

Background

The WIC Nutrition Education Demonstration Study was conducted by Abt Associates, Inc. for the Food and Nutrition Service (FNS) of the US Department of Agriculture. The study evaluated the effectiveness of three innovative approaches to nutrition education in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). Two of these education innovations were designed for educating prenatal women; the third focused on nutrition education for three-and-four-year-old WIC participants. This executive summary and report describe the evaluation and results of the educational interventions for prenatal women.

Note: The knowledge assessment tool used in this study has limitations that should be recognized by all readers. It is strongly recommended that you read the study's Foreword for more information on this issue.

The WIC Program was established in 1972, as an amendment to the Child Nutrition Act of 1966, to counteract the negative effects of poor nutrition on the prenatal, postpartum, and pediatric health of low-income individuals. A combination of direct nutritional supplementation, nutrition education and counseling, and increased access to health care and social services is offered to pregnant, breastfeeding, and postpartum women; infants; and children up to the age of five years. WIC provides supplemental foods that are good sources of the nutrients most likely to be lacking in the diet of low-income populations—protein, iron, calcium, and vitamins A and C. In most States, WIC clients receive WIC food instruments (vouchers or checks) with which they purchase specific food items at participating retail stores.

To receive WIC benefits, an individual must be categorically eligible (a pregnant woman, for example); must reside in the State in which the application is filed; must be income eligible (usually defined as equal to or less than 185 percent of the federal poverty income guidelines); and must be at nutritional risk.

Nutrition education plays a critical role in WIC and is intended to influence participant nutrition and health-related knowledge, attitudes, and behaviors. Federal WIC regulations require WIC service providers to offer participants, at no cost, at least two nutrition education sessions during each certification period. Although WIC participants are not required to attend nutrition education, local WIC agencies often schedule nutrition to coincide with food instrument issuance to encourage WIC clients to attend. Education on a variety of health and nutrition-related topics may be provided in individual counseling sessions, through group classes, or via films and videos. Whatever the delivery form, education must stress the relationship between proper nutrition and good health.

Study Design and Objectives

This study had three primary components: developing nutrition education interventions; implementing these innovative methods of nutrition education at selected WIC sites; and designing and conducting a study to assess the relative effectiveness of traditional and innovative WIC nutrition education in increasing participant knowledge about nutrition.

This study was limited to assessing the effects of innovative approaches on nutrition knowledge of prenatal WIC participants. It did not address the important issue of changes in nutrition behavior that could result from nutrition education. While this issue is important, it was beyond the scope of this study and must be investigated elsewhere. Developing Nutrition Education Interventions

The innovative nutrition education taught during the demonstration (1) contained nutrition information appropriate for prenatal women; and (2) employed teaching methods that made this information accessible and interesting to WIC participants. It was hypothesized that such innovations would be more effective than the traditional nutrition counseling and group education currently used in WIC clinics.

Specific nutritional concepts were identified by a review group including FNS staff, Abt staff, and several technical consultants. The primary objective was to define the broad scope of appropriate knowledge for prenatal women. However, for practical reasons—such as time available for nutrition education at local WIC agencies, the review group recommended, and FNS approved, limiting the focus of nutrition education to a common core of nutrition information on the topic, pregnancy and nutrition. This topic included five components: Food Guide Pyramid; diet for pregnancy; food choices: everyday versus sometimes foods; nutrients for healthy mother and baby; nutrients in WIC foods.

Two innovative nutrition education interventions were chosen to teach pregnant WIC participants about pregnancy and nutrition. Two different interventions were needed—one that employed individual counseling and a second for group education—because both educational forms are currently used in the WIC Program, and the innovative interventions needed to match these traditional educational forms. The innovative individual intervention was a touch-screen video comprised of a five-module curriculum, *What to Eat When You're Pregnant*. This curriculum, prepared by FNS and the New England Technology Group, was based on a computer-assisted video developed by the Maine WIC Program. The innovative group intervention used a curriculum entitled *Eating for Two* developed by the Michigan WIC Program in cooperation with the United Dairy Council of Michigan. This curriculum was presented through "facilitated" group instruction, in which the nutritionist acted as a facilitator, not a lecturer, and in which the focus was on

behavioral change rather than knowledge acquisition.

