

Supplementary feeding of malnourished children in northern Iraq

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الإطعام التكميلي للأطفال المصابين بسوء التغذية في شمال العراق

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الخلاصة: تم تقييم فعالية برنامج الإطعام التكميلي للأطفال المصابين بسوء التغذية وأ الذين تراوح أعمارهم بين 6 شهور و3 سنوات في محافظة دهوك شمال العراق. وقد كانت معايير إدراج الأطفال في الدراسة أن يكون وزن الطفل أقل من الوزن المعياري بالنسبة للوزن بمقدار انحرافين معياريين أو أكثر. وقد بدأ إدراج الأطفال في البرنامج منذ كانون الثاني/يناير 2001 وتمت متابعتهم على مدى 7 شهور وكان الأطفال يتلقون البسكويت الغني بالبروتين والطاقة في الشهر الأول، ثم يعطى كل طفل حصة شهرية لتحضير مزيج فوق الصويا طيلة الأيام التالية. وكانت أسر هؤلاء الأطفال تتلقى حصص الطعام في الأشهر الأربعة الأولى. وقد لوحظ تحسُّن لدى جميع الأطفال ولاسيما في الشهر الأول. وقد ظهرت المشكلات في الحصص وفي وحدات رصد نمو الأطفال مما أدى إلى قدر كبير من تسرب الأطفال من الدراسة. وقد يكون استخدام بطاقتهم معيارية أحد طرق التغلب على هذه المشكلات، وينبغي توزيع البسكويت الغني بالبروتين على نطاق واسع بدلاً من مزيج فول الصويا.

ABSTRACT The effectiveness of the supplementary feeding programme for malnourished children aged 6 months to 3 years in Dohuk province, northern Iraq was evaluated. The enrolment criterion was child weight ≥ 2 standard deviations below standard weight-for-age. Children enrolled in the programme in January 2001 were followed over 7 months. Children received high-protein high-energy biscuits in the first month and a monthly child ration for preparing soyabean mix throughout. Their families received food rations in the first 4 months. Improvement was noticed for all children, particularly in the first month. Problems with the rations and within the growth monitoring units resulted in significant drop-out. Use of standard growth charts may be a way to overcome this problem. High-protein biscuits should be distributed throughout instead of the mix.

L'alimentation supplémentaire des enfants malnutris dans le nord de l'Iraq

RESUME L'efficacité des programmes d'alimentation supplémentaire pour les enfants malnutris âgés de 6 mois à trois ans dans la province de Dohouk (nord de l'Iraq) a été évaluée. Le critère d'admission était un poids de l'enfant en dessous du rapport poids-âge standard de 2 écarts-types ou plus. Les enfants inscrits au programme en janvier 2001 ont fait l'objet d'un suivi pendant sept mois. Les enfants ont reçu des biscuits à haute teneur protéinique et énergétique pendant le premier mois et une ration mensuelle pour la préparation d'un mélange de graines de soja pendant toute la période. Les familles ont reçu des rations alimentaires pendant les quatre premiers mois. Une amélioration a été notée chez tous les enfants, notamment au cours du premier mois. Des problèmes avec les rations et au sein des services de surveillance de la croissance ont entraîné d'importantes défections. L'utilisation de courbes de croissance standard peut être un moyen de surmonter ce problème. Des biscuits à haute teneur en protéines devraient être distribués pendant toute la période au lieu du mélange.

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Introduction

Improvement in the nutritional status of young children reduces morbidity and mortality [1,2]. Recognizing this fact, in 1994 the World Food Programme, in coordination with UNICEF and the directorates of health in Northern Iraq, initiated a supplementary feeding programme (SFP) for children under 5. Since then the programme has been evaluated through a nutrition surveillance system set up in all the primary health care centres involved in the SFP as well as through UNICEF-sponsored Regional nutrition surveys conducted every 6-12 months [3]. This study is aimed at the evaluation of the SFP in Dohuk province.

