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Research report

The impact of goal attainment on behavioral and mediating variables among low income women participating in an Expanded Food and Nutrition Education Program intervention study☆

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ABSTRACT

This study examined the relationships between participant goal attainment and changes in mediating variables and food choice outcomes from a modified curriculum for the Texas Expanded Food and Nutrition Education Program (EFNEP) promoting healthy home food environments and parenting skills related to obesity prevention. EFNEP participants in 54 intervention classes received a goal sheet after each of 6 classes. Participants recorded goal attainment and returned at the next class, Diet and mediating variables were measured at baseline, immediate post, and 4 months later. Mixed model regression analysis over time assessed whether goal attainment was associated with the outcomes at post or follow-up, controlling for baseline assessment. Participants who reported attaining more goals reported greater self-efficacy for planning/encouraging fruit and vegetable consumption and making fruit and vegetables available, menu planning skills, improvement in the food preparation practices and higher home availability for regular vegetables. At post, those who reported attaining more fiber, vegetable, and water goals reported consuming more of these items. Goal attainment was related to some changes in food choice and mediating variables in an at risk population. Further research into the use and efficacy of goal setting and attainment in this population is warranted.

Introduction

Obesity is a serious problem in the United States for both children and adults (Ogden, Carroll, Curtin, Lamb, & Flegal, 2010) and is associated with both medical (Finkelstein, Trogdon, Cohen, & Dietz, 2009) and economic costs (Finkelstein, French, Variyam, & Haines, 2004; Hampl, Carroll, Simon, & Sharma, 2007; Wang & Dietz, 2002). The Expanded Food and Nutrition Education Program (EFNEP), sponsored by the US Department of Agriculture, provides food and nutrition education to limited-resource families, who often have high rates of obesity (Bennett, Wolin, & James, 2007; Ogden et al., 2010; Wang & Dietz, 2002). An obesity prevention component to EFNEP classes was developed through formative research with Texas EFNEP clients (Thompson, Cullen, Lara-Smalling, Scott, & Konzelmann, submitted for publication), and was recently evaluated (Cullen et al., 2009). Based on EFNEP client feedback during development, the Social Cognitive Theory (SCT) constructs of modeling, self-control, self-efficacy, behavioral skills, and the environment were incorporated into each of the six intervention classes (Bandura, 1986; Thompson et al., submitted for publication). Self-control was operationalized *as the ability to attain goals,* which enables individuals to select and focus on a behavior to improve (Bandura, 1986; Thompson et al., 2007). Fig. 1 shows the conceptual framework for the Building Healthy Families intervention and the goal setting component. The intervention achieved reductions in BMI for the intervention participants at the

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end of the 8-week program, but these results were not maintained 4 months later (Cullen et al., 2009).

While many dietary and physical activity behavior programs include goal setting to guide the behavior change process, there are few published papers that investigate the contribution of goal attainment to outcomes (Cullen, Baranowski, & Smith, 2001). A review published in 2004 investigated the use of goal setting in dietary and physical activity behavior change interventions (Shilts, Horowitz, & Townsend, 2004). Of the 28 studies met inclusionary criteria, only 13 of 23 adult studies examined the effectiveness of goal setting and 8 of these showed positive effects on diet and physical activity behaviors (Shilts et al., 2004). However, the relationship between goal attainment and outcomes were not reported. No such studies were found for children and adolescents.

More recent research also supports the positive impact of goal setting. Goal setting was related to self-efficacy, commitment and intention about attaining goals, as well as changes in goal-related physical activity for adults in a 12-week workplace intervention promoting physical activity (Dishman, DeJoy, Wilson, & Vandenberg, 2009). Goals for pedometer steps and weekly minutes of physical activity increased during the intervention, as did the actual pedometer steps and minutes of activity reported by intervention participants (Dishman, Vandenburg, Motl,Wilson, & Dejoy, 2009). Middle school students who attempted goal setting reported greater improvements in dietary behavior and physical activity behavior after the intervention, compared to the students who did not use goal setting (Shilts, Horowitz, & Townsend, 2009). For high school girls, having a goal for physical activity mediated the paths between self-efficacy and intention and intention and perceived behavioral control (Dishman et al., 2006).

