Promotion of the Feeding Minds and Fighting Hunger initiative in selected rural schools in Andhra Pradesh, India

Mahtab S. Bamji and P. V. V. S. Murthy

Commentary

The following paper by Bamji and Murthy is, in keeping with the intention of the Food and Agriculture Organization (FAO) program developers, broadly applicable outside of rural India, and demonstrates a great deal of effort and enthusiasm by the authors, the teachers, and the schoolchildren. It is reasonable to ask, however, how relevant is the educational effort to the needs of poor people in less developed countries? The responses that the schoolchildren gave were sometimes surprisingly sophisticated: they clearly understood the role of poverty and demographic factors. Their knowledge of nutrition was quite general, the things they learned were pertinent, but in the end it seems unlikely that the nutritional state of people in the communities improved.

While this commentator is not familiar with the villages in the study, it is well known that in rural India, pregnant and lactating women, weanling children, adolescent girls, and the elderly are most at risk and often simple additions to the diet can make a great difference. Emphasis on the serious consequences of malnutrition—on birth weight, lactation performance, stunting in growth and development, and impaired immunity leading to higher mortality in young children—would have been helpful. Thus, one might wish that the effort had been more focused on specific target population groups, the impact of malnutrition in those groups, and specific ways to improve the nutritional situation of those in the most vulnerable groups.

The results show that the knowledge of the children in the program did improve, but how that new knowledge will translate into better nutrition in the community is not apparent. It is not unreasonable to assume that gradual improvements in the general knowledge of nutrition will eventually improve the nutritional status of the community, but this will surely be a slow process.

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Abstract

Background. *Schoolchildren are good agents of change and need to be educated and sensitized to specific issues of hunger and malnutrition through a question-and-answer process. Feeding Minds and Fighting Hunger (FMFH), a global project initiated by the Food and Agriculture Organization and partner organizations, attempts to help schoolchildren learn about these issues by introducing concepts in the prevention of hunger and malnutrition to teachers, and by facilitating transfer of knowledge to the children through a set of model lessons.*

Objective. *To test the feasibility of the FMFH approach to improve the nutrition knowledge of rural schoolchildren in three rural schools in Medak District of the South Indian state of Andhra Pradesh.*

Methods. *Participatory workshops for teachers were conducted to facilitate knowledge transfer to the children through interactive classroom teaching and other activities. The change in knowledge and thinking of children in the seventh and eighth grades was assessed by a ques-*

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*The editors of the *Bulletin* note with sadness that Dr. Wray died on March 9, 2006.

tionnaire administered before and after the intervention. The questionnaire also assessed, in part, the status of local food security based on the sources of different food items in the households.

Results. *The responses to the questionnaire suggested that the children's knowledge of nutrients and their functions was not good initially but improved after the intervention. However, their understanding of the social factors responsible for hunger and malnutrition was fairly good prior to the intervention. Improvement in responses to the question of what should be done to combat malnutrition also occurred after intervention. The community had village-level food security for rice and maize but depended partially or fully on outside sources for pulses, fruits and vegetables, and animal products.*

Conclusions. *The FMFH approach can be applied in rural schools where "the poorest of the poor" children can improve their understanding of balanced diets, better nutrition, the causes of malnutrition, and approaches to combat malnutrition.*

Key words: Classroom teaching, Feeding Minds and Fighting Hunger, food security, India, nutrition knowledge, rural schoolchildren

Introduction

Feeding Minds and Fighting Hunger (FMFH) is a global education initiative for schools designed to enable and encourage children and youths to become actively involved in helping to create a world free from hunger and malnutrition. Led by the Food and Agriculture Organization (FAO), other United Nations partners, and other regional and international organizations, it consists of materials and model lessons designed to enhance classroom teaching regarding key aspects of hunger, malnutrition, and food security.

