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Research report

Does the type of weight loss diet affect who participates in a behavioral weight loss intervention? A comparison of participants for a plant-based diet versus a standard diet trial ☆

Gabrielle M. Turner-McGrievy [a,*], Charis R. Davidson [a], Sara Wilcox [b]

[a] Department of Health Promotion, Education, and Behavior, Arnold School of Public Health, University of South Carolina, 915 Greene Street, Room 529, Columbia, SC 29208, USA
[b] Department of Exercise Science, Arnold School of Public Health, University of South Carolina, Public Health Research Center, 921 Assembly St., Columbia, SC 29208, USA

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ABSTRACT

Studies have found that people following plant-based eating styles, such as vegan or vegetarian diets, often have different demographic characteristics, eating styles, and physical activity (PA) levels than individuals following an omnivorous dietary pattern. There has been no research examining if there are differences in these characteristics among people who are willing to participate in a weight loss intervention using plant-based dietary approaches as compared to a standard reduced calorie approach, which does not exclude food groups. The present study compared baseline characteristics (demographics, dietary intake, eating behaviors (Eating Behavior Inventory), and PA (Paffenbarger Physical Activity Questionnaire)) of participants enrolling in two different 6-month behavioral weight loss studies: the mobile Pounds Off Digitally (mPOD) study, which used a standard reduced calorie dietary approach and the New Dietary Interventions to Enhance the Treatments for weight loss (New DIETs) study, which randomized participants to follow one of five different dietary approaches (vegan, vegetarian, pesco-vegetarian, semi-vegetarian, or omnivorous diets). There were no differences in baseline demographics with the exception of New DIETs participants being older (48.5 ± 8.3 years versus 42.9 ± 11.2, $P = 0.001$) and having a higher Body Mass Index (BMI, 35.2 ± 5.3 kg/m^2 versus 32.6 ± 4.7 kg/m^2, $P = 0.001$) than mPOD participants. In age- and BMI-adjusted models, there were no differences in EBI scores or in any dietary variables, with the exception of vitamin C (85.6 ± 5.9 mg/d mPOD versus 63.4 ± 7.4 mg/d New DIETs, $P = 0.02$). New DIETs participants reported higher levels of intentional PA/day (180.0 ± 18.1 kcal/d) than mPOD participants (108.8 ± 14.4 kcal/d, $P = 0.003$), which may have been the result of New DIETs study recommendations to avoid increasing or decreasing PA during the study. The findings of this study demonstrate that using plant-based dietary approaches for weight loss intervention studies does not lead to a population which is significantly different from who enrolls in a standard, behavioral weight loss study using a reduced calorie dietary approach.

Introduction

People following plant-based dietary approaches, particularly vegan or vegetarian diets, have lower risks of some forms of cancer (Key, Appleby, Spencer, Travis, Allen, et al., 2009; Key, Appleby, Spencer, Travis, Roddam, et al., 2009) and lower body weights (Spencer, Appleby, Davey, & Key, 2003) than omnivores. Vegan and vegetarian diets have been used effectively for weight loss (Barnard, Scialli, Turner-McGrievy, Lanou, & Glass, 2005; Ornish et al., 1998) and maintenance (Turner-McGrievy, Barnard, & Scialli, 2007) and slowing the progression of early stage prostate cancer (Ornish et al., 2005). The Adventist Health Study-2, a longitudinal cohort study which follows participants adhering to different plant-based eating styles, has found differences in demographic characteristics between vegan and vegetarian participants and omnivore participants, such as a higher percentage of black and female participants who are omnivore compared to vegan or vegetarian and higher Body Mass Index (BMI) among omnivore participants (Tonstad, Butler, Yan, & Fraser, 2009; Tonstad et al., 2011).

An individual's motivation to follow a certain diet can vary by the type of dietary pattern. For example, people choosing to follow

Abbreviations: TBP, theory-based podcast; mPOD, mobile Pounds Off Digitally study; New DIETs, New Dietary Interventions to Enhance the Treatments for Weight Loss study; EBI, Eating Behaviors Inventory; PA, physical activity.

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* Corresponding author.
E-mail addresses: brie@sc.edu (G.M. Turner-McGrievy), davidsoc@email.sc.edu (C.R. Davidson), wilcoxs@mailbox.sc.edu (S. Wilcox).

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vegetarian or vegan diets may do so for health-related or ethical reasons (Hoffman, Stallings, Bessinger, & Brooks, 2013). Those following a vegetarian diet may have more positive attitudes towards health and social relationships (Hoek, Luning, Stafleu, & de Graaf, 2004) and may have healthier eating habits than semi-vegetarians (those who limit meat intake) and omnivores (Timko, Hormes, & Chubski, 2012). Motivation can also change over time for people following vegetarian diets, such as adopting the diet for health reasons but later becoming motivated to continue adherence to the diet for environmental reasons (Fox & Ward, 2008). In nutrition research, not all examined diets are self-selected by participants. For both nutrition and weight loss intervention research, diets are often randomly assigned to study participants, meaning participants must enter the study willing to receive any of the possible dietary choices offered. Motivation to participate in research studies can be influenced by many factors, such as perceived risk of the intervention and financial incentives (Bentley & Thacker, 2004). In weight loss interventions, participants are often motivated to participate in research because of a desire to lose weight and often have unrealistically high weight loss goals (Linde, Jeffery, Finch, Ng, & Rothman, 2004).

