EFFECTIVE MEANS TO ADDRESS MODERATELY MALNOURISHED CHILDREN WITHIN BINP COMMUNITIES

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Title:

Effective means to address moderately malnourished children within BINP communities.

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Abstract

Bangladesh has one of the highest rates of childhood malnutrition in the world. The Bangladesh Integrated nutrition Project (BINP) is a recent initiative of the Government of Bangladesh to reduce malnutrition of women and children under two years of age. The BINP includes a specific programme to address severely malnourished children at the community level. however there is no such programme directed toward moderately malnourished children. Moderately malnourished children form a large proportion of children in the community. and with success of the BINP, this proportion is growing as severely malnourished children shift to the moderately malnourished category. To address this. operations research will be undertaken in a BINP thana named Shahrasti. in Chandpur District over a 6 month period. A total of 300 children in three groups from community nutrition centres will be studied. A Control group of 100 children will receive the usual programme inputs and their weight gain will be recorded. In addition to usual component of the BINP. mothers of the first group of intervention will receive intensive nutrition education and motivation for child care. complementary food demonstration. and household food mobilization for child feeding weekly for first four weeks then reinforced every two weeks. The second intervention group will receive a packet of the usual BINP food supplement daily for 6 days a week for 3 months and nutrition education at the same intensity. The CNP and women group and village nutrition committee will be involved. Focus group discussion will be held with mothers. Data on morbidity will be collected and necessary medical advise will be given equal to each group. Data collection. counselling on child caring practice. food demonstration and nutrion education using IEC will be organized and supervised by project

staff. It is assumed that if the intervention is successful, and once the nutritional status improves, they are likely to maintain good health. The IEC on dietary practice will be communicated to the village members for preventive measures. Data will be analyzed for change in nutrition groups from moderate to mild malnutrition or normal nutrition and will be compared between the control and two intervention groups. It is expected that the results of the study will help address to reduce moderate malnutrition existing in the large proportion of malnourished children. This will in turn reduce the risk of regressing to severe malnutrition.

Background and statement of the problem:

Bangladesh is one the countries having the highest proportion of malnourished children in the world. The infant and child mortality are also among the highest in south Asia. In Bangladesh, about two thirds of all childhood death are associated with underlying malnutrition. The consequences of childhood malnutrition are many. Frequent episodes and longer duration of infections, inadequate control of diseases, insecurity of food and inadequate caring practices are major causes of malnutrition. The high incidence of low birth weight is also an important risk factor for malnutrition, morbidity and mortality. Childhood malnutrition is associated with reduced cognitive development and learning ability, the government of Bangladesh has been trying different ways of reducing childhood malnutrition. Such programmes include the vulnerable Group Development Project, vitamin A distribution project, iodine deficiency disorder control programme, iron supplementation programme and improving food availability for the underprivileged sections of the society. Despite these, not enough improvement has been observed in the field of nutrition. In review

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of the past fifty years information of dietary intake and growth. it has been observed that food intake has substantially reduced and growth faltering in children has worsened.

Major nutritional problems. Bangladesh suffers from some of the severest malnutrition problems in the world. The primary forms of malnutrition found in Bangladesh are: Childhood undernutrition in the form of protein energy malnutrition (PEM): all- round maternal undernutrition as evidenced by low weight. short stature and anemia in pregnant and lactating women: and disorders of micronutrients deficiencies. particular among all ages of Vitamin A. iron and iodine. The effects of childhood undernutrition. beginning with a low birth weight (estimated to occur among 35-50% of births in Bangladesh) continue into adulthood. particular among whose malnutrition is compounded by the strains of adolescence. maternity. and lactation.

Protein energy malnutrition (PEM) is currently the most widespread and serious health problem of children of developing world. Moderate and severe malnutrition are endemic in much of the developing world and in association with pockets of deprivation in the developing world. Using the WHO global data base on child growth. which covers 87% of the total population of under 5 years old in developing countries. the world wide population of PEM based on nationally representative cross sectional data in 79 developing countries in Asia. Latin America and Oceania confirm that more than a third of world children are affected. For all indicators e.g wasting. stunting and underweight. there is high prevalence in most countries of Asia (De Onis et al. Bull WHO 1993). Of the total children with malnutrition. 80% live in Asia. PEM. iron deficiency anemia. iodine deficiency and vitamin A deficiency are the most common. persistent problems in Asia. The nutritional situation of

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children in Bangladesh is also grim. The children in this country are the worst victims of the poverty, malnutrition and disease. Taking both height for age and weight for height into consideration , 69% of children between 6 and 71 months of age are victims of malnutrition of any kind or other. The prevalence of severe underweight is 24.9% and that of moderate underweight is 43.4%.

