

Measuring and Managing Protein Energy Malnutrition in rural communities

4 The Intervention

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INTERVENTION PROGRAMMES

INTERVENTION PROGRAMMES on the health of young children in developing countries — are they justified?

There is no question about the need for extra care for children in preference to adults as a disproportionately large percentage of total deaths occurs at the young ages,²¹ (more than one third in developing countries, well under 5% in industrialised countries²¹). Thereby healthy child development is important for effective physical and intellectual performance in later life²¹. Evans *et al* found a deficit in intellectual maturity by children who had an episode of kwashiorkor that occurred after 16 months of age¹⁴. He also stated that dietary supplementation of newborn siblings in families with a known history of undernutrition significantly elevated intelligence test scores of the supplemented children above that of their siblings¹⁵.

If there is a place for health and nutrition programmes, are they successful enough to control malnutrition? Gwatkin *et al* conclude that health and nutrition intervention can make a difference²¹. They evaluated 10 intervention programmes which must not be considered

as the best programmes but the best to evaluate. To estimate the efficiency of these programmes, Infant Mortality, Fertility Rate and Physical Growth were assessed.

In all the programmes a strong decrease in infant and child mortality was found. In seven of the nine cases there was a control group. In the intervention areas the decrease was more significant than in the control group. With respect to fertility five of the ten projects provided data adequate to permit trend estimates. In three out of four projects there was a substantial decline in birth rate after offering family planning services in close conjunction with nutrition and health efforts. In the fourth project it was not clear whether the decline was more than in the control area. In Imesi¹⁰ the fertility rate after five years of the initiation of projects was found to be higher than in the control area²¹. Five of the six projects which attempted to stimulate physical growth had at least some results. In only one, no significant difference between treatment and control area was found²¹.

Thereby the costs were quite moderate, only 0,5 to 2 % of the annual per capita GNP which are very close to the health expenditure levels for most developing countries for the conventional national health system that reaches far less people²¹. In order to lower the costs and to enhance consumer participation and responsibility, the community could also contribute to the expenditures²¹. In all the ten intervention programmes, certain measures seemed to be strikingly effective²¹; for instance:

- nutritional supplements for mothers
- immunising mother against tetanus
- registration of nutritional status to identify growth problems and to bring these to the attention of the mother, seem very effective in decreasing mortality rates
- improved nutrition for both mother and children
- intensive and continuous training of fieldworkers (on the job)
- more reliance on para-medical workers
- to reach the whole population with the intervention programme (important for Vaccination)²⁹.

The most effective intervention seems to be a mixture of both nutrition and health interventions but one cannot prescribe the ideal intervention as flexibility is necessary for local needs²¹.

The Under Five Clinics, as defined by Morley, however give more or less a schedule for an intervention programme. According to Morley⁴¹, the UFC should have three goals:

1. To check the health of all children < 5 years.
2. To prevent malnutrition, malaria, measles, whooping cough and TB.
3. To provide simple treatment for diarrhoea, pneumonia and the common skin diseases.

It has to give curative and preventive services to a population as large as possible. After an under five clinic was put up in Imesi (Nigeria), Cunningham compared the health and nutritional status of children in Imesi with children from a neighbouring village, Okemesi, where there was no under five clinic¹⁰. He concluded that the clinic in Imesi, where the services were very extensive

and effective, was the primary factor to which the superior health of the Imesi under five children could be attributed¹⁰. Infant and child mortality can be seen as an indication of the efficiency of intervention programmes²². The mortality rate of children 0 - 5 years old in Imesi came down to one quarter of the previous number over a period of ten years, which, according to Morley, can be achieved only by curative and preventive care together⁴¹. The 1 - 4 year child mortality rate at Imesi was 18,0/1 000, at Okemesi 51,2/1 000¹⁰. In Imesi only half of the children in comparison with Okemesi were under 60 % of the mean weight for age¹⁰.

These results are very encouraging and for this reason under five clinics should be available for all children.

A schedule of objectives and activities needed for the control of protein-energy malnutrition in young children is given by Standard². (See Table on next page).

It is stressed that an increase of food production and improvement of environmental sanitation together with health education at both national and community levels are of paramount importance².

