

Use of a “Contract for Change” and Biochemical Markers to Evaluate the Effectiveness of Nutrition Education to Increase Fruit and Vegetable Consumption in Low Income Women

Introduction and Methods:

The purpose of this investigation was to determine the effectiveness of pairing personalized goal-setting exercises within community based nutrition education programs to promote behavior change in a low-income population. It was hypothesized that through an increased sense of self efficacy, the goal setting group would have the following outcomes: 1) advance within the stages of change model toward accepting dietary change, 2) increase produce consumption to a greater extent than the other groups, and 3) increase markers of fruit and vegetable intake.

This intervention targeted English speaking, low-income women who were potential recipients of University of California Cooperative Extension (UCCE) Expanded Food and Nutrition Education (EFNEP)/ Food Stamp Nutrition Education (FSNE) programs. After recruitment, women were randomly assigned to a treatment and asked to attend four one-hour classes over four weeks: 1. Control Group: this group received the "Gateway to a Better Life" series discussing money management. 2. Education Group: this group received the "Food Guide Pyramid" series currently in use by California EFNEP/FSNE. 3. Contract Group: this group also received the "Food Guide Pyramid" series. In addition, women completed a "Contract for Change" goal setting exercise at the initial meeting, and were reminded of their goals at subsequent classes. The "Contract for Change" tool was adapted from previous work demonstrating effectiveness to focus on dietary goals appropriate for our target population. Outcome measures were assessed three times, both pre and post intervention, and with a final assessment occurring one month after intervention completion to evaluate whether the anticipated dietary changes were maintained.

Three validated assessment tools were used to collect dietary information from the participants. The Health Beliefs questionnaire appraised the study participants readiness to make a dietary change, as based on Prochaska's stages of change model. The Food Behavior Checklist determined food consumption patterns among the target population. Finally, the Fred Hutchison Food Frequency Questionnaire used both the five-a-day method (seven items including a summary question for fruit and a summary question for vegetables) and the summation method (100 + items presented in a list format) to estimate the number of fruits and vegetables consumed by the study population.

Results and Discussion

Three hundred and forty-five women were screened for this study. From this cohort, sixty-five (19%) clients were enrolled, thirty-eight (58%) completed surveys at the final time-point, and thirty-five (54%) completed surveys at the follow-up time point. Due to dropouts, the treatment groups were greatly skewed. Five women completed the control lesson series (13%), fourteen completed the education lesson series (37%), and nineteen (50%) completed the contract lesson series. There were no significant differences between the three groups with respect to age, ethnicity, or residence.

Based on responses to the Health Belief's Questionnaire, the contract group made significantly more advances (movement) in stages of change toward acceptance of vegetable consumption in comparison to the control group. Movement through stages of change for the education group was not significantly different from the other two groups. Acceptance of fruit consumption was relatively high for all groups. No significant changes were observed.

Data from the Food Frequency Questionnaire showed a significant increase in five-a-day estimations of fruit consumption between the baseline and final time points for the contract group in comparison to the education group. No other significant increases were observed between these two time-points. Change at follow-up was observed between the contract and education group for both five-a-day and summation estimations of fruit consumption. Estimations of β -cryptoxanthine and vitamin C intake significantly increased in the contract group, supporting these observations. The decrease in produce consumption observed in the education group may be explained by a better understanding of a serving size after completion of the lesson series. No significant differences were observed for either method of vegetable consumption estimation, although a trend toward increased vegetable consumption was observed in the contract group. Finally, the Food Behavior Checklist showed significant differences between the education and contract groups at follow-up for self estimated fruit consumption. Due to a small group size, the control group was not significantly different from either group for any of the fruit and vegetable estimations. The results of this study demonstrate that tailored goal setting exercises, paired with nutrition education, can be an effective means for nutrition professionals to facilitate dietary change in a low-income population. The major limitation to this study was the relatively small number of participants. We believe our recruitment challenges can be attributed to three different factors: 1) We originally planned to assess

biochemical markers of produce consumption. Due to this factor, many potential subjects chose to decline participation. 2) Due to a dearth of bilingual validated theory based assessment materials, all women participating in the intervention had to be fluent English speakers. 3) Finally, the diversity of the target populations in multiple county sites proved to be an additional barrier to recruitment. Future investigations recruiting in a more homogenous area with a targeted intervention may have greater success.

Project Implications

In the United States, the rates of chronic diseases such as cardiovascular disease, diabetes mellitus, and obesity continue to rise. United States Department of Agriculture (USDA) research shows low-income families spend a significant portion of their limited resources on fats, sweets, and alcohol rather than on more nutritious alternatives. This is concerning given that fruits and vegetables are important sources of vitamins, minerals, fiber, and phytochemicals, and diet is a modifiable risk factor known to significantly affect chronic disease risk. It is important that preventative measures, such as improving the dietary quality of Americans, be the focus of nutrition public policy and education in efforts to try and reduce personal and economic costs. The challenge for government and nutrition educators is how to facilitate at risk populations in making positive dietary changes and to overcome barriers to fruit and vegetable consumption. It is crucial to find mechanisms which will help increase the effectiveness of education efforts to align actual behaviors with the newest dietary guidelines for fruit and vegetable intakes to promote optimal health. The results of this study show that goal-setting exercises can be an easy and effective means to increase produce consumption in existing community based education programs targeting low-income women without modifying existing barriers. The California State EFNE/FSNE program has adopted the "Contract for Change" as a tool for county educators. However, implications are broader than just these programs. The application of goal setting techniques as adjuncts to targeted nutrition education approaches, in other government programs such as WIC, have the potential to reach a wider section of the population.