The prevalence of PEM among children is very high, and has remained almost the same for the last decade. Thirty of all children under six years of age are severely stunted and another 31.2% moderately stunted. As many as 68.3% of the children are under - weight and 16.7% wasted, the highest rates in Asia. Malnutrition plays a role in about two-thirds of under five deaths: of these , 73% are related to mild and moderate malnutrition. Given the greatly disadvantaged start by way of a low birth - weight followed by inadequate breast - feeding by their undernourished mothers, average Bangladeshi infants are already below the lower end of the range of anthropometric values found among western babies during the first three to six months. The late and insufficient introduction of complementary feeding further retards the infant's growth: usually the child do not pick up its pace of growth before two years of age. By then, it is too late to reverse the early growth lag which persists throughout life and similarly some of the damages done to mental development are irreparable. The weight for age curve of Bangladesh children continues to lie below the third percentile of the Harvard Standard, though it runs roughly parallel to the standard from around the second year of life onward: the older children cope better with the adverse milieu of food- insecure and unhealthy household. while being unable to regain lost ground.

Role of morbidity in causing malnutrition:

UNICEF has popularized the concept that there are three determinants of malnutrition namely a) lack of food security, b) lack of disease control and lack of caring practices. The one important component of morbidity has been shown to be significantly related to genesis of malnutrition. Studies reported from Bangladesh and other countries have shown that frequent diarrhoea causes malnutrition and invasive diarrhoea is responsible for stunting in children. It is known that severely malnourished children have associated infections many of which are sub clinical. It is also possible that moderately malnourished children have reduced immunity compared to well nourished children and this would increase risk of infections. During infection, specially diarrhoea, acute respiratory infection, fever, pneumonia, children are seen to have reduced food intake. This may involve several mechanism, such as anorexia, taboo on feeding during illness, malabsorption, loss of endogenous nutrients from the body, increased energy expenditure due to high temperature, loss of nutrients through urine and catabolism due to interleukin production. To understand the contribution infection in physical growth and effects of dietary interventions, it is necessary to quantity the burden of morbidity.

Definition of moderate malnutrition:

According to the Gomez classification Grade II or moderate malnutrition is defined when the weight for age of a child is 60-75 of the 50th centile for weight of the National Centre for Health Statistics (NCHS) data. The prevalence of moderate malnutrition in Bangladeshi children is 47.2% (Child nutrition survey, BBS 1992). The prevalence of malnutrition is higher in rural than in the urban and higher in female than male children.

Waterloo classification takes into account height for age and weight for height. In this

classification. children below 90% of the reference median height for age are classified as stunted and those below 80% of the reference median weight for height are wasted. Nutritional status is also evaluated by SD scores (Z score). In the Z score classification. -3SD is the cut off point for severe malnutrition (Stunting and wasting) and -2.99 to -2 SD represents moderated malnutrition.

Malnutrition in the children are the results of long sequence of interlined events. Inadequately dietary intake and disease are the most immediate cause of malnutrition. Disease especially infectious disease. affects dietary intake and nutrition utilization. The underlying causes can be numerous and usually interrelated. The underlying causes can be grouped under 3 main clusters: basic health services and healthy environment : house hold food security and maternal and child care. The declining trend in breast feeding. improper weaning practices with dilute formulas. starvation in diarrhoea. illiteracy. ignorance. Maternal malnutrition and close gap between pregnancies. unsafe water for drinking and other household use. lack of environmental sanitation. overcrowding. absence of proper hand washing after defecation. lack of immunization. helminthic infestations. unequal distribution of food and resources. communicable and non communicable disease. major micro nutrient deficiencies and lack of proper facilities to treat common disease of childhood by qualified physicians and many other factors are interrelated for the risk or cause of malnutrition in childhood.

Four countries in Asia. namely India . Indonesia. The Philippines and Thailand provide good examples of nutrition intervention programs to tackle PEM in young children (Lofti et al. 1990). The interventions include (De Onis et al. 1993) Growth monitoring and promotion (BBS. 1992). Breast feeding and supplementary feeding (World Summit for Children. United

Nations. 1990). Health and nutrition education and (4) Health services for severe nutritional

deficiencies (Maria et al. 1994). Food demonstration and home gardening (Cook et al. 1971).

Family planning services (Beaudry et al. 1973). Immunization. (Beghin et al. 1973). Supply of

micronutrients. Malnutrition is a result of intertwined political. socioeconomic. cultural and

health relationships in a given situation. A multisectoral. integrated" bottom up` approach

involving the community in all community intervention programs including problem

identification. intervention planning. implementation. monitoring and evaluation has been

emphasized for success of such programs.

