A Theoretical Framework for Studying School Nutrition Education Programs

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ABSTRACT This paper suggests a framework for studying school nutrition education programs, facilitating comparative studies, and expanding our knowledge of nutrition education. The model could be used to study potential influences on children's current nutrition knowledge, attitudes, and behavior and includes 3 relevant environments—home and family, school, and community. An understanding of these influences and their relative importance could serve as a basis for designating program objectives, identifying intervention targets, and determining potentially effective strategies. The model also focuses on the change process as influenced by nutrition education programs. This model considers the process and intermediate goals of the program as well as the outcomes and is a suggested beginning for research to build toward a general understanding of the process of nutrition education.

In the past few years there has been an increasing interest in nutrition education in the schools. The federal Nutrition Education and Training Program has added impetus to this interest and opened new possibilities for nutrition education programs for school-age children. In order to improve the effectiveness of these education programs, it is important that we systematically identify and study factors that influence their impact. This paper proposes a common theoretical framework that would facilitate comparisons among studies and thus build a better understanding about why children eat what they do and how we can influence their behavior.

The model presented in Figure 1 identifies factors that affect a child's nutrition knowledge and beliefs, attitudes, and practices and provides a framework for illuminating the factors that facilitate or block the success of nutrition education in the schools. The proposed framework suggests a broader approach to studying nutrition education programs than the program-evaluation approach that has characterized much nutrition education research to date. Although evaluation of outcomes is an essential component of this broader perspective, it contributes little, by itself, to knowledge about the process of nutrition education. The approach suggested in this framework puts program evaluation data and information about the process into a theoretical context so that results can be generalized to other nutrition education programs. This framework also serves as a basis for planning nutrition education programs which take into account this array of influences and therefore increase the chances of successful intervention.

GENERAL APPROACH

A child's food practices and the potential for change are influenced only in part by individual attitudes, knowledge, and food preferences. Environment, including the quality and aesthetic appeal of the food available and the attitudes and practices of "significant others," has perhaps an even greater impact. The importance of the total social context in which change occurs has been shown in the social change literature. This model suggests that the potential influences on a child's current nutritional behavior are within the child's environment as well as part of the child's own dispositions—which themselves are influenced by this environment. An understanding of these influences and their relative importance serves as a basis for designating program objectives, identifying intervention targets, and determining potentially effective strategies.

The model also focuses on the change process of nutrition education programs. It suggests a macro-approach in which the overall process and relevant subsystems are considered. It is based on the view that there are many influences in the environment that affect not only initial nutritional practices but any purposeful attempts to alter them.

Although specific goals and programs vary according to the particular setting, with this common framework, studies of any program can build toward a comprehensive understanding of factors that facilitate or block change.

Figure 1 illustrates the hypothesized influences on a child's nutrition knowledge, attitudes, and practices. Two environments that have been identified as having a primary or direct effect on a child's food behavior are the home and family and the school. The community environment, which includes influences within the immediate community, such as the availability of fast food restaurants and the economic conditions as well as broader influences such as television, would have its greatest influence indirectly through these 2 environments. The child's own dispositions based on experiences, attitudes, and values, all of which influence knowledge, attitudes, and practices related to nutrition, are in turn influenced by these 3 environments.

The relationship among nutrition knowledge, attitudes, and practices is of considerable importance to intervention programs. Some people believe, and many still operate as if it is true, that changes in knowledge, attitudes, and behavior (common terms for the 3 components of attitudes—cognitive, affective, and behavioral [1]) occur in the aforementioned sequence. However, there is considerable evidence to the contrary (2). It is probably not always necessary to change one's attitude before changing one's behavior. Certainly, changing attitudes does not necessarily lead to changes in behavior. If a person can be influenced to change her or his behavior and act in the desired manner, he or she may then change her or his attitude to make it consistent with the action already taken.

Consistency theory (3) suggests that a change in one of these 3 elements creates a strain toward change in the others. Hence, if people are induced to change their behavior, they are more likely to change attitudes to be consistent with the behavior. Knowledge
and beliefs, attitudes, and behavior would then be related in an interactive manner, as illustrated in Figure 1. Each child has a set of dispositions—social and psychological factors and personal characteristics such as age and sex—which affect nutrition attitudes and practices. Dispositions include personal characteristics such as age and sex, which have been shown to influence nutrition attitudes and behavior (Note 1). The child's previous experiences and skills will influence her or his general orientation to the environment and also will influence nutritional practices.

**Home and family environment.** The model proposes that the primary influences within the home and family environment are parents, siblings, and the eating situation. Important factors are the parents' nutrition knowledge and beliefs, attitudes toward nutrition, and food preferences; the dynamics of the eating situation, including foods available in the home; and food preferences of siblings. Although some of these relationships have been studied, they need to be considered in a total context and in relation to the school environment. The mother's nutrition knowledge affects the adequacy of her child's diet (4, 5, 8). The influence of the father's knowledge has not been well studied, although Yetley (Note 2) found that the father's nutrition knowledge was related to the adequacy of his wife's diet, so that the hypothesis linking the father's knowledge to the child's diet is plausible. There is evidence of a relationship between a mother's attitudes and her child's nutrient intake (4, 5). Data on the relationship between the food preferences of fathers and mothers and those of their children are conflicting (7, 8, 9), but there is some evidence of similarity among siblings' food preferences (4, 7). Whether siblings influence each other or whether the similarity simply results from exposure to the same family environment is not clear.