To combat malnutrition in rural communities, the Dangoria Charitable Trust is striving to adopt the "three-A" approach of creating Awareness about food and nutrition in the community and improving Access to diverse foods at an Affordable price. Associated issues of sanitation and health-care outreach are also being addressed [1–3]. Schoolchildren are good agents of change, and our earlier experience has shown that they communicate what they have learned to their parents and demand change, hence the usefulness of this approach is likely. Children need to be educated and sensitized to specific issues through a process of questioning and seeking answers. Children in rural schools in India tend to be educationally deprived. Yet they are keen learners, and hunger and malnutrition are realities in their everyday life. Teachers in rural schools, even though they have the necessary qualifications to teach, are not adequately knowledgeable about the subject of food and nutrition, and they need some help in teaching and discussing these subjects in class. Hence the FMFH project was introduced in three government-run rural high schools in the Medak District of the South Indian state of Andhra Pradesh. Children in grades 7 and 8 (age 12–13) were the target group. The major objective of the project was to promote the organization of activities involving teachers and students in select rural schools by using the FMFH model lessons [4], and to examine the impact of this effort on children's knowledge and understanding of food and nutrition, factors responsible for hunger and malnutrition, and to make them think about possible remedial measures.

Methods

Three government schools, which serve the poorest of the poor families living below the poverty line, were selected: Zilla Parishad Girls' High School in Narsapur, Government Boys' High School in Narsapur, and Zilla Parishad High School in the village of Reddipalli, 7 km from Narsapur, the Mandal (administrative block) headquarters. Most of the children attending government schools are from families below the poverty line.

Ethical approval for the project was obtained from the trustees of the Dangoria Charitable Trust. After discussing the project with the school and district authorities and obtaining their approval, we selected two teachers from each school, one of whom was the science teacher. Unfortunately, the science teacher from the Zilla Parishad Girls' High School dropped out for personal reasons, so that only five teachers could participate. Except for one science teacher with a biology background who had some knowledge of food, nutrition, and health, the others were poorly informed on these subjects. Oral informed consent was obtained from the parents of the children for their participation in the project.

The project was launched during World Food Week in October 2003. On the day of the launch, morning assemblies were held in the schools in which the project was explained to the teachers and children, a nutritious groundnut-based sweet was distributed instead of the usual sugar sweet, a march through the village of Narsapur was conducted with displays of banners and placards on hunger and nutrition and the importance of World Food Day, and a formal inaugural function was held that included agriculture and nutrition scientists, local dignitaries, children, parents, and teachers. The organizers and dignitaries gave speeches and the children sang songs. Prizes were given to those children who had done well in the initial questionnaire on food and nutrition. The guest of honor was an eminent

agricultural scientist with a keen interest in nutrition. Three teachers' sensitization and training workshops were conducted with the use of a participatory, learner-centric approach. The FMFH model lessons were translated into the local language (Telugu) with culturally appropriate modifications. Classroom activities for the children included discussion of the daily diet to identify deficiencies, reasons and scope of improvement within the present financial constraints, a drawing competition, a "message of the day" written on the chalkboard and discussed, and planting of school vegetable gardens at two of the three schools.

A questionnaire on nutrition and food sources (see the Appendix) was administered to 15 to 22 children from each school initially and again at the end of the project. Children with superior academic performance and willingness to participate and with more than 80% attendance were identified by teachers to answer the questionnaire; project staff members explained the quiz to the children. An attempt was made to assess the children's knowledge of food and nutrition (e.g., nutrients, their functions, food groups, and nutritional deficiencies) with objective questions that could be scored. The grading scale was from 0 to 100.

The data were analyzed by Student's *t*-test to assess the significance of the difference between two sample means. In addition, open-ended questions were asked to assess knowledge and thinking on questions such as who is hungry, why are people hungry, what can be done to ameliorate hunger, who are some local heroes who have helped to fight malnutrition, and the like. In order to assess local food security, the children were asked where the households procured food items such as rice, wheat, maize, other millets, pulses, tubers, vegetables and fruits, milk, and eggs—from their own fields, the village market, a nearby village, or a weekly market in a nearby big village or town. The option of answering "Don't eat" for specific items was also given. The children were not asked about the frequency of consumption of different food items.

Toward the end of the project (February 2004), food and nutrition exhibitions were held in each of the three schools. The exhibits included charts, models, and live displays of local foods with their nutritional importance explained and balanced diets described. In addition to the exhibits prepared by the teachers and children (20 charts, two three-dimensional models showing distribution of hunger in the world, and live models) were charts from the Dangoria Charitable Trust. Charts were also obtained from the National Institute of Nutrition in Hyderabad, the State Food and Nutrition Board in Hyderabad, and a mobile exhibition prepared by the Hyderabad chapter of the Indian Women Scientists Association. Students were trained to explain the charts at the exhibitions. On request, teachers from the local ICDS (Integrated Child Development Scheme) centers, who are trained in nutrition, also helped. Wide publicity was given to the exhibition and parents and children from other schools were invited to visit the exhibition.