In view of existing knowledge it may be previewed that malnutrition in children and infants

may be a consequence of multiple social and biomedical factors. UNICEF has recently

popularized the conception of three determinants such as lack of (a) Food security (b) Caring

practices (c) and disease control . In Bangladesh the process of child malnutrition status at

various of age. About 40% of new born have been reported to be low birth weight (LBW)

less than 2.5 kg. Most of them contribute to the bulk of malnutrition and early childhood

mortality. On the other hand infants of adequately birth weight either continues with better

health or deteriorate into malnutrition. It is conceivable that genesis of moderate malnutrition

may be the growth faltering of well nourished children. The third mechanism may the shifting

of severely malnourished children into moderately malnourished groups as they improve.

The consequence of malnutrition in childhood are very significant. Child hood retardation

in growth affect cognitive development. thereby school performance and quality of life.

Malnutrition of moderate grade is less obvious to identify and offer less attendant and

responded. Moderately malnourished children are also compromised in host resistance.

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therefore frequent suffering from disease is usual. That has economic and social cost on the family and counting as a whole. Malnourished children grows into malnourished adult who are in disadvantageous situation compare to healthy nations. Economic growth, physical quality of life index (PQLI) and progress is therefore largely dependent on nutritional status in early childhood.

From the past study it would be better to identify the specific causes and thereby design the remedial measure according. At the GMP session at CNCs may provide earlier weight of moderately malnourished children, it may not be completely able to identify the direction of genesis of moderate malnutrition. Yet the available record will be checked from CNC registration and attempts will be made to group the children into three categories.

The desired intervention would be starting nutrition counselling on aspects of best caring practices, disease control and food security to the target methods. But according to the trend of genesis of malnutrition, necessary components of counselling will be strengthened. This may be better approach to an individual counselling for a child and necessary materials emphasis on preventive or curative aspects.

Understanding of malnutrition by mothers:

A recent study done in Bangladesh showed that about 80% mothers can correctly identify malnutrition of their children. It has been shown in that study that 66% of uneducated (education 0 year), 74% less educated (education 0 - 5 years) mothers and 69% better educated (> 5 years) mothers correctly detected undernutrition. When weight for height (wt/ht < 80% meidan NCHS) was used as a indicator of malnutrition, mothers correctly identified malnutrition with a specificity of 79% (Roy et al 1993).

New understanding of malnutrition :

Understanding of the particular causes of malnutrition has been revolutionized in recent years, but these advantage of knowledge are as yet in inadequate translated into new policies. Briefly, it is now established that the great majority of malnourished children (other than those born with low birth weights) become malnourished in the period from birth to the age of two years, and that forward must be through prevention based on what are now recognized as the essential elements of good nutrition - adequate health, both of which depend on well informed and well supported care of the young child. Yet still today, the majority of efforts to combat malnutrition on which tens of billions of dollars are spent worldwide are abased on feeding programmes for who are over three years old. India's previously measured ICDS programme, for example, is reaching two thirds of the nation's children in an attempt to improve their health, nutrition and development; but it benefits mainly children between the ages of three and five and has therefore had little nutritional impact (CARE 1994). All existing programmes specifically aimed at improving child nutrition should now recognize that the task is one of preventing a child from becoming malnourished before he or she reaches the age of two.

This new knowledge and new understanding of nutritional issues must be translated into a wide understanding - among government ministries , planners health services, communities, and parents of the real nature of the problem. Without such a consensus on the causes of malnutrition, it is unlikely that there will be a consensus on the specific priority actions that are required.

Given progress towards equality for women, those priority actions could begin to make a

significant difference in the years immediately ahead. They could include, for example, a major effort ensure that all families and all health workers know the importance of better diet and more rest in pregnancy, of exclusive breast feeding during the early months of life, and of introducing the right kind of complementary foods in the right way and at the right time. Similarly, if people are to seen as the key actors in the process of improvement, then another obvious priority must be to increase access to today's information about how to protect normal growth. Communities need not only access to clean water, safe sanitation, and primary health care which remain a priority wherever these most basic of services into a reduced burden of disease.

In view of this situation the Government of Bangladesh recently initiated an integrated nutrition project (BINP) to address this major problem. The Ministry of Health and Family Welfare has initiated the project with the financial assistance of the World Bank. The project is the first recognition by the GOB, that investment in the nutrition sector can wake an important contribution to the development of human resources capital of the country. This project is the beginning of the long term effort of the Government aspirations expressed at the ICN of 1992 and the World Summit for children of 1990. The main conceptual basis of the project is threefold: Food availability, good health, and caring practices specially targeted to children and women. The main objectives of the project is to improve nutritional status of the people, national capacity building, community empowerment for action against malnutrition and to achieve measurable nutritional impact in the project areas.