There is considerable evidence relating other family characteristics to the diet quality of young children (5). Some studies have found a positive relationship between family income and a child's nutrient intake (5, 11), but others have not (4, 12, 13). Eppright et al. found a positive relationship between the amount of money the family spent on food and a child's nutrient intake (4); Sims and Morris found no significant relationship (12). There is some evidence that a child's nutrient intake is less adequate in larger families (5, 13, 14).

**School environment.** According to the model, important subsystems in the school environment are teachers, administrators, foodservice personnel, and peers. Teachers would have a direct effect on the child's nutrition experiences in the classroom and an indirect effect through the school and lunchroom atmosphere. Data from one study (15) clearly showed that nutrition education in the classroom is more successful when teachers and administrators are committed to nutrition. In a study of nutrition education units for fourth and fifth grades, Baker (16) observed that children in the class in which the teacher made unsolicited negative remarks about squash rated squash lower than did other classes where the teachers made no such comments.

School administrators and foodservice personnel control the lunchroom procedures and atmosphere. Food served, logistics of the food service, and personal and social aspects of lunchtime are important factors in the success of school lunch programs (17). Children's participation in the school lunch has been shown to have a significant influence on their nutrient intakes (14). Head (15) found more success with nutrition education in schools where the school foodservice supervisor was committed to the importance of nutrition education.

There is considerable evidence that opinions of and interactions with peers are important influences on children in general,
although there is limited data on food behavior in the school environment in particular. Alischul (17) suggested that peer pressure affects plate waste. Yerman and Vermeersch (18) found a relationship between a child's menu choice and perception of a best friend's choice, but the data did not suggest any causative relationship. Baker (16) found that when a child in one class made enthusiastic remarks about squash in a taste test, the class rated squash higher than other classes.

Community environment. Community characteristics such as urbanization and general economics status may affect children's eating practices through the availability of certain foods, access to fast food restaurants, and community norms. The community also includes the larger environmental factors, such as television food advertising.

FACTORS AFFECTING PROGRAM IMPLEMENTATION AND SUCCESS

The same subsystems that enter into children's current practices, i.e., parents, teachers, administrators, foodservice personnel, and other children, also can influence programs designed to change these practices. The model in Figure 1 also illustrates these influences within the process of nutrition education along with the outcomes of nutrition education programs. The model is an eclectic one which draws upon sociology, communications, and educational evaluation. Although not a standard evaluation model, its major components of input, intervening process, and output are consistent with more general evaluation models (see e.g., 19). Hopefully, this paper will stimulate research to test these relationships within the context of nutrition education.

The program input in the model refers to a nutrition education program for a particular school. It is the "ideal plan": a special project in the school cafeteria, program resource materials developed for the fifth grade, or any one of many specific activities. However, an intervening process must happen between the choice of the program and achievement of the outcomes. This process is the program implementation. For example, if the input is a set of resource materials for use in the classroom, the children must be exposed to the materials, read or view them, and comprehend them as intended. Program implementation can be conceptualized in terms of such intermediate goals, or objectives.

The model also proposes that interaction among the children and between the children and the other subsystems is important to a nutrition education program. The predispositions of the individuals in each of these subsystems would have a direct influence on the intervening process of program implementation and an indirect influence on the outcomes of a school nutrition education program. The school system itself also would influence the nutrition program input and the implementation. In some cases changes in the knowledge and beliefs, attitudes, and behavior of the relevant subsystems will be important factors in the program implementation.

The following example of a program plan for children to taste a variety of vegetables in the school cafeteria illustrates possible influences of these subsystems. The specified vegetables must be served, which requires cooperation of the foodservice personnel. The principal may influence the foodservice personnel's willingness to prepare them. Then each child must be willing to try them. The teacher's attitude and example may affect whether the child is willing. Similarly, parents may have affected a child's willingness to try an unfamiliar food, and the family's food practices will certainly affect familiarity of the vegetables to a child. Peer response also influences a child's willingness. In addition, the general atmosphere, such as the noise level in the cafeteria, the time allotted for lunch, and the quality and method of preparation of the vegetable may influence the process. This model provides a framework for organizing these various influences and delineating the weaknesses in the system which must be overcome for successful intervention.

This theoretical framework for studying nutrition education programs in the schools is a dynamic model which may be altered and expanded through research. If we are to develop a more complete understanding of the multifaceted field of nutrition education, we must go beyond evaluating program-specific goals and study the factors in a theoretical context. Unless we move in this direction, the current opportunity for improved planning and implementation of nutrition education programs in the schools will be lost.

NOTES


LITERATURE CITED


