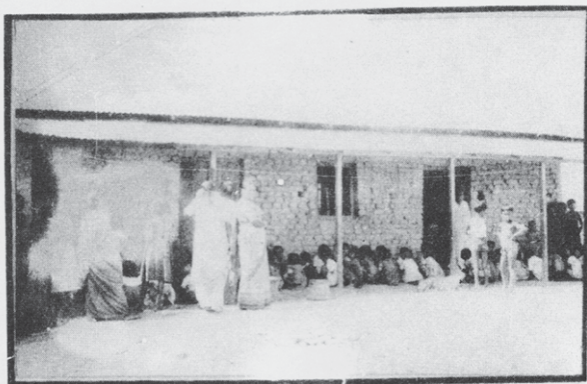
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RAMNAGAR ITKHOLA (7-9)

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Children under SNP Ramnagar

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Children under SNP Ramnagar

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Children under SNP (Hrishidas Colony)

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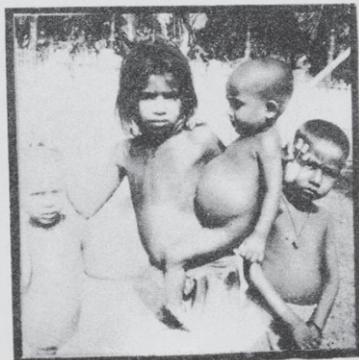
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Children under SNP (Hrishidas Colony)

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Table II
Particulars about the feeding centres

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	Particulars	Ramnagar	Hrishidas Colony
1.	Families included	150	75
2.	Financed by	SNP schme	SNP scheme
3.	Supervised by	Social Education	Harijan Sevak Sanga
4.	Started at	1982	1983
5.	No of children enrolled	1982:80 1983:80 1984:75 1985:70 1986:73	1983:75 1984:79 1985:75 1986:75
6.	Number of helpers	2 SEW, 2 School mother, 1 helper	1 SEW,1 helper
7.	Feeding time	9:30 A.M.	9:30 A.M.
8.	Number of days fed	Except Sundays, holidays and when ration is not available	Some as in the other area.
9.	Average daily attendance	71	70
10.	Vitamin A or other supplement	Vit-A once in 1982	Iron tablet once
11.	Weight monitoring	No	No
12.	Medical check up	Once, 1982	Twice
13.	Type of food	Khicheri with vegetables	Khicheri
14.	Balwadi eduction	Pre-primary 6:30 to 9:30	Pre-primary 6:30 to 9:30
15.	Any other help	No.	No.
16.	Problem faced by the workers	None	None

Table III
Weights and Heights of the children in both areas
[gives number of children]

1] Weights in Kg.

Age (Yr.)	Male				Female			
	Ramnagar	Hrishidas	Ind.	Noagaon	Ramnagar	Hrishidas	Ind.	Noagao
1	-	6.5(2)	9.5	7.5(12)	-	10(1)	8.7	7.2(9)
2	-	9.3(8)	11.3	9.6(13)	-	8.9(7)	10.5	9.0(6)
3	9.5(1)	10.7(6)	13.8	10.1(7)	9.0(1)	10.4(7)	12.3	9.6(11)
4	12.5(7)	11.9(8)	15.8	11.2(9)	10.2(4)	11.2(5)	14.5	10.8(9)
5	15.0(1)	12.8(4)	18.3	13.5(10)	10.3(3)	13.0(7)	16.9	12.9(11)
6	15.0(6)	14.3(4)	20.5	-	14.6(5)	14.9(7)	19.5	-

2] Heights in cm.

Age (Yr.)	Male				Female			
	Ram.	Hrisidas	Ind.	Noagao	Ram.	Hrisidas	Ind.	Noagao
1	-	71	72	66	-	75	73	68
2	-	79	85	77	-	78	84	76
3	92	88	94	85	78	85	93	84
4	94	92	102	88	84	89	100	87
5	103	97	108	98	90	102	108	97
6	107	107	114	-	107	107	114	-

Table IV
Age-independent anthropometric indices of the children

1. Quetlet index = ((Weight in Kg / Height in cm) 2x100)

Age (Yr.)	Male			Female		
	Ramnagar	Hrishidas	Noagao	Ramn.	Hrisi.	Noagao
1.	-	0.133	0.166	-	0.177	0.155
2.	-	0.148	0.161	-	0.147	0.149
3.	0.110	0.138	0.140	0.151	0.141	0.137
4.	0.143	0.140	0.144	0.143	0.140	0.145
5.	0.140	0.140	0.144	0.127	0.130	0.136
6.	0.131	0.130		0.138	0.130	-
Mean	0.131	0.138	0.150	0.140	0.144	0.144

Please Note : Values less than 0.14 is considered to tbe grossly malnourished, 0.14 is border line case.

2. Mid-arm circumference in cm.

Age (Yr.)	Male			Female		
	Ram.	Hrisidas	Noagao	Ram.	Hrisi.	Noagao
1	-	11.5	11.6	-	12.5	11.7
2	-	13.0	12.3	-	12.9	11.7
3	13.0	13.1	12.9	12.0	13.4	12.1
4	14.1	13.4	12.4	13.8	13.6	12.8
5	16.4	13.8	13.1	13.3	13.1	13.0
6	14.5	13.3	-	14.3	14.6	-
Mean	14.5	13.0	12.5	13.4	13.4	12.3

Please Note : Values between 12.5 to 13.5 is considered to be malnourished.