The BINP project has three main components.

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1. National level nutrition activities with sub components of programme development and institution building. Information Education and communication development. strengthening of existing nutrition activities and project management. monitoring and evaluation.

2. Community based nutrition component (CBNC) to focus on growth monitoring and promotion activities and the modification of individuals for supplementary feeding at village level: and 3. Inter-sectoral nutrition programme development to improve nutrition through efforts beyond the scope of CBNC. through the emphasis of nutritional aspects of existing activities in various sectors (e.g agriculture) and the support of innovative actions with potential nutrition impact. Sub-project proposals from government and non-government organizations will be financed from inter-sectoral fund. The project has initially been implemented in six thana in the first year and thirty four thana are scheduled for the next 5 years. The main beneficiaries of this project are women of childbearing age and children under two years of age. The Government aims to establish an effective national nutrition programme to improve child survival. strengthen the demand of services. prevention of malnutrition in children. improve low birth weight. increase learning capability of children. healthier and more productive future generation.

Among the under-five children of non BINP thana. 7% are severely malnourished. 47% are moderately malnourished. 40% are mildly malnourished, and 6% are normal by Gomez classification (BBS 1992). The BINP food supplementation targets severely malnourished children and growth faltered children only. The report of Growth Monitoring in under two

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children of the current BINP thana shows an initial 18% severe malnutrition, and marked fall as a result of the BINP supplementation. This resulted in a relative increase in moderately and mildly malnourished children. The latest reports shows a fall of severely malnourished children to 3%, and 35% of moderately malnourished children. It is likely that some of the moderately malnourished children are growth faltering and would benefit by the BINP supplementary feeding. There is growing concern that in spite of reduction in severe malnutrition, a net increase in second degree malnutrition will continue compromise health and affect the quality of life. Therefore,

it is now recognized that a need exists to find an effective means to address the large segment of child population to restore a better nutritional status i.e. a graduation into mild or normal nutritional status. Once children are improved into that level, it needs to be maintained by sustainable means and a communities capacity. Therefore, the proposed operations research will involve a typical BINP area and explore possible effective and feasible interventions. For community and the parents, to address this issue, an understanding of the consequences of malnutrition and an ability to identify moderately malnourished children would be essential. It is possible to use a simple screening method of identification by using mid upper arm circumference with sakir tape, but this does not apply to infants under one year. The existing growth monitoring programe uses cards upon which weights are plotted monthly and can be easily used for identification and learning by the community and mothers.

Objectives of the study:

The major objectives of the study are to determine out the effective means to reduce the proportion of moderately malnourished children through the identification and effective family

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level means of appropriate feeding and nutrition education that these interventions should be feasible and sustainable with community participation.

Specific Objectives:

1. To identify an effective means to reduce moderately malnourished children

2. To determine and test dietary and nutrition education interventions that are effective and feasible at household level.

3. To determine methods to identify and understand the consequences of moderate malnutrition

Hypothesis

1. Supplementary feeding and intensive IEC at the community level will effectively reduce moderate PEM compared to the control children within 3 months .

2. Intensive nutrition education at the household level will reduce by at least one third of the prevalence of moderate malnutrition (40% of present level) within a short period of 3 months

Conceptual frame work:

It is assumed that current BINP supplementary feeding at the present level of energy and protein will be effective in severe malnutrition. The families of moderate malnutrition are from approximately the same population. hence the CNC unit would be addressed for organization of trial. two different interventions will be tested: The same as specific supplementary feeding as for severely malnourished children but with intensive IEC with home based feeding and caring practices in one group and b) and IEC with home based complementary feeding and caring practices. Aims would be to raise the levels of

understanding of the consequences of moderate malnutrition and effective mobilization of household food toward the moderately malnourished children . The third group will be from the usual CBNC area with no targeted action to moderately malnourished children and will serve as control. The IEC and village organization will be targeted to community awareness of malnutrition and need and means for effective intervention which can be sustained. The use of GMP cards will enable them to identify moderately malnourished children.

Material and method

This research project will be conducted in Sharasti thana in Chandpur district of Bangladesh. This is a BINP-operated thana where the NGO, BRAC is directing the project activity with the help of Government. The basic information, already existing in the registrar (eg. anthropometry) of the CNP will be reviewed with BRAC permission.