Methods

The study was conducted at the primary health care level under the supervision of the Directorate of Health and UNICEF. After the simple random selection of 9 (15%) of 62 primary health care centres which have growth monitoring units, the evaluation study started in Dohuk province on 1 January 2001. Two of the 9 units were located in urban areas, the rest in rural areas. The growth monitoring staff of these centres, plus 1 supervisory mobile nutrition team, were retrained in a 3-day UNICEF-sponsored course. Retraining of growth monitoring staff is a routine process, done almost every year.

The SFP routinely consists of assessing the nutritional status of children aged 6 months to 3 years according to weight-for-age criteria. Children are weighed wearing light underclothing and without shoes. Readings are taken to the nearest 100 g. Standard scales, model MP25, were supplied by UNICEF. If weight is ≥ 2 standard deviations (SD) below the standard weight-for-age, then the child receives a weekly

ration of high-protein high-energy biscuit (0.8 kg/week) for the next month. The biscuit contains wheat flour, soyabeans, glucose, vegetable oil, multivitamins and minerals. At the same time, the child is registered to receive, over the next 7 months, a monthly child ration of 5 kg soyabean flour plus vegetable oil (0.6 kg) and sugar (0.6 kg) for making a high-protein high-energy mix. The family should, theoretically, also receive 4.5 kg vegetable oil, 3 kg sugar, 3 kg pulses and 13 kg rice monthly. This family ration is for the first 4 months only. Food rations are received from a ration agent and not from the growth monitoring unit.

At least once monthly, before distributing any rations, the staff of the growth monitoring unit should see all the children who are enrolled and record follow-up information, in particular the child's weight. Staff are also supposed to give health and nutrition education to the mothers. The supervisory team and the author monitored and supervised staff throughout the period of the study.

Height was measured for every malnourished child enrolled in this study (if a child's weight is ≥ 3 SD below standard weight-for-age, height is measured routinely). Children < 2 years were measured lying down, and those ≥ 2 years were measured standing, all without shoes. Shore infant/child length/height measuring boards supplied by UNICEF were used. Readings were taken to the nearest 0.1 cm. If weight is ≥ 3 SD below standard weight-for-height, then the child is referred to a hospital nutritional rehabilitation centre and admitted and given therapeutic milk plus medical care.

During the current evaluation study, the growth monitoring staff were requested to routinely record monthly height measurements for every malnourished child en-

rolled in the SFP according to weight-for-age criteria.

Weight-for-age, weight-for-height and height-for-age standards used were those of the World Health Organization [4,5].

Another aspect of the current evaluation was a 1-month field trial to study the increase in the weight of a sample of 27 malnourished children who were receiving high-protein high-energy biscuits. They were compared with 27 normal control children in the same age range (6 months to 3 years). The control children were visiting the primary health care centres for routine immunization or growth monitoring. Participants were selected by taking the first 3 malnourished and the first 3 healthy children who presented to the primary health care centres involved in the study after 20 June 2001. Informed consent was obtained orally from parents, and there were no refusals. After 1 month, 2 malnourished children and 3 controls were lost to follow-up. Unpaired *t*-test for 2 independent samples

with unequal variances (*SPSS*, version 10) was used to determine the increase in weight of children receiving high-protein high-energy biscuits compared to controls.

Results

Malnourished children enrolled in the SFP in January 2001 were followed up till July 2001. There was significant drop-out, particularly in the last 2 months (Table 1).

Throughout the study, we saw few children with weight ≥ 2 SD below standard weight-for-height or height ≥ 2 SD below standard for age. The wasting or stunting in those children, therefore, showed no significant changes. Since the SFP basically uses the weight-for-age index for the purposes of enrolling children, results of follow-up were constructed using weight-for-age criteria (Table 2 and Figure 1). Eighteen children had been introduced erroneously into the programme, i.e.