Children with protein energy malnutrition can be considered as a 'high-risk' group, but more children need special attention as they have some characteristics which place them in an 'at-risk' group. Morley defined some at risk factors which were found to be significant in a West-African Village⁴¹.

- maternal weight below 43,5kg
- all birth orders over 7
- breakdown of marriage or death of either parent
- death in the family of more than four siblings
- a birth weight below the third percentile (boy 2,45 kg; girl 2,36kg)
- failure to gain 0,5kg a month in the first trimester or 0,25 kg a month in the second trimester of life
- breast infection and difficulties in breast-feeding, particularly those secondary to psychiatric illness in the mother
- an episode of measles, whooping cough and severe repeated diarrhoea in the early months of life.

But one might consider other at-risk factors as well, like

- twinning
- any significant problem in the neonatal period
- any obvious congenital abnormality
- households with TB
- mother less than 16 years old
- mother returning to work or school
- mother having a serious physical or mental illness
- known malnutrition in the family
- known domestic or economic crisis in the family
- any infant falling below the third percentile on growth chart
- any infant falling away from his previous normal growth line
- any child not showing satisfactory catch up growth after any illness.

THE INTERVENTION PROGRAMME IN GELUKSPAN HEALTH REGION

After the data of the nutrition survey was collected in 1980, a programme was started by the Gelukspan Community Hospital.

Supplements used in the feeding programme

Amount and supplement issued monthly	Age Group	Percentage of the daily need of protein	Percentage of the daily need energy	Costs — monthly
1 kg Full Cream Milk Powder NPU = 75 %	0-11 months	46,5	20,1	R2,67
1,5 kg Skimmed Milk Powder NPU = 75 %	12-35 months	75,0	14,0	R2,04
45 kg Peaflour NPU = 45 %	36-71 months	60,4	23,3	R1,23

*NPU of Peaflour is much higher when it is combined with maize (70 %).

The Team had the following equipment at its disposal:

- Toyota Hi-Ace Ambulance
- Two scales (Salter scales on tripod).
- Tape measure (Shakir strip)
- Cool boxes & Vaccines
- Road to Health Cards
- World Vision Cards
- Immunisation Cards
- Plastic bags in which to keep cards
- Skimmed Milk Powder (1,5 kg bags)
- Full Cream Milk Powder — 500 mg packets
- Peaflour — 4 kg packets
- Multivite syrup

Later on the team included the following medicine:

- INH
- Whitefield ointment
- Ascabiol
- Ferlucon

Doctors of the hospital were sent out with the team on several occasions to evaluate the progress of the children on the feeding programme, usually at intervals of three to four months. Regular in-service training was given to the team members and also training on the job.

2. Gardening and poultry projects.

In October 1980 gardening and poultry projects were started at the hospital. Seedlings and seeds of cabbage, tomatoes, beetroot, onions, spinach were sold at cost price.

The poultry project serves to supply four to six week old chickens to the people at cost price. Most of the chickens are sold in the district by the mobile under-five clinic to the mothers of (malnourished) children. People are encouraged to bring them up for egg production and to slaughter only the cockerels. Every two months 1 500 chickens are distributed in the community in this way. Individual mothers were advised how they could help themselves e.g. by milking their goats, eating peanuts, production of their own eggs and meat etc.

3. A nutrition rehabilitation ward was opened in January 1981.

The idea was to admit the malnourished children with their mother or guardian

Indication for admission

- if the child is badly malnourished on the first visit e.g. very marasmic or edematous
- if there is no improvement while the child is on outpatient treatment
- for further investigation e.g. TB contacts, anaemia, when children lose weight without obvious reason etc.

On admission the following routine investigations are done:

- CXR
- Mantoux
- FBC + ESR
- Urine and stool microscopy

Other tests like LFT, U & E, urine and blood cultures are only done when indicated.

The ward has a special menu with extra meals in between and the lunch is enriched with sunflower oil (mixed in maize porridge). In the evening some of the mothers cook for all the children.

For the mothers there is a special programme and they are involved in the care of the child as much as possible. Besides that, they look after their child and have daily health education lectures (list of 15 topics for a three week programme). There are practicals e.g. making of oral rehydration fluid, gardening, knitting, cooking etc.