A village nutrition committee will be formed at the outset of the study to discuss the objective of the study, the level and types of input that can be mobilized will be planned. A local volunteer will be identified to work for the project selected by the village nutrition committee. A women's group will meet to plan their time and availability for demonstration and advocacy of measures undertaken for the research projects. The proportion of activity that can be channeled through the CNP and time available for the CNP will be determined. The moderately malnourished children will be registered with the help of the CNP registrar and GMP cards. The proportion of moderately malnourished children with growth faltering and who are receiving supplementary feeding will be identified.

Design of the project:

This will be a prospective study. It is proposed that there will be two intervention groups and one control group in context of the CBNC programe. The project will select children under two years who participate in routine growth monitoring as a part of the BINP. In the current BINP. growth faltering children and severely malnourished children are identified and given a daily food supplement for 6 days a week under direct observation at a feeding centre. The supplement contains roasted powder of rice 40 g. roasted powder of dhal 20 g. molasess 10 g and soya oil 6 g per feed. This contains about 150 kcal. Growth faltered children are fed one packet and the severely malnourished children age fed two packets in the CNC. In our proposed study. there will be three groups :

(1)   One intervention group of moderately malnourished children but without growth faltering will receive intensive counselling and demonstration of appropriate complementary feeding at home and caring practices.

(2)   The second intervention group will be moderately malnourished infants/ children without growth faltering who will receive supplementary feeding of one packet of the routine BINP feeding as used in CNC and intensive counselling on home feeding and caring practices.

(3)   Control group will consist of the moderately malnourished children through GMP and will not receive any intervention.

Details of the nutrition counselling and demonstration of food are given in annex 1.

The base line weight. length and weight for age of each child will be recorded. Every child will be counselled once a week. and weight and length will be taken in each month for a

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period of three months. Information will also be taken from the GMP sessions and by a project worker. A women's support group will be given a lesson plan and trained for the counselling. The sessions with moderately malnourished children and their parents will be organized in consultation with VNC for at least once a week along with the VNC and IEC worker if available. The counselling will be a pictorial or written script in Bangla. A session will be planned for increasing the ability to recognize moderately malnourished children. The feasibility will be seen through exploratory meeting with VNC and moderately malnourished children's mothers. Data collection forms will be developed for easy entry into microcomputer for quick results.

Sample size calculation:

Sampling frame:

The study subjects will be under 2 years of age and be recruited from the growth monitoring programme at CNC. Of the total population about 4.5% are under 2 years at a given time. From this population about 10% show growth faltering and come to the CNC for supplementary feeding as the part of the BINP. Under 2 years, about 37% are in moderate grade of malnutrition, about 30% in mild malnutrition, about 30% normal and about 3% are in severe malnutrition in the BINP operation thana according to BINP present office information (BINP personnal communication).

In each CNC about 18-20 children are expected to have moderate degree of malnutrition.

The assumption is that there will be 0.3 difference in proportion moving to moderate malnutrition in the intervention group receiving nutrition education

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Using formula $n = (z_\alpha + z_\beta)^2 \times 2 \times pq$

$$\overline{}$$

$$d^2$$

Reference:

G W Snedecor and WG Cockran. Statistical Methods in Medical sciences. Oxford Publications 6th edition 1968. pp 111-114.

p=proportion. q=1-p. p=0.5 for maximum needed sample size .

pq=0.25

where z_α = level of signiufcance at 5% . =1.96

and z_β = power of the study 90%. =1.28

where d= difference of proportion moving to mild malnutrition between control and intervention group.

$$n = \frac{10.5 \times 2 \times 0.25}{(0.3)^2} = 58.$$

taking a cluster effect of the design as the children will be selected from CNC s this is increased to 58 X 1.5= 87. with a drop out possibility of 10-15%. it will be about 100 children in each group..

Total sample size will be 100 X 3=300

Selection and randomization procedure:

The required sample size is 300 moderately malnourished children. In each CNC 18 to 20

moderately malnourished children under 2 years will be available. About 5 CNCs will be necessary for each group of 100 children. Therefore a total of 15 CNC areas will be required for the study.

The study will be conducted in Shahrasti thana in Chandpur district. There are seven unions in Shahrasti thana. From these 7 unions, 3 will be randomly selected to get approximately 30 CNCs. All CNCs have unique identification number for the thana. From these 30 CNCs, 15 CNCs will be primarily identified alternatively in order to avoid influence of intervention methods. Identified 15 CNCs will be randomly allocated by their identification numbers to one of the three study groups. This will cover a population of approximately 25,000 for one control and two intervention groups.

