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Dietary Changes by Expanded Food and Nutrition Education Program (EFNEP) Graduates Are Independent of Program Delivery Method

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Dietary Changes by Expanded Food and Nutrition Education Program (EFNEP) Graduates Are Independent of Program Delivery Method

Abstract
Dietary changes of Expanded Food and Nutrition Education Program (EFNEP) graduates who participated in either individual or group education sessions were assessed. Paraprofessionals administered the Homemaker's 24-Hour Food Recall to EFNEP graduates. EFNEP graduates significantly improved the number of servings consumed from the grains, vegetables, dairy, and meat and meat alternates food groups. Graduates also significantly increased total calories consumed, dietary fiber intake, as well as iron, calcium, vitamin A, vitamin C, and vitamin B6 intake. These results were independent of method of nutrition education. Further research should determine the reasons why group instruction is as effective as individual instruction.

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Introduction

The Expanded Food and Nutrition Education Program (EFNEP) was established in 1969 to provide education to limited resource audiences with the goal of reducing levels of food insecurity and improving their nutritional health. EFNEP, administered by the Cooperative Extension Service in all 50 U.S. states, employs paraprofessionals to help families improve dietary practices and to more effectively manage their available resources. The paraprofessionals provide intensive nutrition education in a variety of non-formal educational settings, including homes, community centers, housing complexes, WIC offices, and churches.

Innovative program delivery methods and program curriculum, such as videos and interactive CDs, have been incorporated into EFNEP. When the program was initiated, instruction was conducted primarily in the home through one-on-one education. In the 1980s, program emphasis shifted from individual instruction to instruction provided in groups (United States Department of Agriculture, 1983).

The primary objective of the study discussed here was to determine whether differences in group or individual instruction affect the level of change in dietary practices. The study addressed the need for investigation into effective techniques for nutrition education (Shafer, Gillespie, Wilkins, & Borra, 1996) as well as the evaluation of the immediate effects of EFNEP on a diverse audience

with a large sample (Arnold & Sobal, 2000). Information obtained from the study may provide direction to EFNEP and other nutrition education programs for cost-effective educational programming.

Methodology

Participants

The population for the study was 1141 graduated EFNEP participants in South Carolina during the reporting period October 1, 1996 to September 30, 1997. The participants were 63% rural; 53% had incomes of less than 50% of poverty level; and 54% received Food Stamps and Thirty-two percent were Caucasian; 66%, African American; 1%, Asian; and 1%, Hispanic. Of the participants, 76.2% were taught in a group setting; 21.3% received individual instruction; and 2.5% received a combination of both. A minimum of 12 education sessions was required for a participant to be considered a "graduate."

Instrumentation

The Adult Enrollment Form (Family Record) and Homemaker's 24-Hour Recall developed for the national EFNEP Reporting System (ERS Version 4.02, CSREES, Washington, DC) were used in the study. The Adult Enrollment Form is used to collect demographic information such as age of participant, race, and place of residence. The 24-hour recall is a standard 24-hour dietary recall form used to record everything participants have eaten and drunk in the previous 24 hours and has been used by USDA since 1965 in nationwide food consumption surveys (Pao, Sykes, & Cypel, 1989). The 24-hour recall method is widely used due to its ease of administration and has been shown to be an acceptable method of assessment for the purpose of surveying group trends (Karvetti & Knuts, 1985; Murphy, Kaiser, Townsend, & Allen, 2001; Resnicow et al., 2000).

The questionnaires were administered to homemakers upon enrollment, after six education sessions, and at graduation.

Statistical Analyses

Program effectiveness was defined as statistically significant positive behavioral change in food intake as reported by program participants on the Adult Enrollment Form. Data collected in the project were analyzed using the Statistical Package for the Social Sciences (SPSS Inc., 1998). Paired-samples t-tests were used to analyze differences in pre- and post-program levels of intake. Independent-samples t-tests were used to compare differences in intake among participants educated with group methods and participants educated through individual methods. Levels of statistical significance were determined at the $p<0.001$ level unless otherwise noted.

Results

Servings from the Food Guide Pyramid

Based on the Food Guide Pyramid, a balanced diet includes 6-11 servings from the grains group, 2-4 servings from the fruits group, 3-5 servings from the vegetables group, 2-3 servings from the dairy group, and 2-3 servings from the meats and meat alternates group (United States Department of Agriculture, 1996). Prior to graduating from the program, participants were not consuming the recommended number of servings in the grains, fruits, vegetables, and dairy food groups (Table 1). Graduates increased their number of servings from the vegetables group to within the recommended range. However, the number of servings reported in the grains, fruits, and dairy groups remained less than the recommendations. The number of servings from the meat and meat alternates group was within the recommended range before and after program participation.

Even though graduates did not achieve the recommended number of servings from some food groups, there were significant improvements in the number of servings consumed from the grains ($p<0.01$), vegetables ($p<0.001$), dairy ($p<0.001$), and meat and meat alternates ($p<0.001$) food groups. However, there was not a significant improvement in the number of servings of fruit consumed. Whether participants received nutrition education in a group or individual setting did not have a significant effect on pre- and post-program results.

Caloric Intake

The mean number of calories consumed by graduates increased significantly, by nearly 150 calories. At program completion, graduates consumed significantly more ($p<0.001$) grams of carbohydrates, protein, and fat than at program initiation. There was no effect of teaching method on these improvements.

