Education Brief

NUTRITION PAPER OF THE MONTH
December, 1996

The Effectiveness of Nutrition Education and Implications for Nutrition Education Policy, Programs and Research: A Review of Research

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J. Nutr. Educ. (Special Issue) 27 (6):277-418, 1996. (Executive Summary, pp 279-283).

Does nutrition education work? If so, what are the successful elements across interventions? What are the implications of the findings for nutrition education program implementation, research, and policy? These are the questions that this review wanted to answer. While based on interventions in the US (217 were reviewed that had strong evaluation designs), and it examined only the effectiveness of the strategies used to deliver nutrition education, not what the nutrition science content of the interventions should be, many of the conclusions do have broad implications for nutrition education around the world. Nutrition education was defined as "any set of learning experiences designed to facilitate the voluntary adoption of eating and other nutrition-related behaviors conducive to health and well-being". The major finding is that nutrition education "works" in that it is a significant factor in improving dietary practices when behavioral change is set as the goal and the educational strategies employed are designed with that as a purpose. In effective programs, the behaviors addressed are identified from the needs, perceptions, motivations, and desires of the target audience, as well as from national nutrition and health goals and science-based research findings; the programs use a combination of contemporary models of individual, social and environmental changes. Many of the lessons learned may be relevant not only to the improvement of dietary behaviors, but also of all caring practices that influence nutrition.

Only the Executive Summary is included here; however a copy of the entire special issue can be obtained for $25.00 US from Journal of Nutrition Education, c/o Decker Periodicals, 4 Hughson Street South, 4th Floor, Hamilton, Ontario, Canada L8N 3Z1.

UNICEF New York
Nutrition Section
December 1996

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Executive Summary

INTRODUCTION

This review of nutrition education research and interventions in the U.S. has been conducted to provide insight into the effectiveness of nutrition education for the public. More specifically, this paper addresses two key questions:

1. Does nutrition education work? If so, what are the successful elements across interventions?
2. What are the implications of the findings for nutrition education program implementation, research, and policy?

This monograph documents the effectiveness of nutrition education from studies conducted since 1980 in each of the following population groups within the U.S. population: preschoolers, school-aged children, adults, pregnant women and caregivers of infants, and older adults, as well as on the inservice preparation in nutrition education for paraprofessionals and professionals. It examines only the effectiveness of the strategies used to deliver nutrition education, not what the nutrition science content of the interventions should be.

This monograph includes only intervention studies with strong evaluation designs that analyze the effectiveness of nutrition education. The studies usually involve random assignment of subjects to treatment groups or strong quasi-experimental designs and some evidence of instrument reliability and validity. Other studies that had some limitations were also included if they illustrated promising approaches and their authors noted limitations. This review is particularly timely since it has been about a decade since comprehensive reviews of nutrition education were carried out.

DEFINITION OF NUTRITION EDUCATION AND CRITERIA OF EFFECTIVENESS

There are many definitions of nutrition education. For the purposes of this monograph, nutrition education is defined as any set of learning experiences designed to facilitate the voluntary adoption of eating and other nutrition-related behaviors conducive to health and well-being.

This definition and others suggest that behavioral change is the ultimate criterion for effective nutrition education. The term "behavior" does not necessarily refer to nutrient intake as measured by dietary recalls, records, or food frequency questionnaires. It can refer to more proximal effects of nutrition education, such as intakes of specific foods, some composite index of food intake or food score, or actual behaviors, such as eating five fruits and vegetables per day, having fruits available and visible at home, salting foods, taking skin off chicken, having one's serum cholesterol checked, or even, in the ecological domain, reusing grocery bags.

It is also important to obtain information on the impact of nutrition education on a variety of potential mediating and enabling factors that might contribute to the achievement of behavioral change goals. Such information will help us to identify those elements that make nutrition education effective. Factors contributing to effectiveness might include personal factors, such as behavioral intent, behavioral expectancies, health values, and sense of personal empowerment or self-efficacy; behavioral capabilities or relevant knowledge and cognitive, affective (or emotion coping), and behavioral skills; and environmental supports. Consequently, studies included in this review are those that attempted to bring about demonstrated improvements in one or more of the following: knowledge, attitudes and other mediating variables, skills, behaviors, and health outcomes.