Table 1 Reduction in number of children attending the supplementary feeding programme at primary health care centres in Dohuk province, Iraq, 2001

Primary health care centre	January		April		May		July	
	No. children enrolled	No. children covered	No.	%	No. children covered	%	No. children covered	%
Bardarash	16	14	87.5		11	68.8	3	18.8
Seeri	21	20	95.2		19	90.5	10	47.6
Hojava	9	9	100		9	100	8	88.9
Mangesh	16	15	93.8		14	87.5	4	25.0
Razgary	13	13	100		10	76.9	2	15.4
Dairabon	13	13	100		9	69.2	1	7.7
Moqibla	7	7	100		5	71.4	6	85.7
Qasrok	43	43	93.0		35	81.4	23	53.5
Heizel	39	36	92.3		26	66.7	0	0.0
Total	177	167	94.4		138	78.0	57	32.2

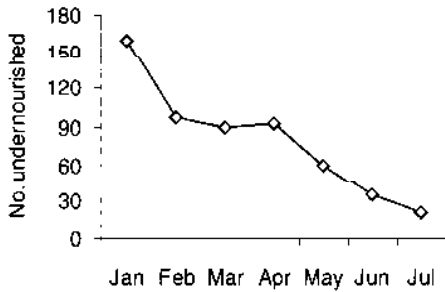


Figure 1 Number of underweight children more than 2 standard deviations below standard weight-for-age, January–July 2001 (numbers represent only children on the programme ≥ 2 standard deviations below normal weight-for-age at dates indicated, excluding drop-outs and the 18 initially normal children)

they initially had normal weight-for-age measurements, and therefore were excluded from the results in Table 2 and Figure 1.

The mean increase in weight for 25 children who received the biscuits for 1

month was 440 g, compared to 315 g increase in the controls, a mean difference of 125 g (95% CI: -18.6 to 269.5). The *t*-value was 1.772, therefore the difference was not statistically significant ($P > 0.05$). However, scrutiny of the data reveals that for 1 child enrolled in Sceri, weight decreased 200 g over the first month while he was receiving the high-protein high-energy biscuit. The follow-up data showed that he was having persistent diarrhoea. Exclusion of this child from analysis makes the difference statistically significant (mean difference in weight increase of 152.1 g, 95% CI: 16.4 to 287.8, *t*-value 2.241, $P < 0.05$).

Discussion

The household nutritional status survey of 1994 revealed a high prevalence of malnutrition in Northern Iraq, with 25.8% of children being underweight (≥ 2 SD below standard weight-for-age) [6]. Since 1994, there has been a general improvement in the nutritional situation [3]. The nutritional sta-

Table 2 Progress of 159 children enrolled in January 2001 on the supplementary feeding programme according to weight-for-age criteria

Month	Weight below normal for age (standard deviations)						Total no.
	<2.0		2.0–2.9		≥ 3.0		
	No.	%	No.	%	No.	%	
January	0	0.0	150	94.3	9	5.7	159
February	51	34.4	92	62.2	5	3.4	148
March	37	29.1	80	63.0	10	7.9	127
April	63	40.6	79	51.0	13	8.4	155
May	62	51.2	49	40.5	10	8.3	121
June	45	57.0	28	35.4	6	7.6	79
July	31	59.6	17	32.7	4	7.7	52

Eighteen children were excluded as they were initially normal weight but had been erroneously enrolled in the programme.

tus survey of November 1999 indicated prevalence of underweight of 9.5% [7]. The same trend of general improvement is shown by the nutrition surveillance data compiled by the directorates of health for growth monitoring units throughout Northern Iraq [8]. Distribution of rations by UNICEF and the directorates of health nutrition programme with the World Food Programme has contributed to improvements in the nutritional status of children [3]. However, the current evaluation reveals, more specifically, the difficulties experienced in improving the nutritional status of malnourished children through the existing SFP.

The most prominent feature of the present study is the significant drop-out, starting in May 2001, and becoming quite significant in June and July. From May onwards, the family ration was no longer given and families of enrolled children were only receiving the small child ration, the value of which is much lower than the expense of the trip from many villages to primary health care centres. Despite the existence of good general food rations, families had become dependent on this ration to justify their visit to the primary health care centre. Providing the special ration for a malnourished child and ignoring the family may decrease food availability within the family, and make the mother less capable of breast-feeding her child.

An important factor in causing drop-out from the SFP may have been the poor palatability and difficult preparation method of the soyabean mix, the main item of the child ration. These were repeatedly mentioned by parents during the course of the study. Some families used to feed the mix to poultry rather than their children.