A program with fourth grade children analyzed the impact of goal attainment in each session on fruit and vegetable intake (Cullen, Zakeri, et al., 2004), as well as the influence of attaining goals for preparing recipes (Cullen, Watson, Zakeri, Baranowski, & Baranowski, 2007). Complex relationships were detected; results depended on baseline fruit and vegetable preferences and consumption. For example, children with low baseline fruit and juice preferences who reported attaining more fruit-juice consumption goals reported greater fruit-juice intake at post assessment (Cullen, Zakeri, et al., 2004). For boys and those with high baseline fruit, juice, and vegetable (FJV) consumption, attaining three general goals was associated with higher FJV consumption (Cullen, Zakeri, et al., 2004). Students with the highest baseline vegetable consumption who achieved two or three vegetable recipe preparation goals reported the highest post vegetable consumption (Cullen et al., 2007).

This manuscript focuses on the impact of goal attainment on the changes in diet and mediating variables for the intervention clients in the EFNEP study (Cullen et al., 2009). Based on the goal setting literature, it was hypothesized that successful goal attainment would be positively related to successful intervention outcomes. Intervention clients who attained more intervention goals would report greater positive changes on home availability and consumption of fruit, vegetables, and low fat milk products, and significant improvements in menu planning skills, parent self-efficacy, home food preparation practices, and barriers to healthy eating compared to intervention clients who attained fewer goals.

Methods

This study was approved by the Institutional Review Board at Baylor College of Medicine, Houston, Texas. Extension agents in three Texas cities recruited 100 EFNEP classes between February, 2006 and March, 2007, for this study. Research staff in Houston used a random numbers table to assign classes to intervention (54) or control (46) condition, by city. The Texas EFNEP has 6 weekly sessions and three data collection class sessions were added for this study: baseline (session 1), post (session 8), plus a 4-month follow-up session. Two EFNEP teachers in each city were trained to deliver the modified curriculum and 2 to 4 other staff were trained for data collection. The EFNEP class teachers recruited clients from these 100 classes to participate in measurement activities. All participants provided written informed consent and received a small gratuity ($20) for each data collection. About 88% of the clients registered for the classes provided consent; there were between 5 and 24 clients in each class. The intervention was considered usual practice because it covered the basic EFNEP materials in the usual class. The six EFNEP classes were conducted during weeks 2–7 for all 100 classes. Details on intervention development (Thompson et al., submitted for publication) and the evaluation study outcomes (Cullen et al., 2009), are presented elsewhere.

The six-session Texas EFNEP class topics presented to the adult clients were (1) nutrition basics and portion size, (2) breakfast and snacks, (3) fruit and vegetables, (4) dairy and meat, (5) breads and grains, and (6) smart shopping. An intervention video, developed for the study, was inserted into the 60 min class. In the video, a fictitious EFNEP class was observed dealing with the home food and eating issues covered in each class session. The video class members discussed problems food and feeding their family members, and modeled the use of problem solving and goal setting to overcome those problems. At the end of the class, clients received preprinted weekly goal sheets with the assigned goals for the week (Table 1), and used a problem solving mnemonic (TALK) to discuss potential barriers to achieving their goals. The letters represented "Think of the solutions," "Ask others for help," "Look at tall the ideas," and "Keep the ones that might work for you and try them out." The discussion led to solutions to overcome the barriers that the participants believed would interfere with goal attainment. Participants were asked to monitor goal attainment using the goal sheet and to return the goal sheet in class the following week. At the beginning of each class, there was a brief discussion about the previous week's goal success; problems meeting goals were identified and class participants shared solutions. The goal sheets were collected. Only intervention condition participants took part in goal setting and problem solving.

Measurements

Goal attainment. Goal attainment was recorded from the goal sheets returned by the participants each week. Research staff coded "yes" or "no" for each goal attained, as recorded by the participant. The average percentage of goals attained (%goals attained) was obtained by dividing the total number of goals attained by the total number of goals for each class, and then averaged across all classes.

Diet. One 24-h dietary food record was completed with the standard EFNEP class protocol at each data collection class. These records were entered into Nutrition Data System for Research (version 2007; Nutrition Coordinating Center, University of Minnesota) for analysis. Daily consumption of total energy, percent of energy from fat and saturated fat, fiber, servings of fruit, juice and regular vegetables (non-fried), and ounces of milk (whole, 2% and low fat/fat free), sweetened beverages and water were obtained. These dietary variables are related to the content of the 6 sessions and the participant goals.

Parental influences. The questionnaires assessing parental influences were evaluated for construct validity in previous research using exploratory factor analysis (Cullen et al., 2000; Cullen, Klesges, et al., 2004). Concurrent validity was established with correlational analyses with related constructs and behaviors (Cullen et al., 2000; Cullen, Klesges, et al., 2004). Parent self-