Results

Cooperation of the schools and district authorities

Initially the principals and the teachers were hesitant to start the project because they did not have the time and felt unprepared. However, after some explaining, they reluctantly came forward, and after the first workshop they became interested and enthusiastic. Fortunately, the local Mandal Development Officer was greatly interested and gave full cooperation. The District Collector was interested and readily gave permission for the project. The middle-level authorities were not uniformly cooperative but eventually supported the project.

The teachers found the project useful and interesting and, despite their initial hesitation, prepared good charts for the exhibition with the help of the children. They said that they had incorporated what they learned in their classes in different ways and that they wanted the project staff to visit as frequently as possible. Full cooperation was given to the project staff in classes, which were made interesting through a question-and-answer approach. The children enjoyed the project, because rural schoolchildren seldom get opportunities of this kind.

School gardens

Planting material for the gardens was provided and the gardens were set up. However, watering is a problem, particularly during summer vacations, and only one of the two gardens continues to be maintained.

Exhibitions

More than 1,700 children from various schools visited the exhibitions in the three schools on different days. Although the high level of attendance sometimes made it difficult to handle the crowds, the student volunteers were enthusiastic and explained the charts well. The "snake and ladder" games on the nutrition charts were very popular. The disappointing aspect was that very few parents came, even though they were invited. This lack of attendance was attributed to the fact that it was the active farming season, a time when most parents were busy in their fields during the day when the exhibitions were conducted.

Questionnaire for the children

Table 1 shows that children's knowledge regarding

TABLE 3. Responses to Question 9: What should be done to ensure that every one gets a balanced diet? (multiple responses)

Response	Initial (120)[a]	Final (114)[a]
	no. (%)	
Everyone should do agriculture	45 (43.3)	22 (21.8)
Work hard	27 (26.0)	15 (14.8)
Own land	7 (6.7)	1 (0.9)
Have a small family	6 (5.8)	4 (3.9)
Grow fruits and vegetables	6 (5.8)	7 (6.9)
Farmers should cultivate a variety of crops (diversification)	5 (4.8)	12 (11.9)
Increase production	4 (3.8)	10 (9.9)
Food should be available to all at low cost	4 (3.8)	12 (11.9)
Have employment	4 (3.8)	1 (0.9)
Help the poor	4 (3.8)	7 (6.9)
Everyone should be educated	3 (2.9)	1 (0.9)
Work together (cooperate)	3 (2.9)	3 (2.9)
Promote home gardening	2 (1.9)	5 (4.9)
Keep dairy cattle	1 (0.9)	1 (0.9)
There should be awareness regarding nutritious food	—	14 (13.8)
Ensure food security	—	19 (18.8)
Improve transportation	—	17 (16.8)
No response	16 (13.3)	13 (11.4)

a. Number of respondents, both classes combined.

TABLE 4. Responses to Question 12: What can affect food production in the country? (multiple responses)

Response	Initial (120)[a]	Final (114)[a]
	no. (%)	
Lack of water, fertilizers, manure, seeds, pesticides, and agricultural equipment	62 (70.4)	59 (59.6)
Damage from crop pests, birds, and cattle	13 (14.8)	6 (6.0)
Population explosion	12 (13.6)	15 (15.1)
Deforestation	8 (9.0)	2 (2.0)
Inadequate transportation	5 (5.7)	3 (3.0)
Political interference	5 (5.7)	2 (2.0)
Drought	4 (4.5)	2 (2.0)
Failure of bore wells	2 (2.3)	2 (2.0)
Mineral deficiency in soil	2 (2.3)	2 (2.0)
Single crop	2 (2.3)	1 (1.0)
Lack of money and loan facilities	1 (1.1)	1 (1.0)
Transport strikes	1 (1.1)	—
Poor technical knowledge about new methods of agriculture	1 (1.1)	18 (18.2)
Lack of irrigation facility	—	8 (8.0)
Environmental pollution	—	1 (1.0)
Seed or fertilizer adulteration	1 (1.1)	22 (22.2)
High price of farming material	—	5 (5.1)
Interference from middlemen	1 (1.1)	2 (2.0)
Illiteracy	1 (1.1)	8 (8.1)
No response	32 (26.6)	15 (13.1)

a. Number of respondents, both classes combined.

and Abdul Kalam (an eminent scientist who is also the current President of India). No musicians or artists were mentioned, although actor-politician N. T. Rama Rao was mentioned. In the final questionnaire, some children mentioned the name of Dr. Bamji (project consultant) also.