Another factor which contributed to drop-out from the SFP, was the instruction given by World Food Programme and Di-

rectorate of Health mobile teams to the growth monitoring staff to weigh children and record monthly data only if the ration arrived. Due to the irregular arrival of the ration, such instructions resulted in an interruption of the monitoring process. Deficiencies and changes in the staff, coupled with overcrowding in some primary health care centres, e.g. Heizel and Seeri, also contributed to the drop-out. In Heizel, for instance, a trained female staff member took a long "motherhood leave" and was replaced by an untrained health worker. Growth monitoring of enrolled children and all other children was carried out not more than once or twice weekly. The result was that, despite supervision, such problems with the staff led to the erroneous enrolment of 18 children in the SFP. This is the reason for different totals in Tables 1 and 2.

Other factors that could have increased the drop-out rate include the hot weather of June and July, which may have discouraged families from travelling. These months also coincide with the harvest season, when rural families are too busy to bring their children to the growth monitoring units (Figure 1).

The current child ration (apart from the high-protein high-energy biscuit given in the first month) lacks adequate complementary food items like animal protein and micronutrients, in particular iron and vitamin A [9]. Iron deficiency anaemia and vitamin A deficiency are considered significant health problems in the region [10,11].

There was a relatively steep decline in the number of underweight children more than 2 SD below standard weight-for-age during the first month of the SFP (Table 2, Figure 1). This may be attributed to the effect of the high-protein high-energy biscuit. Apart from the first month, follow-up of malnourished children showed a gradual

and slow, rather than dramatic, improvement in nutritional status. This is obvious for the period from February to May (Table 2 and Figure 1). Afterwards, the attendance rate to the growth monitoring units was too low for a conclusion to be drawn. It may be concluded from the current study that the soyabean mix has less effect on weight gain than the biscuits, as the rate of decline in malnutrition was slower after the first month.

Further evidence for the effectiveness of the high-protein high-energy biscuit comes from the short follow-up study. After excluding 1 child who had persistent diarrhoea, children receiving the biscuits over 1 month displayed significantly higher weight gain than controls.

Lack of remarkable improvement, except for the first month of the SFP, could also reflect the emphasis by the growth monitoring staff on just giving the food ration. Other activities, in particular health education, seemed to be considered of less importance, taking into consideration the difficulties they encountered.

It is known that nutritional problems are multi-factorial with roots in many sectors of development such as health, education, demography, agriculture and rural development [2, 12]. Lack of a widely based intersectoral approach toward malnutrition may explain the slow trend of improvement.

Recommendations

Weighing of children enrolled in the programme and recording of data must be

done monthly, even if the ration arrives late. This will compensate for the incomplete registration of follow-up data and reduce the drop-out rate. Families should be educated on how to carry out the process. Since neither the growth monitoring staff nor the families used the small growth chart present on the immunization card, its importance should be emphasized for monitoring the growth of every child under 5.

Children enrolled in the SFP should preferably be given high-protein high-energy biscuits throughout the period of enrolment instead of the soyabean mix. It would then be possible to reduce the period of enrolment to 4 or 5 months because of the more rapid catch-up in growth.

Staff at primary health care centres, particularly growth monitoring staff, can be very useful in providing health and nutrition education to all caregivers provided they are well trained and retrained, supervised, supported and motivated.

A broad intersectoral and integrated approach involving all sectors of development is needed to tackle nutritional problems. Community participation programmes, using for example the Women's Union and traditional birth attendants, are needed to educate families on the use of growth charts and supplementary food items to tackle malnutrition.

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Training workshop to develop nutrition surveillance capabilities of Member States to improve the monitoring and evaluation capacities in nutrition programmes

The World Health Organization organized the above-mentioned training workshop at the High Institute of Public Health, Alexandria University, Alexandria, Egypt from 7 to 15 March 2004 in order to develop nutrition surveillance capabilities of Member States and improve the monitoring and evaluation capacities in nutrition programmes. The objective of the workshop was to prepare Member States to establish national nutrition surveillance systems with focus on micronutrient deficiencies. Participants from Bahrain, Islamic Republic of Iran, Jordan, Kuwait, Morocco, Oman attended this workshop as well as representatives from the Centers for Disease Control and Prevention, Atlanta and the United Nations Children's Fund.