

Malnutrition among children endures in much of the developing world despite numerous efforts to improve the nutritional status of mothers and children. In reviewing data from 1980 to 1992, the World Health Organization found that more than one-third of children less than five years old in developing countries have height-for-age scores more than two standard deviations below the median of reference populations (Brown, Dewey, and Allen, 1998). The proportion of children with poor nutritional status has changed little or not at all in the past 20 years.

Public health and medical specialists understand fairly well the debilitating effects of malnutrition on young children: stunted growth, impaired cognitive functioning, increased vulnerability to disease, and greater risk of death (Nicoll, 2000; Pollitt, 2000). Research has found malnutrition to be one of the five most common causes of death among children less than five years old in developing countries, along with malaria, measles, diarrhea, and acute respiratory infections (Gernaat, Dechering, and Voorhoeve, 1998; Vardas, Blaauw, and McAnerney, 1999).

2.1 INTERNATIONAL RECOMMENDATIONS ON BREASTFEEDING AND COMPLEMENTARY FEEDING

International consensus indicates that complementing breast milk (*even with water*) during the first six months of a child's life is unnecessary and may even increase the risk of diarrhea as extra solids and liquids are often contaminated (Almroth and Bidinger, 1990; Popkin et al., 1990; Martines, Rea, and DeZoysa, 1992). In addition, children who receive liquid or solid foods in the very early months may spend less time breastfeeding and suckle less intensively so that the mothers' breasts are less stimulated to produce milk. Earlier complementary feeding has been associated with an earlier age at weaning in many cultural settings (Martines, Rea, and DeZoysa, 1992). Thus, guidelines drawn up by pediatricians recommend exclusive breastfeeding for the first four to six months of the child's life. After that, it is recommended that low-cost, locally available weaning foods gradually be introduced (Koniz-Booher et al., 1991).

The recommendations do not usually consider liquids regularly given as medicines or for ritual purposes as complementary food. If such liquids are not "food," then the definition of complementary feeding is ambiguous. Giving traditional medicines (often with butter from cows' milk or from the shea nut) daily was virtually universal and often constituted the only substance consumed in addition to breast milk among some children over six months of age. Thus, for the purposes of this report, we have included traditional medicines as supplements because they probably comprise a source of energy, albeit limited, for the children concerned.

2.2 INTERNATIONAL RECOMMENDATIONS ON DIARRHEAL DISEASE MANAGEMENT

The Health and Communications Division of the World Health Organization (WHO) provides the following advice for mothers of sick children who are nursing:

- Breastfeed more often.
- If your child has started eating other foods, offer food more often, in small amounts, and give plenty to drink.

It will be shown below that mothers' management of diarrheal disease was generally appropriate in terms of continuing breastfeeding and increasing the giving of water. However, children were rarely encouraged to eat when ill, nor given extra food.

2.3 MEASURING MALNUTRITION

The three indicators used to assess nutritional status are height-for-age (stunting), weight-for-height (wasting), and weight-for-age (underweight). Children are considered malnourished if they are more than two standard deviations below the median of the U.S. National Center for Health Statistics (NCHS) reference population by one of these criteria. Stunting results from inadequate food intake over a long period and/or repeated episodes of illness. Wasting reflects recent shortage of food and/or current acute illness.

Being underweight is a composite indicator that may reflect either chronic or acute low food consumption, or both. It is often used as a general indicator of health status. Children with Z-scores between two and three standard deviations below the median are considered moderately malnourished, while those below three standard deviations are severely malnourished (Haggerty et al., 1998).

Evidence of the range and degree of malnutrition among young children in most Saharan Africa can be derived from the Demographic and Health Surveys conducted in 23 countries from 1992 through 1998. In these countries, the percentage of children less than three years old who were malnourished by being underweight varied between a low of 16 percent in Zimbabwe to a high of 50 percent in Niger, with most countries falling between 22 and 35 percent. About one-fourth or more of these children were severely underweight.