Source of food items for home consumption

The question "Where does your family get the following foods," with options such as own farm, same village, weekly market in nearby big village combination, and don't eat, was asked to get some idea of access to food within the village.

The responses (**table 5**) show that whereas village-level availability was good for cereals, millets, maize, sorghum, milk, and eggs, more than 50% of households had to depend on sources outside the village for pulses, fruits, and vegetables.

Discussion

For food and nutrition security, one has to have Awareness, Access, and Affordability regarding food and nutrition. Generation of awareness enables a poor community to make wise choices and demand the right types of food. Children are good agents of change, and our earlier experience has shown that they demand things from their parents and question them, and hence this FMFH approach is useful even for poor people in developing countries, despite resource constraints.

Our results show that the promotion of the FMFH initiative in the government-run rural schools where the poorest of the poor children are educated had positive impact on children's knowledge of nutrients and their functions (**table 1**) and to some extent on issues such as the what, who, and why of hunger and strategies for combating hunger, as assessed by a questionnaire administered at baseline and at the end of the initiative. The fact that students in the two schools in which the teachers attended the workshop and were motivated did better than those in the government girls' school, in which the science teacher dropped out and the other teacher could not devote much time to the project, stresses the importance of the teacher and the need to educate them. Although the children's knowledge of the science of food and nutrition was initially poor (**table 1**), their knowledge of the social aspects of malnutrition and hunger was quite mature. Hunger and malnutrition are realities that these chil

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TABLE 5. Responses to Question 13: Where does your family get the following foods?[a]

Food	Own field	Same village	Nearby village/ weekly market in nearby big village	Own village and other village	Do not eat
	no. (%)				
Rice	80 (66.6)	19 (15.8)	4 (3.3)	17 (14.2)	—
Wheat	43 (35.8)	46 (38.3)	15 (12.5)	9 (7.5)	7 (5.8)
Jowar (sorghum)	66 (55.0)	25 (20.8)	12 (10.0)	9 (7.5)	8 (6.6)
Ragi (finger millet)	28 (23.3)	24 (20.0)	32 (32.3)	4 (3.3)	32 (26.6)
Maize	84 (70.0)	18 (15.0)	12 (10.0)	—	6 (5.0)
Pulses	19 (15.8)	51 (42.5)	19 (15.8)	31 (25.8)	—
Potato	12 (10.0)	58 (68.3)	40 (33.3)	3 (2.5)	7 (5.8)
Onion	47 (39.1)	45 (37.5)	20 (16.6)	8 (6.6)	—
Green leafy vegetables	52 (43.3)	38 (31.6)	15 (12.5)	11 (9.1)	4 (3.3)
Other vegetables and fruits	13 (10.8)	43 (35.8)	59 (49.1)	5 (4.1)	—
Milk	40 (33.3)	43 (35.8)	28 (23.3)	—	9 (7.5)
Eggs	15 (12.5)	72 (60.0)	23 (19.1)	—	10 (8.3)
Meat or fish	3 (2.5)	34 (28.3)	51 (42.5)	—	32 (26.6)

a. Initial responses only.

dren live with. How to respond to the questionnaire was explained to the children with examples and it was administered in the local language, and therefore the children were able to understand the questions. The children who answered the questionnaire not only had better school attendance but also had a good record of scholastic performance, as shown by examination grades. Such non-random (purposive) selection can be regarded as a limitation of the present study for judging the impact of our intervention. However, even the other children showed keen interest and participated enthusiastically in the classroom activities and the exhibitions.