REVIEW OF STUDIES

This monograph review results from 217 nutrition education intervention studies. In the preschool category, 23 studies examined the impacts of nutrition education on knowledge, attitudes, and behavior; the effects of behavioral interventions; and the role of parents. In the category of school-aged children, 43 studies fell into two groups: those addressing general food and nutrition issues and those that focused specifically on producing behavioral change. The former examined effects on knowledge, attitudes, and behavior and the latter examined the impacts on behavior, as well as several potential mediating variables, such as self-efficacy, behavioral skills, and behavioral intent. In the adult category, 80 studies examined national mass media campaigns, large-scale community projects, the Expanded Food and Nutrition Education Program (EFNEP) with low-income families, and interventions at worksites and points of purchase. The impacts of individual counseling and group classes for nutrition education during pregnancy were examined in 18 studies in the U.S. Breastfeeding education was examined in 16 studies in the U.S. Interventions involved prenatal counseling and classes, in-hospital bedside counseling, and follow-up support, often using peer counselors. Older adults were the subjects of 16 studies. These studies examined the impacts of nutrition education through classes, print media, screening, and innovative approaches. The inservice training in nutrition education of professionals and paraprofessionals was examined in 21 studies. This category included the training provided to teachers, school foodservice personnel, nutrition paraprofessionals, such as EFNEP aides, and other health professionals, such as physicians. The conclusions described below are, therefore, based on sound empiricism.

context, modeling by peers and adults, and appropriate use of rewards. For older children and adults, behavioral strategies included self-assessment; learning effective behaviors for healthful eating; clarifying expectations and values; choosing among alternatives; personal goal setting; learning the cognitive, affective, and behavioral skills needed to achieve goals; monitoring progress toward goal attainment; and incentives, reinforcements, and supportive changes in the food environment.

- Interpersonal counseling and education, whether individually or in small groups, are more likely to be effective in facilitating behavioral change if they are tailored to the specific needs of the individuals.
- The important role of social support, such as family and peer involvement, was documented in studies involving all population groups. For example, in preschool and younger school-aged children, family support enhanced the effectiveness of a classroom component. Peer educators, both for breastfeeding mothers and older adults, provide social support that can enhance effectiveness.
- An empowerment approach that includes enhancing personal control was useful for older children, adults, and older adults. Many studies involving school-aged children and adults specifically targeted self-efficacy. Involvement in activities, such as gardening by older adults, provided a renewed sense of personal control and hope that influenced several health behaviors, including dietary choices.

Environmental interventions.

- Point-of-choice interventions in grocery stores and eating establishments can be highly effective in changing purchase intentions and behavior; however, they are usually effective only while the intervention lasts, and affect the purchase of specific items, rather than the total nutritional quality of a meal or overall diet.
- Intervening in the food environments in schools, worksites, and communities is important for maintenance of long-term change. Studies have shown that school meals can be modified to make them more healthful, and interventions targeting both the classroom and school lunch program had positive effects on some behaviors. Changes have also been made in the quality of foods available for selection at the workplace cafeteria or in vending machines. Availability and accessibility of healthful foods in restaurants and other settings in the community support the maintenance of change.

Community activation and organization.

- Active participation of community leaders and members through community organization and empowerment is likely to improve long-term effectiveness. This was seen in community-level interventions, where extensive involvement of existing leadership from the beginning and ongoing involvement of organizations and volunteers helped the programs to become infused into the life of the community. The emerging public health approach to worksite nutrition education includes employee participation in the design and implementation of the intervention.

IMPLICATIONS FOR NUTRITION EDUCATION POLICY AND PROGRAM IMPLEMENTATION

The conclusions from the review of studies have implications for nutrition education policy and program implementation. These are described below under various categories.

General Implications.