Implementing the Demonstration

The interventions were implemented in six WIC demonstration sites. Three sites offered individual nutrition education using the touch-screen video; three other sites applied the facilitated group intervention. FNS selected the demonstration sites and assigned them to individual or group nutrition education, matching each site's traditional mode of nutrition education for pregnant women with its demonstration intervention type. A key selection criterion was caseload size. A large caseload was essential in order to recruit sufficient numbers of respondents as demonstration participants in a reasonably short period of time.

FNS provided the demonstration sites with training and materials for the interventions. The sites implementing the innovative individual intervention received computer hardware and software for the touch-screen program. For the sites using facilitated group counseling, WIC staff attended a two-day training on implementation. The demonstration began in February 1996.

Implementation of the demonstration was documented through a process study conducted by Abt Associates. Information on traditional and innovative nutrition education was obtained through interviews with nutrition educators at local WIC agencies; review of materials used in traditional nutrition education sessions; and on-site observations of innovative and traditional nutrition education.

Designing the Research Study

An experimental design was implemented in each of the six demonstration sites, in which prenatal WIC applicants were randomly assigned to one of three groups: the traditional group, who received the nutrition education already being provided at that site; the innovative group, who received one of the innovative WIC nutrition education models—individual counseling using the touch-screen

video or facilitated group counseling; or a control group who received nutrition education after the intervention period ended.

The same procedures were used at all demonstration sites. Prenatal applicants who came to WIC to apply for benefits were recruited into the study and immediately pretested on their nutrition knowledge before they were certified for WIC benefits or received any nutrition counseling. The measure of knowledge was a test which was developed for this study and which focused on the core nutrition topics noted above. Subsequent to pretesting, each applicant who was certified as eligible for WIC benefits then received traditional individual nutrition counseling during the certification session. Every study subject, including members of the control group, received one individual nutrition education counseling session at this initial contact.

Each WIC participant was then scheduled for a subsequent (follow-up) nutrition education contact which usually coincided with food voucher/check issuance and occurred four to eight weeks after certification. Depending on group assignment, the follow-up contact consisted of either the traditional nutrition education provided at that site followed by a post-test; the innovative counseling/education at that site followed by a post-test; or, for each control subject, the post-test followed by nutrition education.

Applying a classic experimental design with randomization of subjects constructed groups that, except for the intervention, can be assumed to be statistically equivalent in all other respects. Applying this methodology means that, in this study, any differences in nutrition knowledge from pre- to post-test can be attributed to the educational intervention.

Developing the Test of Nutrition Knowledge

Abt staff developed the nutrition knowledge test, beginning with a pool of test items on pregnancy and nutrition. Through an iterative process, the original eighty questions on pregnancy and nutrition were carefully evaluated for their

adequacy across precise criteria—item content must be linked to a specific topic, for example. Three rounds of pilot testing resulted in a third (and final) form of the test containing seventy-six items. Sixteen (21 percent) of the test items were specific to nutrition knowledge and pregnancy. The remainder measured general nutrition knowledge. The pilot test assessed reliability and validity to ensure that the test measured what it says it does and results in "true" scores for all participants. The acceptable items were placed into two forms of the test so that women would receive different tests at each of the two testing points. This step was deemed necessary because using the exact same test form in a period of less than two months might lead to a memory effect for respondents.

Analysis. The research study consisted of a repeated-measures design with two time points (pretest and post-test) and three groups (traditional, innovative, and control). The effect of nutrition education (post-test score in nutrition knowledge) was estimated using least squares regression which adjusted for each subject's nutrition knowledge pretest score, the WIC site, and five other demographic variables (age, ethnicity, education level, trimester at enrollment, previous WIC certification).