Because psychosocial, demographic, and dietary characteristics can differ by the type of dietary approach people follow, it is possible that there may be differences in these characteristics among people who choose to join dietary research studies based on the dietary approaches used in the studies. It may be assumed that people who are willing to enroll in a study which could randomize them to a vegan or vegetarian diet may already have different dietary patterns, eating behaviors, and general demographic characteristics than those individuals enrolling in a study where they will receive a diet which is inclusive of all food groups. If this is true, then it would be difficult to compare results across different weight loss studies using different dietary approaches and limits the generalizability of the findings to specific populations. The goal of this paper is to examine the baseline characteristics of two behavioral weight loss studies using a variety of different dietary approaches: standard calorie controlled approach or plant-based dietary approaches. Therefore, the research question examined in this paper is: Do the demographic characteristics, dietary intake, eating behaviors, and physical activity levels of participants who are willing to be randomized to a vegan or vegetarian diet differ from participants who know they will receive a standard, calorie-controlled approach which does not include any restrictions on food groups?

Materials and methods

The present analysis used data from two different randomized, controlled, behavioral weight loss interventions. The mobile Pounds Off Digitally (mPOD) study was a six-month randomized weight loss trial among overweight adults, which compared a theory-based podcast (TBP) (guided by Social Cognitive Theory) to the TBP plus self-monitoring of diet and physical activity (PA) using a mobile app and social support delivered via the social network Twitter (TBP + mobile) (Turner-McGrievy & Tate, 2011). The dietary approach was the same for both the TBP and the TBP + mobile groups and recommended that participants reduce energy intake by 500–1000 kcal/day and increase energy expenditure through regular PA. Participants met only three times for weight assessments (baseline, three months, and six months) and received the entire intervention through remote means. Participants had to own an internet capable mobile device, such as an iPhone or Android phone, to participate. The mPOD intervention was conducted between 2010 and 2011 in Chapel Hill, NC with baseline data collected in August 2010.

The second study was the New Dietary Interventions to Enhance the Treatments for Weight Loss (New DIETs) study. New DIETs was a two month weight loss intervention with an optional four month follow-up period. Participants who enrolled in the New DIETs study agreed to be randomized to one of five different dietary approaches for weight loss: a vegan diet (exclude all animal products), vegetarian diet (excludes all meat and seafood), pesco-vegetarian diet (excludes meat except seafood), semi-vegetarian diet (limits meat), or omnivorous diet (no foods excluded). All diets focused on low-glycemic index (GI) (Jenkins et al., 1981; Ludwig & Eckel, 2002) and low-fat foods. Participants met weekly with their assigned diet group for eight weeks and then monthly for 4 months. Participants were required to have internet and computer access to participate in the study (to complete questionnaires). The New DIETs study was conducted in 2013 in Columbia, SC with baseline data collected in February 2013.

Participants in both studies were recruited through similar methods (university and workplace listservs and newspaper advertisements). Participants provided informed written consent and both studies were approved through a university institutional review board. Similar exclusion criteria were used in both studies, such as excluding participants who have an unstable medical status or uncontrolled thyroid condition, have a BMI outside the range of 25–49.9 kg/m^2, are smokers, are unable to attend required meeting and assessment visits, have a psychiatric illness, are in treatment for alcohol or drug dependency, have an eating disorder, are currently participating in a weight-loss program, or are pregnant, breastfeeding, or planning on becoming pregnant during the study. Participants in both studies received $20 for completion of the initial assessments (at three months for mPOD and two months for New DIETs) with mPOD also receiving $20 for completion of a six-month assessment.

Participants in both studies were informed about the dietary approaches which would be used to assist them with weight loss prior to enrolling in the study. For mPOD, participants were informed that no matter which group they were assigned to, they would receive a standard, reduced calorie dietary approach with a recommendation to increase PA. This approach would require them to follow a prescribed calorie limit, self-monitor caloric intake, and increase energy expenditure. For New DIETs, participants were informed about the five different diets which would be used as part of the study and were informed that they would not be able to select the diet to which they would be assigned. New DIETs participants were also told they would need to hold their exercise levels constant over the course of the two month intervention in order to control for the effect of PA.

Interested study participants in mPOD and New DIETs first completed an online screening questionnaire to assess eligibility. If participants qualified on the screening questionnaire, they were contacted by phone to complete remaining screening questions and schedule an orientation session. Participants attended an orientation session to learn more about the study and how to complete baseline questionnaires. For the present paper, only similar measures used in both studies are included for analysis. The following measures were collected in both studies: dietary intake (two, unannounced, 24-h dietary recalls (one weekday and one weekend day) collected using the web-based Automated Self-Administered 24-h Dietary Recall (ASA24) developed by the National Cancer Institute (Subar et al., 2010)); intentional PA (kcal/d) (Paffenbarger Physical Activity Questionnaire, a survey instrument which assesses leisure time activity in adults over the previous week) (Paffenbarger, Wing, Hyde, & Jung, 1983)); and eating behaviors that are associated with weight loss (the 26-item Eating Behaviors Inventory, EBI, which assesses both positive behaviors associated with weight loss and negative behaviors associated with weight gain (O'Neil and Rieder, 2005). The EBI scores range from 26