Data collection method

For 2 CNC covering area, 1 health assistant (preferably graduate level having recognized ability to communicate with village mothers) will be appointed to collect the data. There will be two Supervisors (Senior and experienced) with nutrition background to continuously organize and enforce the nutrion counselling on child feeding practices and caring practices. One sociologist will be appointed to train and guide the health assistant. She will also participate in counselling on child feeding, caring practice and focus group discussion. The base line survey will include data collection on basic feeding pattern at home, family income and food status, education and profession of the parents . Data will be collected on past illness, birth history, birth weight if possible, plan for child feeding, knowledge on child feeding and dietary preparation, allocation of time for child care, breastfeeding frequency, complementary feeding, frequency of feeding, practice of medical care , willingness to

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change. Morbidity history will be recorded at two weekly intervals. A pretest of knowledge of child feeding practice will be repeated with same questionnaire after the diet counselling sessions with the mothers. Data on feeding frequency, preparation of child feed, addition of ingredients will be recorded at two weekly intervals in each study group. Post test will be collected at the end of three months counselling.

Observational data will be collected on practice of preparation and feeding and caring practices of the mothers.

Anthropometric data will be collected from the GMP sessions. A base line clinical assessment of deficiency signs of micronutrients will be recorded by a project physician. Data on compliance level of nutrition counselling will be collected during 2 weekly observation period. Data on causes of noncompliance will be also recorded. Changes in family feeding frequency and changes in dietary composition will be recorded. In the intervention area, supplementary food will be prepared by the women support group and the feeding will be planned in CNC for initial one month and then it will be maintained at home with supervision of the women support group. Data of dietary intake and noncompliance will be collected. Failure to receive treatment at FWC will be backed up by project physician.

Focus group discussion:

A Focus Group Discussion (FGD) is an unique method of qualitative research that tries to find the views of people in a group through an interactive way. FGD will be conducted with the mothers to learn about their perception and practices on child feeding and dietary pattern.

Rationale: As malnourished children are often suffered from various infectious disease due to their low immunity. So it is likely that moderately malnourished children are also prone to

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susceptible to infectious disease. By providing them information and thus improving their knowledge is perceived to bring the change in practice and attitude and the behavior as a whole. This will solve the problem of moderately malnourished children. It is necessary to involve immediate care takers of children, (mothers or guardians) to the problem and initiate remedial measures with the help of their own resources that they can take from their environment. We are expecting that FGD will bring out:

1. Perception, causes, possible consequences of malnutrition from mothers that they experience in their day to day life.

2. Ideas on the management of the problem and its preventive and curative measures.

3. The perceptions on food security of children like feeding practice and pattern and frequency of breast feeding.

4. Mothers' perceptions about initiative for immunization.

The views expressed by the mothers through Focus Group Discussion on possible causes of malnutrition and their suggestion on the preventive and curative measure will be used as base line data to prepare the material for counselling mothers on nutrition related behavior change project.

Methods:

FGD will be conducted on mothers in 6 groups each from 3 CNCs (1 control and 2 study areas). There will be 8-10 mothers of moderately malnourished children in each in each Focus Group Discussion. This is expected to be more or less homogenous as the age range will not vary since mothers having young children in the villages are commonly younger. FGD will be conducted / assisted by the sociologists or research assistants. Several topics related to

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malnutrition will be asked to the FGD participants of the groups. Discussion will be facilitated by the research personnel but they will not influence the discussion. They will play the role of guiding the group on the right topic by putting them on the track. FGD will try to reveal the consensus on:

perception on malnutrition.

how they identify malnutrition?

why malnutrition occurs?

What are the consequence of malnutrition?

How moderate malnutrition can be overcome ?

The FGD will be conducted 2 hours for each groups. The research personnel will record all the answers in several broad categories. The qualitative answers will then be transformed into quantitative expression to help analysis to use these information.

The FGD will be conducted later again to evaluate the change in behavior and the process indicators. In the same way the method indicated above will be followed the later part of the study as well.

Collection of morbidity data: It is expected that all three groups of subjects drawn from the similar geographical and socioeconomic back ground will face a comparable risk of morbidity from common infectious diseases. Yet it will be necessary to have an acceptable estimate of the frequency and duration of morbidity in three groups of subjects. To understand the role of morbidity, morbidity information will be taken at 2 weekly interval during study period. A card will be developed to facilitate the mother as morbidity diary with symbols of common diseases and boxes for days and dates for each week period. Mothers will be demonstrated

how to give a mark on days of illness. Each card will be devised in two colour for first week and second week. At the end of the second week, card will be collected and record of the recall will be verified. A new card will be provided for next fortnight. In the mothers counselling sessions the demonstration and understanding of the card will be elaborated. This can be a useful education tool for encouraging mother on further attention to children's illness.

