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Long-term maintenance of exercise and healthy eating behaviors in overweight adults

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Abstract

Background. Most people experience weight regain following the termination of a weight management program. The failure to maintain changes in diet and exercise patterns is a major factor. This study presents 24-month outcomes of a healthy-lifestyle weight management program designed to promote long-term changes in diet and exercise behaviors.

Methods. Overweight and obese adults (n = 144; BMI = 32.5 ± 3.8) completed a 6-month clinic-based weight management program and were followed for an additional 18 months. Assessments completed at baseline, 6, 12, and 24 months included weight, body composition, dietary recalls, self-reported physical activity, and mediator variables based on Transtheoretical Model of Health Behavior Change.

Results. At 24 months, subjects maintained decreases in weight, % body fat, caloric intake, % kcal saturated fat, and increases in weekly exercise minutes ($P < 0.05$). Individuals who maintained regular exercise at 24 months had higher confidence scores and higher use of experiential and behavioral processes. Individuals who maintained a healthy diet at 24 months had lower temptation scores and higher use of experiential and behavioral processes.

Conclusions. A healthy-lifestyle weight management program is successful at promoting long-term changes in exercise and dietary behaviors. Individuals who actively engage in the maintenance process are more likely to succeed.

Keywords: Obesity; Physical activity; Weight management

Introduction

The prevalence of overweight and obesity in the United States has been increasing at an alarming rate over the past 40 years [1]. As a result, weight control efforts are common [2]. In one population study, approximately 47% of men and 75% of women reported a history of dieting to lose weight at some time during their life, 6% of men and 31% of women reported having participated in a formal weight loss program, and 13% of men and 26% of women reported they were currently dieting to lose weight [3]. Obese adults participating in formal programs rarely achieve a body mass between 18.5 and 24.9 kg/m^2 because they either do not lose enough weight or the weight loss is regained after program completion. However, weight losses of 5–10% of initial body weight can confer health improvements such as reductions in blood pressure, blood glucose, and hyperlipidemia [4]. Thus, when the focus is overall health, achieving and maintaining a 5–10% weight loss should be considered successful, although for many obese individuals, this weight loss does not return them to a nonobese state.

Although many programs have been successful in helping people lose 5–10% of body weight, most people experience significant weight regain in the first year following termination of a weight loss program with complete or almost complete regain within 5 years [5]. Behavioral, environmental, and physiological factors con-

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tribute to the inability to maintain weight loss; however, failure to maintain changes in diet and exercise patterns appears to be a major factor. Nevertheless, some individuals are successful in losing weight and maintaining the loss for long periods of time. Successful maintainers in the National Weight Control Registry (NWCR) maintained a loss of 30 kg for an average of 5.5 years [6]. Although the approaches to weight loss differed widely among subjects, three strategies that were common to a large proportion of NWCR participants were (1) eating a diet low in fat (<25% kcal from fat), (2) frequent self-monitoring of body weight and food intake, and (3) engaging in high levels of physical activity (72% expend more than 2000 kcal on physical activity per week) [6]. However, these levels of dietary and exercise behavior may be difficult for the majority of the population to accomplish.

Since long-term behavior change is necessary for weight loss maintenance, extended therapy must be considered. In a review, Perri and Corsica [7] found that continuing treatment beyond 6 months improves the maintenance of weight loss. However, attending clinic-based extended care therapy may become a burden. Session attendance decreases as treatment duration approaches 1 year and participants often begin to regain weight [7]. Therefore, creativity is necessary in designing long-term treatments that are user-friendly, inexpensive, and effective in promoting weight loss maintenance.

One theoretical framework, the Transtheoretical Model of Health Behavior Change (TTM), has been successful in changing behaviors associated with obesity. Specifically, it has been used with dietary fat reduction [8–11], increasing fruit and vegetable intake [12], and increasing exercise [13,14]. Interventions that use the TTM have been delivered using a number of venues including clinic-based programs [15,16], mailed interventions [17–19], and internet or computer-based delivery [20].

The central organizing construct of the TTM is stage of change, which defines the temporal dimensions of the model (when people change) as well as where people are in the change process. Using this model, individuals can be classified into one of five stages of change for exercise and for diet: (1) precontemplation—no intention of changing to the goal behavior in the foreseeable future (operationally defined as the next 6 months), (2) contemplation—intends to reach the goal behavior in the foreseeable (within the next 6 months) future, (3) preparation—intends to reach the goal behavior in the immediate future (within the next 30 days) and generally has taken behavioral steps toward the goal, (4) action—has recently achieved the goal behavior (less than 6 months), and (5) maintenance—has achieved and continued the goal for at least 6 months. The TTM postulates that stage progression is mediated by use of decisional balance, processes of change, and self-efficacy/temptations. Decisional balance involves the individuals perceptions of the pros and cons of changing behavior; temptations or situational self-efficacy involves the individuals confidence in engaging in a healthy behavior during adverse conditions (or perceived temptations to engage in an unhealthy behavior), and the processes of change are the specific experiential and behavioral strategies that promote change in motivation and/or behavior to help the person advance through the stages of change.

There is a need to investigate mediating factors related to maintenance of healthy diet and exercise behaviors in overweight persons as those behaviors are related to successful weight loss. The current study presents 2-year outcomes of a healthy-lifestyle weight management program, consistent with NIH clinical guidelines [21], designed to promote long-term changes in diet and exercise behaviors. The goals of the program were to increase physical activity, decrease dietary fat intake, increase fruit and vegetable intake, and achieve a moderate weight loss and to maintain these changes following program completion. The purposes of the study were (1) to describe the long-term efficacy of a TTM-based healthy weight management program, (2) to determine if additional feedback on TTM variables improves maintenance of diet and exercise behaviors, and (3) to determine if TTM mediator variables differentiated between successful maintainers of the behaviors and those either failing to change or changing but relapsing.

Methods

Subjects

Men and women over the age of 18 with a BMI between 27 and 40 kg/m^2 volunteered to participate in this study. Prior to participation, subjects received written clearance from their primary care physician and provided written informed consent according to the institutional review board at the University of Rhode Island. Subjects completed a medical history questionnaire, binge-eating questionnaire, and the Beck Depression Inventory. Subjects were excluded if exercise or dietary fat reduction was contraindicated for medical reasons, if they had active cancer or type 1 diabetes, or if they reported symptoms of an eating disorder or depression. In addition, subjects underwent a symptom-limited exercise treadmill test to rule out the presence of significant cardiovascular disease.

Subjects were assessed at baseline, after the intensive portion of the clinical program (3 months), after completion of the clinical program (6 months), and during follow-up (12 and 24 months). This paper reports on the outcome of the clinical program (baseline, 6 months) and the post-clinical follow-up period (12 and 24 months).

Clinical program

All subjects completed a 6-month clinical weight management program. The multidisciplinary program, delivered to groups of 11–15 participants, focused on