

NUTRITION REVIEWS

VOL. 20

FEBRUARY 1962

No. 2

NUTRITION FUNCTIONS OF MATERNAL AND CHILD HEALTH PROGRAMS IN TECHNICALLY UNDERDEVELOPED AREAS

It is axiomatic that public health programs should be adapted to the needs of the people for whom they are intended and that where personnel and resources are limited, priorities must be established on the basis of a careful analysis of the relative seriousness of the problems faced and the particular segments of the population most affected by them. Despite general agreement on the correctness of this policy, health programs for underdeveloped areas are frequently organized in patterns designed for quite different populations and assigned priorities based on experience in more developed areas. Although the professional people responsible may be aware of this defect in their programs, they often do not know the direction in which changes should be made when they are employed in an area or culture different from that in which they have been trained.

Since circumstances differ from region to region and country to country, no general analysis of the special needs of technically underdeveloped regions can be taken to apply to all areas. Nevertheless, certain general principles should be borne in mind by anyone trained in the United States or Europe who is assigned to work in a technically underdeveloped area, particularly in the tropics or subtropics. These principles are widely applicable to rural and poor urban populations in which there has been relatively little recent cultural or economic change, even though they do not pertain to the business and professional groups in these areas. For the latter groups, living patterns are in most respects closely similar to those in more developed countries. In rapidly developing countries, particularly in urban situations, any stage of transition may be encountered. This paper attempts to out-

line those principles which apply to the nutrition functions of maternal and child health programs of most technically underdeveloped areas.

In most such areas breast-feeding of the infant is the rule; the failure of the mother to breast-feed her child during the first six to nine months is the exception. Moreover, in some areas breast-feeding may be prolonged well into the second and occasionally into the third year. The classical form of severe protein malnutrition in children receives its name kwashiorkor from the native African Ga dialect words meaning "first" and "second" which were applied to describe the disease as one which develops in the first child when he is displaced at the breast by the second (H. C. Trowell, J. N. P. Davis, and R. F. A. Dean, *Kwashiorkor*. Edward Arnold Ltd., London, 1954). The development of serious malnutrition as a result of defective feeding of the weaned infant is a common problem in almost every underdeveloped country and territory in the world.

As long as breast-feeding goes well, nutritional problems in the child are minimal. However, toward the end of the first year, when supplementary feeding begins to be important, such food as may be given in addition to mother's milk is likely to be grossly inadequate. The real nutritional crisis, however, comes with weaning and it is during the second year of the child's life that nutritional supervision and advice to the mother regarding the child's diet become most important. Yet close supervision of the child under one year must not be abandoned since any failure of the mother to supply at least moderate amounts of breast milk is likely to be disastrous for the child. Too often the substitute is rice water, sugar

water or very diluted milk, and the result is marasmus (D. R. Jelliffe, *Infant Nutrition in Subtropics and Tropics. World Health Organization, Monograph Series No. 29, 1955*).

At the most critical time for mother and child, the period of lactation, it is unlikely, at present, that health supervision and nutritional advice will be given. Since programs for the mother in the United States concern themselves primarily with prenatal care and a single postpartum visit, there has been a tendency for programs in underdeveloped areas to be similarly oriented, despite the fact that the over-all nutritional stress of pregnancy is much less than that of prolonged lactation (*Protein Requirements. Food and Agriculture Organization, 1957*). Furthermore, an inadequate diet during lactation not only affects the mother adversely but may also have serious consequences for her infant due to decreased lactation. It may also result in critical nutritional deficiencies in the mother at the time of a subsequent conception and during the early weeks of the next pregnancy when organogenesis is occurring. These deficiencies in turn may cause congenital abnormalities and miscarriages.

Still another important but often unrecognized factor is the close relationship in underdeveloped areas between malnutrition and a high mortality among infants and young children due to infections. Much of the excessive mortality in these circumstances is the result of infections which would not represent a serious threat to the life of the well-nourished child. The high death rates reported from diarrheal disease, pertussis, and measles are examples. Since sanitary conditions are usually such that the child is exposed not only to the usual childhood diseases but must also develop resistance to a variety of strains of enteric bacteria and viruses, this secondary effect of malnutrition becomes especially important. It justifies a concern for nutrition which would be excessive for a maternal and child

health program in the United States or Europe.

Because infection so often precipitates fatal malnutrition of the kwashiorkor type in preschool children who are already basically undernourished, the potentially serious consequences of even mild diarrhea or systemic infections also need to be understood and special attention paid to preventing the development of kwashiorkor following infection. Unfortunately, the therapy most likely to be given by the mother to her sick child is the discontinuance of solid food and any products of animal origin. In their place she administers thin cereal gruels and perhaps also a strong purgative. This kind of misguided therapeutic effort of the mother is often the determining factor in the death of a child whom clinic personnel, on the basis of the apparently minor nature of the illness, would expect to survive.