In these surveys, the percentage of stunted children varied from 20 percent in Ghana to 48 percent in Madagascar, with the majority of countries situated between 22 percent and 38 percent. In 12 of the 23 countries, one-third or more of the children less than three years old were stunted. The proportion of children who are stunted increases dramatically for children age 10-21 months, often from less than 10 percent to as high as 40 percent. For West African countries, the prevalence of stunting begins increasing from 10 to 15 percent at about six months of age and peaks at over 50 percent at 21 months. Since height-for-age assessments reflect chronic rather than acute malnutrition, we consider stunting to be a more revealing measure of nutritional status than wasting or being underweight.

2.4 CAUSES OF MALNUTRITION

The causes of malnutrition are multiple and include poor socioeconomic conditions, inadequate prenatal care, maternal malnutrition, short spacing between births, high fertility, large numbers of young children, ignorance about feeding, repeated infections, and lack of access to health services. Malnutrition has been noted as an underlying cause of 40 to 50 percent of all under-five deaths in West Africa, with the likelihood of mortality doubling with each lower category of nutritional status (Ghosh, 1990). It has been estimated that more than 80 percent of deaths associated with malnutrition involved mild or moderate malnutrition (Pelletier, Frongillo, and Habicht, 1993). Thus, understanding the causes and context of malnutrition will lead to improved child survival and better child health outcomes.

UNICEF (1999) distinguishes between basic causes of malnutrition related to the resources available at the level of society, the underlying causes at the household level, and the immediate causes, which are inadequate food consumption and infectious disease. Food intake may be inadequate in quantity or quality, while illness reduces appetite and the ability to absorb nutrients. Causes of malnutrition at the household level include low level of access to food, inadequate child care practices, and poor water and sanitation.

Risk factors related to the health of the mother and child found to be associated with the nutritional status of the child include the low birth weight of the child, the incidence of illness in the child, and malnutrition in the mother. In a case-control study of malnutrition among young children in Accra, Ghana, Rikimaru et al. (1998) found that low birth weight was an important risk factor for the prevalence of underweight and severe malnutrition (stunting) and that lack of education in the mother was also a risk factor.

Increased maternal education has often been reported to have a positive association with the nutritional status of young children. Scholars have debated whether the association indicates a causal relationship or whether education is really a marker for unmeasured variables. Some studies have found evidence that the effect of maternal education on nutritional status differs according to the level of household income. Doan (1988) found that in Jordan, maternal education is associated with better nutritional status in households of average resources but not in those with high and low levels of income.

Another of Doan's findings relevant to this study relates to a mother's social status. Doan concluded that a mother's low social power in her household and, in particular, her coresidence with her mother-in-law, had a negative association with children's nutritional status even when controlling for education. Reed, Habicht, and Niameogo (1996) found that in Benin, maternal education was associated with better nutrition only in the middle income households, had no effect in the poorer ones, and was associated with poorer nutrition in the richer households. This last finding was thought to be related to the fact that women with higher education tend to work outside the home and make more use of surrogate caregivers. Ruel and colleagues (1992) found that in Lesotho, the importance of the effect of education varied with socioeconomic status.

The analysis of factors associated with nutritional status provides information about the overall picture without demonstrating causal relationships. Because of what is known about growth and biological phenomena, the effects of low birth weight and of illness on nutritional status seem evident. However, little is known about what other factors play a role in determining the nutritional status of a young child. Does the mother's social network play a role? What about the behavior or actions of the child? How might we characterize the interaction between mother and child, and how critical is this interaction? Researchers who use the concept of "failure to thrive" have stated that malnutrition should be viewed as the result of problematic interaction between mother and child rather than a problem in the child or in the environment (Wright and Birks, 2000).

Answers to such questions are not likely to come from large sample surveys, but rather from smaller-scale studies that include extensive observations and the collection of data about the interaction between a child and a caretaker. Yet studies that examine how young children are actually fed at home or the social interactions that determine what a child eats are relatively rare. An exception is a study conducted in rural Tchad that examined the relationship between stunting (height-for-age) and psychosocial characteristics of caregivers. Although maternal height and caregiver workload were not significant predictors of stunting, caregiver autonomy and satisfaction with life, as well as family social support, influenced child height-for-age independently of household socioeconomic factors (Bégin, Frongillo, and Delisle, 1998).