Outcome variables:

1. Weight and length to assess nutritional status of the children

2. Mothers understanding and ability to identify moderate malnutrition in children.

3. Mothers understanding on consequence of moderate malnutrition

4. Change in knowledge of mothers in feeding practices

5. Frequency of home feeding (Breastfeeding and supplementary feeding)

6. Frequency of medical care during illness

Process indicators:

1. Number of counselling sessions

2. Proportion of attendance by mother to counselling session

3. Proportion of attendance of supplementary feeding demonstration session

4. Number of home visits of by Health assistant

5. Number of recorded morbidity

6. Use of IEC materials in sessions.

7. Number of community sessions with women's group, VNC etc.

Quality control measures:

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Systematic data collection will be directly supervised by the project investigators in 25% random cases. Anthropometry will be standardized at the beginning of monthly session by trained nutritionist and project supervisor. Feeding frequency will be rechecked after the day of interview in 25% of the randomly selected sessions at the household levels. Principal investigator will check the data collection at 2 weekly intervals and record check at every 10th file. With identification of any discrepancy, the data will be informed to the respective health worker and assisted by supervisor to correct. Each child will have a record file of events and will be kept with project self holder. The field activity will be communicated to PI by the project manager by phone, fax and messenger, in between the visits in the field. Data will be checked by programming in computer after collection and before analysis.

Data analysis plan

Data will be checked at collection period, quality will be ensured by computer programs and there will be descriptive study on socioeconomic status, feeding pattern at baseline, analysis of determining factors by using multiple regression and relative risk analysis. Effects of intervention on outcome variables as grade of nutrition as weight for age, weight gain per unit body weight, will be compared between study groups and control group. Confounders of weight gain will be adjusted by logistic regression and multiple regression.

Analysis of characteristics of compliance will be done. Dropout will be tested for difference in character. Data analysis will identify the factors required for mobilization of family resources.

Ethical implications:

There will be no ethical problem as per harm to the children. But parental consent will be

taken after informing them the objectives of the study.

It may be necessary to give medical treatment for severe illness .it will be done. Severe growth faltered will not be a part of the study.

Scope of consultants: Consultants will be identified with background of sociology. experienced with community research on behavioral interventions. experience in nutrion education and skilled in data analysis with qualitative research. There may be more than one consultant and appointed on the basis of their required duration.

Significance of the study

Moderately malnourished children often reflects chronic malnutrition and slow growth. As the proportion of moderately malnourished children make up the majority of children under two years of age it will be most important to target these children to ensure a healthier child with normal nutrition. At present there is no systematic means to address them. This study will try to determine an effective sustainable strategy that can be implemented by the community to combat moderately childhood malnutrition.

Collaborative arrangement

The investigator will be from BRAC and ICDDR.B that will help operation of the project. The investigators from BRAC are experienced with BINP community based nutrition component (CBNC) and knowledgeable on the current operation at the proposed thana. The collaboration includes assistance in training. and IEC distribution. organization of local support group. women group. community nutrition promoter and CNO help in regular monitoring and quality control.

Detailed Budget (Taka)

Personnel	%effort	no	period	man-month	rate/mo	total
Principal Investigator	20%	-	6mo	1.2	80.000	96.000
Coinvestigators	5%	2	6mo		40.000	24.000
Sociologist	100%	1	6mo		6.500	39.000
Nutritionist	100%	1	6mo		6.500	39.000
Supervisors	100%	2	6mo	12	5.000	60.000
Physician	100%	1	6mo	6	8.500	51.000
Health assistants	100%	8	6mo	36	3.000	144.000
Peon/guard	100%	1	6mo	-	2.500	15.000
Clerk	100%	1	6mo	-	3.500	21.000
Honorarium for Field visit		12	5mo	--	500	6.000
Consultant's fee		5	5mo	--	5000	25.000
Communications. phone fax			5mo	--	7000	20.000
Transportation						
Local						15.000
Dhaka and project site						20.000
IEC materials						30.000
printing						10.000
Data analysis						30.000
Publications						10.000
Stationeries						15.000

Supplement food cost	100	2.5 X 24X 3 X 100	18.000
Local community support			35.000
Drugs	300		8.000
Office rent	m	2000	12.000
Office furniture. cabinet			25.000
Dissemination seminars			50.000
			————————
			8.18.000
Total Direct Cost			
Indirect cost 10%			81.800
			————————
Total Project cost			899.800

Annexure 1: **Nutrition and health education:**

1. To show the mothers how to prepare complementary food at home. which will be the same as given in CNC by CNP. essentially roasted rice powder (40g). roasted pulse powder (20g) molasses (10g) and oil 6 gms about one teaspoonful at the time of thoroughly mixing these ingredients while water has to be added to make consistency from thick to liquid according to each child preference. Older child likes more thick and younger one like the liquid ones.