IV. In addition to the abovementioned projects the health service as a whole was decentralised as far as possible.

In 1980 and 1981 new clinics were built at Kraaipan, Madibogo and Ganalaagte. The mobile clinic visited new places like Vrisgewacht and Mofufutso. The TB case-finding team continued its work and there was a mobile X-ray project in 1981. The health inspector and medical students made a survey in 1981 of all the available water sources. They assessed the quality and where possible the quantity of available water. Communities were advised on safe water supply and sanitation. A big health education programme in the schools was organised by the health inspector and some nurses later in 1981, concentrating on safe water supply and the prevention and treatment of diarrhoea at home.

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TABLE 1

Levels of prevention	Objectives	Activities	Started at Gelukspan
I. General	to raise standards of living, to develop food policy and agriculture, and to improve fundamental education and environmental sanitation.	Development and implementation of plans for improving the socio-economic level of the less privileged groups of the population.	
II. Specific health promotion	to maintain good nutritional status.	(1) protection of nutritional status of pregnant and lactating women, health education, supplementary foods.	X
		(2) periodic surveillance of population at risk	X
		(3) promotion of breast feeding	X
		(4) development of low cost weaning foods and of measures to improve family diet.	X
		(5) development of nutrition education in co-operation with agricultural extension services, schools.	X
		(6) expansion of immunisation programmes	X
Health protection	To reduce prevalence of infectious diseases	(7) promotion of hygienic preparation of food and personal hygiene	X
		(8) provision of domestic utensils suitable for infant feeding.	X
Treatment and rehabilitation	to minimise the effects of infectious diseases	(9) intensification of simple programmes for early rehydration of children with diarrhoea.	X
		(10) intensification of food distribution programmes in times of epidemics.	X
		(11) deworming of heavily infested children	X
	to achieve the early and complete nutritional rehabilitation of malnourished children	(12) hospitalisation of serious cases	X
		(13) ambulatory treatment of moderate cases	X
		(14) treatment through nutrition rehabilitation programmes.	X

The programme consisted of different parts which were not implemented at the same time.

1. A mobile under five clinic (July 1980).

A team was formed by:

- 1 Psychologist, with interest in community involvement
- 1 Health Assistant
- 1 Family Planning Guidance Officer
- 2 Staff Nurses
- 1 Medical Student (first two months).

Task of the Team

- to weigh and immunise all children under the age of six years.
- to issue all these children with a Road to Health Card (home based in plastic bag).
- to screen out all children at risk and follow them up with extra care eg. extra health education and visits.
- to screen out all children with severe malnutrition; under the age of 12 months the weight for age was used as criterion. After 12 months up to 60 months a mid-upper arm circumference of less than 13,5cm was regarded as cut-off point for severe malnutrition. As many as possible of these children had to be treated at home, issued with food supplements and follow-up monthly.
- to issue monthly to malnourished children: under the age of 12 months — 1,5 kg full cream milk powder; from 12 to 36 months — 1,5 kg skimmed milk powder and above 36 months — 4 kg peaflour was given monthly.
- to see and weigh all the malnourished children once a month.
- to give health education to the mothers as a group but also to individuals.

- to inform and advise the mothers on family planning and child spacing
- to refer people with social problems to the social workers.

The team discussed the whole project first with the community leaders in each village. The co-operation was sought of clinic nurses, clinic committees, tribal authorities, teachers, ministers, women's league, traditional healers etc.

All communities agreed that the team should come and screen their children except one small village near the hospital.

The first round took nearly four months and more than 11 000 children were seen. After the first round the programme was adjusted in such a way that the healthy children were seen once in four months by the mobile team and the malnourished children monthly (at the twelve district clinics). The malnourished children and some at risk children got supplements and a yellow World Vision Card which is their passport to obtain the monthly supplements. A register was kept for all children who received food supplements. The children at risk were advised to visit the UFC more frequently than other children.

The daily protein and energy needs according to King²⁸ are:

	Reference Protein	Energy (UG)
Child below 1 year	14 gr	3400
Child 1 - 3 years	16 gr	5700
Child 3 - 6 years	20 gr	7600