Fiber Intake

The recommended intake of dietary fiber for adults is 25 - 30 grams per day (Van Horn, 1997). Fiber consumption improved significantly ($p<0.05$) from program initiation to program completion. There was no difference in this improvement between those who participated in group education sessions and those who participated in individual education sessions.

Vitamin and Mineral Intake

Intake of selected vitamins and minerals improved significantly ($p<0.001$) during EFNEP participation. Iron intake increased 13%; calcium intake increased 16%; vitamin A intake increased 32%; vitamin C intake increased 20%; and vitamin B6 intake increased 21%. These improvements, too, were independent of method of nutrition education.

Table 1.
Changes in the Mean Number of Food Group Servings, Vitamins and Minerals, Nutrients, and Calories and Fiber by EFNEP Graduates [1]

	Pre-Program		Post-Program	
	Mean	**SD [2]**	**Mean**	**SD**
Number of Servings				
Grains *	4.9 [b]	3.4	5.3 [a]	3.2
Fruits	1.1 [a]	4.5	1.3 [a]	2.8
Vegetables	2.8 [b]	3.0	3.7 [a]	3.8
Dairy	1.0 [b]	1.3	1.2 [a]	1.3
Meat and Meat Alternates	2.1 [b]	1.7	2.3 [a]	1.8
Vitamins and Minerals				
Iron (mg)	11.0 [b]	8.0	12.5 [a]	8.7
Calcium (mg)	572 [b]	453	664 [a]	446
Vitamin A (ug RE)	797 [b]	1152	1056 [a]	1175
Vitamin C (mg)	83 [b]	154	100 [a]	82
Vitamin B6 (mg)	1.4 [b]	1.0	1.7 [a]	1.2
Nutrients				
Carbohydrates (g)	197 [b]	129	216 [a]	187
Protein (g)	65 [b]	42	73 [a]	41
Fat (g)	63 [b]	43	67 [a]	46
Calories and Fiber				

Calories (kcal)	1586 [b]	914	1732 [a]	963
Fiber (g) **	12 [b]	13	14 [a]	11

[1] Means in a row with different letters are significantly different (p <= 0.001) unless otherwise noted.
[2] Standard deviation
* (p <= 0.01)
** (p <= 0.05)

Discussion

Data from the Continuing Survey of Food Intakes by Individuals (CSFII) reveals that the average American diet contained almost 2000 kcal per day (United States Department of Agriculture, 1997). The average diet of EFNEP graduates contained 13% fewer kcal than the average American diet. The average American diet contained 52% of kcal from carbohydrates, 33% of kcal from fat, and 15% of kcal from protein; similarly, EFNEP graduates consumed 49% of kcal from carbohydrates, 34% of kcal from fat, and 17% of kcal from protein.

Despite improvements in number of servings consumed from the grains and dairy groups, EFNEP graduates still were not consuming the recommended number of servings from these food groups. Participation in EFNEP did not improve intake of fruit group foods. Graduates were meeting the lower range recommendations for the vegetables and meat and meat alternates groups. The greatest gain by EFNEP graduates was made in the vegetables group, with the mean number of servings increasing by 0.9.

The results of the study indicate that EFNEP is effective in implementing significant positive dietary changes in its graduates and that improvements are independent of the type of education setting. There were no significant differences in dietary changes among graduates of EFNEP who received nutrition education in group settings and those who received nutrition education on an individual basis.

Other reports indicate similar results with a variety of audiences. Ashley et al. (2001) report that weight loss interventions incorporating meal replacements are effective for weight control in both the physician's office setting and the dietitian-led group setting. Group nutrition education classes are just as effective in modifying behavior as an individual self-paced nutrition education program among employees at different worksites (Anderson & Dusenbury, 1999).

According to Randall, Brink, & Joy (1989), the success of EFNEP has been attributed to several factors. First is the use of paraprofessionals in education program delivery. The use of former EFNEP participants as program volunteers is another key factor in the program's success. EFNEP also tailors educational efforts to the needs, interests, financial resources, age, ethnic backgrounds, and learning capabilities of the participants. This tailored approach and the flexibility of duration and content have also been identified as factors contributing to the program's success (Randall, Brink, & Joy, 1989).

Recommendations

EFNEP continues to be an effective model for providing participants with the nutrition knowledge needed to make positive dietary changes. However, studies should be conducted beyond the scope of this research to provide additional information. Studies that include EFNEP populations in other states and low-income populations who are in the workforce would add to the literature.

Hebert et al. (2001) conclude that group nutrition interventions do result in positive behavior changes, although the effectiveness and maintenance of adherence may require additional support, including periodic individual meetings or group booster sessions. It is therefore likely that EFNEP graduates may benefit from follow-up instructions to maintain nutrition knowledge and behavior changes.

Based on the results of this study, several principles should be stressed in future EFNEP educational interventions.

- Low-fat food choices and employment of low-fat cooking methods to decrease fat consumption should be identified.
- The consumption of fruits and vegetables should be further encouraged using the 5-A-Day message.
- The consumption of fiber through an emphasis on whole grain breads and cereals, and especially on beans (which are not only high in fiber, but low cost, low fat, and a source of protein) should be further encouraged.
- The consumption of dietary calcium through the identification of low-fat dairy products and nondairy foods high in calcium should be further encouraged.

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