- The successful elements described above should be implemented in programs sponsored by federal, state, and local governments, as well as by private voluntary organizations.
- Successful interventions should be widely disseminated. Many behaviorally based disease-risk education programs for school-aged children and adults have been shown to be at least moderately effective in developing behavioral skills and encouraging behavioral change. The government or other credible and unbiased funding sources should make these available to teachers and school districts, community organizations, and others.
- Descriptions of effective educational strategies used in interventions should be made available to others so that researchers and program planners do not have to reinvent the wheel or duplicate mistakes. The actual interventions used in the various studies reviewed, as well as the strategic and formative research on which they were based, are rarely published in journal articles and are often not available, nor are processes by which the interventions were implemented always described. Existing resource centers could make available such information from successful programs.

Communication and educational strategies.

- Goals and outcomes of interventions need to be clearly identified. Goals need to be clearly set for not only the nutrition content of the intervention (i.e., what dietary guidance principles will be used) but also for the educational outcomes desired (i.e., whether the outcome will be environmental change, individual behavioral change, or change in other mediating variables such as knowledge, beliefs, self-efficacy, attitudes, or behavioral intent). In many programs, there is a mismatch between the stated goals related to dietary change and a didactic, information-based educational methodology.
- Mass media should be used more frequently to increase awareness and enhance motivation. In particular, media campaigns for children and adolescents should be implemented, since the time allocated for nutrition education in schools is not sufficient to bring about adequate changes in attitudes or behavior. Paid advertising as part of the total media mix may be extremely helpful in

interventions to determine how exposure to and awareness of media campaign elements are related to outcomes.

- Work on understanding community organization needs to be extended and shared. Case studies on the identification and effective activation and integration of community resources for nutrition education would be highly useful for people who are designing, implementing, and evaluating programs. Research on the diffusion and institutionalization of practices in a wide variety of communities is urgently needed.
- Community-level studies should, on the one hand, explore broad-based but not "bigger and better" programs built around public policy initiatives combined with the nutrition education strategies that have been identified as effective. On the other hand, there is a need for more focused studies within communities, especially studies that test various strategies and target population subgroups that have not been reached successfully.

Tailoring messages for different target groups.

- Nutrition education content messages need to be tailored to the audience. We need more research on people's perceptions of benefits and barriers to healthier dietary habits. Within audience segments, what characterizes the people who have been successful in changing and maintaining these practices? We need more work to understand the motivations, concerns, and meanings food has for different populations. For example, among other concerns, how do environmental or ecological concerns motivate food-related behavior change? Segmentation efforts should also take into account various subpopulations that are often under-represented in many interventions, such as women, adults with low literacy, children living in poverty, African-Americans, Hispanics, Native Americans, and Asian-Americans. For example, sometimes simply offering a bilingual version of the same program may be effective. At other times, an extensive cultural adaptation may be necessary. Differences in approaches need to be explored.

Evaluation.

- Careful evaluation should be an integral part of all nutrition education programs that are developed with the intent of widespread adoption or national distribution. Rigorous outcome evaluations using appropriate designs are important. Process evaluations in real-world contexts are also extremely important to explain outcome results.
- Appropriate tools are needed for evaluating eating behavior and food-related behavioural change skills. There appears to be increasing consensus that we need information, not only on biomedical outcomes or behavioral change, but on a variety of antecedent variables or proximal effects as well. These could include health values; sense of personal empowerment; self-efficacy; behavioral intent; and cognitive, affective, and behavioral skills. More data collection tools that are appropriate for intended outcomes must be developed and validated.

SUMMARY

Nutrition education programs need to be ongoing and multifaceted. Improving the dietary behavior of individuals and communities is not short-term work. It takes time to facilitate the progress of individuals and communities through various stages of change. It is a process that changes and continues—from awareness, through motivation levels, through how-to enabling activities, to maintenance of change. Other powerful environmental forces that encourage people to eat in less healthful ways do not stop with the program; that is, the competition remains robust. Consequently, the motivators and reinforcers of change and the environmental supports need to be multifaceted, continually updated, and maintained.