The Demonstration/Research Sample

Two issues are of import here:

- Using randomization to create statistically equivalent treatment and control groups in terms of demographic characteristics.
- Ensuring that the demonstration enrolled sufficient numbers of study participants to justify studying the effects of the nutrition education interventions.

Analyses of five demographic variables (age, trimester at enrollment in WIC, race/ethnicity, education level, and prior WIC participation) found that the three treatment groups (innovative, traditional, control) were statistically equivalent across sites. The final analysis sample consisted of 1,926 prenatal WIC participants who were eligible for WIC benefits,

were judged to have low-risk pregnancies, attended follow-up nutrition education, and completed the post-test.

A problem faced in all of the demonstration agencies was low attendance at both innovative and traditional nutrition education. To offset these attendance difficulties, WIC and study staff performed extra recruiting efforts, and some sites offered additional incentives so that attendance rates at follow-up nutrition education increased to 85 percent. For the research study, the educational interventions were implemented at a sufficiently high level to ensure the validity of assessing demonstration impacts.

Findings

The first question addressed by the demonstration was whether or not the educational interventions were successfully implemented in local WIC agencies. Information from the implementation study indicates that local WIC was able to put the interventions in place but that implementation was difficult. Some of these difficulties, as noted below, affected findings from the research study.

Finding 1

Neither the innovative or traditional intervention increased nutrition knowledge among prenatal WIC participants.

With one exception, post-test results indicated that there was no increase in nutrition knowledge among prenatal WIC clients who participated in the demonstration. In general, results were similar across types of interventions (innovative, traditional) and across nutrition topics.

Several factors seem likely to have contributed to this finding.

The content of the test did not necessarily correspond with the topics addressed by the nutrition education interventions. Questions on the test were based on a core content of nutrition knowledge considered essential to prenatal women and identified by a panel of experts

convened by FNS. The interventions were developed separately and independently from the test. This lack of congruence between test questions and content of the interventions may at least partially explain participant test performance.

Although nutrition education information was available to demonstration participants, it appears that many women did not avail themselves of these materials. Observation data suggest that women in the innovative individual education programs viewed only one or two modules of the five-module touch-screen video. Also, innovative group sessions often did not present all of the content in the instructional packages.

Finding 2

Prior to attending nutrition education, demonstration participants possessed, on average, approximately 50 percent of nutrition knowledge covered by the knowledge test.

Pretest results indicated that, prior to being certified for WIC benefits, demonstration participants correctly answered about half of the nutrition knowledge items on the test. It may be that limited time and resources are used to present and reinforce information already possessed by prenatal WIC participants while some areas go unaddressed. These issues particularly deserve consideration when we note that subjects previously certified for WIC did not achieve higher scores than first-time WIC participants.

Finding 3

Until additional efforts were initiated, attendance at second contacts for WIC nutrition education was low across all demonstration sites.

Participation in second contacts for nutrition education was low at all demonstration clinics. There is no requirement that WIC clients attend these second nutrition education contacts to receive benefits which may be a principal reason for the low participation rate. The availability of

innovative nutrition education did not appear to increase attendance among prenatal WIC participants. In fact, in this study, WIC and research staff initiated extraordinary effort, using telephone and post card reminders, to increase attendance at nutrition education. Two demonstration sites employed monetary incentives to encourage attendance. Without these special efforts, it is unlikely that the demonstration would have achieved attendance levels of sufficient size for analysis.

Demonstration results also indicated that participation rates had no effect on nutrition knowledge. Participants at demonstration sites with high attendance at nutrition education did not score differently from individuals at sites with lower attendance.

Finding 4

Innovative individual educational interventions were more difficult to implement than the group intervention chosen for this demonstration.

Any form of individual nutrition education, including traditional one-to-one counseling, is difficult to implement, monitor, and maintain. Demonstration results suggested that individual nutrition education may require more planning and attention to implement as well as substantial resources to maintain and monitor participant learning. All of the demonstration sites using the touch-screen videos encountered considerable implementation and maintenance problems which may well have affected outcomes.

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