2. Food cooked in the family are taken to gather as cooked rice. dhal potato. vegetable fish or egg as available. thoroughly mixed and added extra oil about 1 teaspoonful and feed such many as 4-5 times a day.

3. Cleaning and identify a plate for the child will been necessary. quantity of food will be shown according to age of the child.

4. Breastfeeding would be reinforced to continue upto two years with as many times as possible suckling.

5. Caring practice would include encouragement to the child to play and have attentions as soon as child demands. attention to child desire will be given by other members of the family

6. Caring practice would include washing and bathing as required.

7. Mother will be given assistance to disease control. such as immunization at time. preventive care for cold . taking to health care at FWCs as soon as there is ARI or high fever. give ORS as soon as diarrhoea is seen.

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Memorandum

To   : Dr. S.K. Roy   August 20, 1998

From   : Prof. V.I. Mathan
             Chairman, RRC

Subject   : **Approval of your protocol # 98-019 entitled "Effective means to address moderately malnourished children within BINP communities"**

Please be informed that the above protocol has had BINP system of reviews, and the RRC has **approved** it in lieu of external reviews.

Thank you.

Cc: Director, CSD

CENTRE
FOR HEALTH AND
POPULATION RESEARCH

Memorandum

To   : Dr. Rubina Shaheen   August 20, 1998

From   : Prof. V.I. Mathan
                Chairman, RRC

Subject   : **Approval of your protocol # 98-018 entitled "A cohort study to estimate the
                optimal duration of nutritional supplementation for malnourished pregnant
                women and its impact on birth weights on newborns"**

Please be informed that the above protocol has had BINP system of reviews, and
the RRC has **approved** it in lieu of external reviews.

Thank you.

Cc: Director, PHSD

CENTRE
FOR HEALTH AND
POPULATION RESEARCH

Memorandum

To   : Dr. Mahmud Khan   August 20, 1998

From   : Prof. V.I. Mathan
              Chairman, RRC

Subject   :**Approval of your protocol # 98-017 entitled "Costing of BINP activities at the community level"**

Please be informed that the above protocol has had BINP system of reviews, and the RRC has **approved** it in lieu of external reviews.

Thank you.

Cc: Director, PHSD

INTERNATIONAL CENTRE FOR DIARRHOEAL DISEASE RESEARCH, BANGLADESH
Mail : ICDDR,B, GPO Box 128, Dhaka-1000, Bangladesh
Phone : 871751-60, Telex : 675612 ICDD BJ
Fax : 880-2-883116, 886050, 871568, 871686, Cable : Cholera Dhaka

CENTRE
FOR HEALTH AND
POPULATION RESEARCH

Memorandum

To   : Mr. M.A. Wahed   August 20, 1998

From   : Prof. V.I. Mathan
              Chairman, RRC

Subject   :**Approval of your protocol # 98-016 entitled "Development of nutrient dense
              supplementary foods for malnourished children"**

Please be informed that the above protocol has had BINP system of reviews, and
the RRC has **approved** it in lieu of external reviews.

Thank you.

Cc: Director, LSD

CENTRE
FOR HEALTH AND
POPULATION RESEARCH

Memorandum

To: Chairman   Date: August 20, 1998
Research Review Committee

From: Dr. S.K. Roy

Sub: RRC clearance for the protocols of BINP OPRP by Principal Investigators of
ICDDR,B

This is to draw your kind attention that the following projects have been awarded to
the ICDDR,B investigators through competitive process of BINP Operations Research
Project. These projects have been thoroughly reviewed by competent national and
international reviewers and thereafter the Final Award Committee of BINP OPRP
approved the projects. These projects will be treated as internal regular projects of
ICDDR,B.

In the above circumstances, I would request you to please accord your approval to
these projects so as to enable us to start the study as early as possible.

The description of the projects are as follows:

1.   Costing of the BINP activities at the Community level (PI: Dr. M. Mahmud
       Khan).

2.   A cohort study to estimate the optimal duration of nutritional supplementation
       for malnourished pregnant women and its impact on birth weights of newborns
       (PI: Dr. Rubina Shaheen).

3.   Development of nutrient-dense supplementary foods for malnourished children
       (PIs: Mr. M.A. Wahed & Ms. Shaheen Ahmed).

4.   Effective means to address moderately malnourished children (PI: Dr. S.K.
       Roy).

Thank you very much for your assistance and cooperation.