On the other hand, direct instruction given to the mother for the improvement of the feeding of her child may be singularly ineffective for a variety of reasons. The suggestion that milk and other sources of animal protein be given to the child with diarrhea may run counter to deeply ingrained concepts as to the causation of the disorder and how it should be treated. It may also be quite beyond the capacity of the mother to purchase and prepare relatively costly foods, especially if they are ones with which she is not familiar. Maternal and child health personnel charged with nutritional guidance should not give stereotyped instructions without making certain that the mother understands them and is able and willing to follow them. In some circumstances, the advice, if it is to be of any practical value, may have to include the use of combinations of local foods of vegetable origin to provide needed protein; this practice requires knowledge of local food resources and customs not often included in the formal training of the workers involved.

The direct distribution of food to needy infants or to mothers for administration to

their young children is often much more difficult to accomplish than might be expected. If a mother is to bring her child to a center to receive food, she must be convinced that it is important and she must have sufficient free time to do so regularly. In practice the many other demands upon her time are likely to result in the failure of this method no matter how assiduous the social workers designated to support the program.

Allowing the mother to take with her one or two weeks supply of food such as dried powdered skim milk may also be of uncertain specific value to the child. There is a strong tendency for the mother to divide such food among the members of the family so that the child for whom it is intended may receive too little for practical nutritional benefit. In general, supplementary feeding programs should be evaluated periodically, using the type of procedure suggested in the report of the second meeting of the WHO Expert Committee of Maternal and Child Health (*Administration of Maternal and Child Health Services. World Health Organization Technical Report Series No. 115, 1957*).

Efforts to find the most effective ways of carrying out the nutrition education and supplementary feeding functions of a maternal and child health program in underdeveloped areas have led to the conclusion that one of the best ways is through the nutritional rehabilitation demonstration center, maintained as part of the routine activities of a health center. Mothers whose weaned infants are found to be on the verge of serious malnutrition are asked to bring them to the center to receive two or three complete meals each day until they have been restored to satisfactory nutritional status. The mothers have an opportunity to see what proper feeding alone can accomplish and a great effort is made to show them the diet given and how it can be prepared.

Equally important, women seen for prenatal care are requested to assist several

times, at intervals of two to four weeks, in the purchase, preparation, and administration of the food under the supervision of a public health nurse who in turn receives instruction and periodic supervision from a nutritionist responsible for a number of such centers. The mothers thus learn by first hand experience to prepare and give the child foods which they would not use without this demonstration. They also see both the consequences of poor nutrition and the benefits of proper feeding practices. Each public health nurse who participates becomes more conscious of nutrition problems and is more effective in helping mothers to solve them when she returns to her regular task.

As already indicated, the schedule of visits by the mother and child to the clinic should be determined in most underdeveloped areas by factors which are quite different from those in the United States. In general, as much or more attention needs to be given to the supervision of the nutrition of the child in its second year as in its first year of life, and it is even more desirable than in the United States that the child receive regular health supervision during the entire preschool period. These statements are supported by the infant mortality rates, which are two to five times higher in underdeveloped countries than in the United States and Western Europe, and by those for children from one to four years of age which are from ten to over 40 times higher (L. J. Verhoestraete and R. R. Puffer, *Courrier* 7, 185 (1957)).

Nutrition education is important in all areas, but where the majority of mothers are at least functionally illiterate, great confidence in printed pamphlets and leaflets is misplaced. Even posters and other visual aids are relatively ineffective and may even create quite erroneous impressions. Personal contact with the physician and public health nurse and participation in demonstrations in the home or health center are likely to be the most effective ways of educating mothers in underdeveloped areas.

The persons responsible for these personal contacts should be well informed of the beliefs and habits of the people they serve. In maternal and child health programs in Western countries the professional workers and the persons for whom they are responsible tend to have the same general concepts of the role of food and the causation of disease, but in underdeveloped areas the differences can be very great and yet often pass largely unrecognized. Closely related is the need to realize that all people have their own systems of beliefs and rationalizations about their problems and are not waiting in a vacuum for information. New concepts, unless convincingly presented, will not readily displace inherent beliefs or gain quick acceptance.

Consultants, administrators, and profes-

sional personnel responsible for the nutrition functions of maternal and child health programs in underdeveloped areas must know something of local food habits and prejudices, local food resources and economic factors affecting their use, the interaction of malnutrition and infections and infestations, and the relative importance of nutrition as compared with other pressing health and welfare problems. Only in this way will serious errors be avoided and maximum effectiveness of efforts to improve the health of mothers and children be achieved.

NEVIN S. SCRIMSHAW, PH.D., M.D., M.P.H.
*Department of Nutrition, Food Science and
Technology
Massachusetts Institute of Technology
Cambridge, Massachusetts*