3. Mid-arm circumference in cm/ Head circumference in cm

Age (Yr.)	Male			Female		
	Ramnagar	Hrisidas	Noagao	Ramnagar	Hrisidas	Noagao
1	-	0.260	0.273	-	0.260	0.276
2	-	0.282	0.279	-	0.284	0.275
3	0.280	0.286	0.282	0.270	0.290	0.271
4	0.271	0.290	0.265	0.297	0.306	0.278
5	0.356	0.300	0.275	0.297	0.280	0.288
6	0.298	0.270	-	0.302	0.320	-
Mean	0.300	0.280	0.276	0.290	0.290	0.278

Note : Values betwwen 0.280-0.314 indicate mild malnutrition between 0.250-0.279 indicate moderate malnutrition and less than 0.249 indicate servere malnutrition

Table V

1] Nutritional deficiency symptoms among the children (0-6 years)

Disease ·	Ramnagar (28)	Hrisidas (66)
1. Angular stomatitis (Vit-B defic)	12(43%)	3(6%)4.5%
2. Bitot spot/night blindness (Vit.-A deficien.)	8(29%)	23(43%)
3. Discoloured hair (protein deficiency)	10(36%)	10(19%)
4. Protein-calory malnutrition	3(11%)	12(22%)

2] Immunization status

	Ramnagar	Hrisidas
		Hrisidas
YES	56%	8%
NO	44%	92%

3] Other prevalent diseases.
   Diarrhoea
   Worm infestation
   Dental caries
   Skin disease
   Respiratory problem

Table VI

A. Age structure of the family surveyed

Age class	Ramnagar			Hrisidas		
(year)	(14 families)			(14 families)		
	number	%	cumul.%	number	%	cumul%
0-1	5	7.0	7.0	1	1.4	1.4
1-3	5	7.0	14.0	10	14.2	15.6
4-5	11	15.5	29.6	12	17.1	32.8
6-10	10	14.1	43.7	17	24.3	57.1
11-15	6	8.5	52.1	2	2.9	60.0
16-20	1	1.4	53.5	2	2.9	62.9
21-25	4	5.6	59.2	3	4.3	67.2
26-30	9	12.7	71.8	7	10.0	77.2
31-35	6	8.5	80.3	10	14.2	91.4
36-40	6	8.5	88.8	4	5.7	97.1
41-45	4	5.6	94.4	1	1.4	98.5
>45	4	5.6	100.0	1	1.4	100.0
Total	71			70		

B.   Particulars of the families surveyed

		Ramnagar	Hrisidas
1.	Number surveyed	14	14
2.	Family member	71	70
3.	Family unit	5.1	5.0
4.	Male:Female	0.97	0.84
5.	Occupation:		
	Rikshaw puller	5(36%)	4(29%)
	Day labourer	8(57%)	-
	Cobler	-	6(43%)
	Service	1(7%)	4(29%)
6.	Educational (adult)	30%	20%
7.	Drinking water :		
	Tube well	14(100%)	-
	Pipe	11-(78%)	11(78%)
	Ring well	-	3 (22%)
8.	Defication habit:		
	Sanitary	-	9(64%)
	Open pit	14(100%)	5(36%)
9.	Nutrition :		
	Calorie	2355	2063
	Protein (gm)	52	42
10.	Health :		
	Dysentery/gastric	8(57%)	3(22%)
	Scabies	-	5(36%)
	Asma	1(7%)	1(7%)
	Night blind	1(7%)	1(7%)

HOUSEHOLD SURVEY   HH No_____

1.   Name of the head of HH

2.   Address

3.   SC/ST/Other (specify)

4.   Religion

5.   Family particulars :

Name	Sex	Age	Marital Status	Occupation		Months Employ	Indiv Income
				I	II		

6. Total family income ....

7. Assets of house-hold :

a) Land owned (homestead / Agriculture) ....

b) Home owned (description) ....

c) Birds/animals owned ....

d) Other household goods ....

8. Total outstanding debts :

    Amount .... Purpose ....

9. Govt. assistance : Yes/No

10. No. of deaths (last 5 years)

11. Sources of drinking water :

a) Piped water in home / piped water outside home / tank
    / deep tube well / ring well / others

b) Way of purification :
    Boiled / Filtered / Medicated / None

c) Is sufficient water available throughout the year
    : Yes/No...
    If no, when not
    available..

12. Defecation habit :

    Pit / Open air / Sanitary / other
    How do they wash their hand after defecation
    ....Water / mud / soap

13. Non-food consumption pattern :

Items used	Total amount unit	Price per price	
1	2	3	

Fuel

Firewood

Kerosine

Miscelleneous

Clothing

(yearly)

Houserent

(Monthly)

Medicine

Education

Soap

Hair oil

Others

14. Food consumption pattern :

Types of Food day /week / month 1	Total amount used 2	Price per unit 3	Total price 4
a) Cereal :			
Rice			
Wheat			
Puffed rice			
Rice flakes			
b) Pulses			
Lentil (Musur)			
(Mung)			
(Chola)			
c) Vegetables :			
d) Roots :			
Potato			
Sweet potato			
Onion			
e) Fruits			
f) Fishes			
g) Meat			
h) Egg			
i) Milk			
j) Fats/Oils			
k) Sugar/gur			
l) Spices			
m) Tea			
n) Salt			
o) Others			

15. Personal hygiene :

a) Personal appearance   G/F/B

b) Cleaniness of home   G/F/B

c) Cleaniness of kitchen   G/F/B

d) Is it a habit to wash

before eating   Y/N

16. Medical facilities available :

a) Health Centre/Hospital/

Private doctor/Quack/other

b) Treatment used : Allopathy/Homeopathy

Aurvedic

c) Immunisation for children   Y/N