The children's responses to the question about the sources of different foods for their households suggest that all the families consumed rice, which they got from their own village and mostly from their own fields. Most families consumed wheat, maize, and sorghum (but not daily); most of the maize, and to lesser extent the sorghum, was grown in their own fields or purchased within the village. Wheat was sold in the ration shops in the villages through the public distribution system. However, food security (access) for foods such as pulses, vegetables and fruits, and some animal products appears to be less satisfactory, since they have to be procured from outside the village. Clearly there is a need to promote agricultural diversification by promoting production of legumes, horticulture and home gardening, and animal husbandry.

For promoting school gardens, a reliable supply of water and compound wall or proper fencing has to be ensured. Mechanisms for looking after the garden during the long summer vacation have to be developed, with the participation of the children residing in the particular village.

This experience of the Dangoria Charitable Trust in promoting the FMFH initiative points to the need to adapt and promote the FMFH tools as part of wider multisectoral initiatives for addressing the issues of hunger, food insecurity, and malnutrition. However, this has to be a long-term continuing process, rather than an isolated intervention. Strengthening the nutrition component in teachers' training would go a long way toward creating awareness of nutrition in the community through the children. Creation of awareness is the first step toward meeting the goal of nutrition security, because with awareness comes demand and better planning for food production to improve access to a variety of foods, even within the financial constraints. However, since change in the nutrition status of the community is a slow process, one cannot expect any change from a brief intervention.

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help. Statistical analysis of the children's responses to the questionnaire was performed by Dr. Vishnuvardhan Rao, statistician in the National Institute of Nutrition, Hyderabad.

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Appendix

Feeding Minds and Fighting Hunger (FAO Questionnaire)

Questions 1–5 have one wrong answer. Cancel the wrong answer.

1. To lead a healthy life we need
   1) a balanced diet.
   2) a clean environment.
   3) to watch the cinema.
   4) regular exercise.

2. If children don't eat well, they
   1) remain short and thin.
   2) fall sick frequently.
   3) feel like playing all the time.
   4) get tired easily.

3. A healthy, balanced diet should include
   1) rice.
   2) roti (cereal or millet salty pancake).
   3) dal (lentil).
   4) chocolates.
   5) vegetables.
   6) fruit.
   7) milk.
   8) egg/meat/fish.

4. If a pregnant woman does not eat a good diet, she
   1) gets anemia.
   2) gives birth to a low-birthweight child.
   3) does not gain proper weight during pregnancy.
   4) has good eyesight.

5. Nutrients present in food are
   1) proteins.
   2) blood.
   3) carbohydrates.
   4) vitamins.
   5) iron.
   6) calcium.

6. Match the food item with the nutrient it provides the most.

Food	Energy	Protein	Iron	Calcium	Vitamin A	Vitamin C
Rice						
Dal						
Papaya						
Guava						
Lemon						
Carrot						
Meat						
Amaranth						
Oil						

7. Match the nutrients present in the food (column 1) with their most important function.

Nutrient	Gives energy	Gives more energy	Body building	Protects against diseases
Carbohydrates				
Proteins				
Fat				
Vitamins				

8. Who suffers from hunger and malnutrition (name them)?

_____
_____
_____
_____
_____

9. What should be done to ensure that every one gets a balanced diet?

_____
_____
_____
_____
_____

10. Kamala and Ramu are sister and brother. They had the following foods yesterday: rice, tamarind water, and chili. Do you think they can remain healthy on this kind of diet? Tick the right answer.
    1) Yes.
    2) No.
    3) Don't know.

11. If "no" to the above, what else should they eat to remain healthy?

    1. 5.
    2. 6.
    3. 7.
    4. 8.

12. What can affect food production in the country?

13. Where does your family get the following foods?

Food	Own farm	Same village	Nearby village/ weekly market in nearby big village	Same village and other village	Do not eat
Rice					
Wheat					
Maize					
Jowar (sorghum)					
Ragi (finger millet)					
Dals (pulses)					
Potatoes					
Onions					
Green leafy vegetables					
Other vegetables					
Milk					
Eggs					

14. Do you consume milk or curd daily?
    1) Yes.
    2) No.

15. If no, why not?
    1) Don't like it.
    2) Don't get it (i.e., not available in my home).
    3) Too expensive.
    4) Any other (describe).

16. Name the two richest countries where there are very few hungry people.

17. Name the two poorest countries where there are many hungry people.

18. Name any three past or present great people in the country who have helped the poor people.

19. Would you also like to help people and be great some day?