



Review

Potential role of meal frequency as a strategy for weight loss and health in overweight or obese adults

Michelle G. Kulovitz Ph.D.^{a,*}, Len R. Kravitz Ph.D.^b, Christine Mermier Ph.D.^b, Ann L. Gibson Ph.D.^b, Carole A. Conn Ph.D.^c, Deborah Kolkmeier M.S.^d, Chad M. Kerksick Ph.D.^b

^a Department of Kinesiology, California State University San Bernardino, San Bernardino, California, USA

^b Department of Health, Exercise, and Sports Sciences, University of New Mexico, Albuquerque, New Mexico, USA

^c Department of Individual, Family, and Community Education, University of New Mexico, Albuquerque, New Mexico, USA

^d Southwest Endocrinology Associates, Albuquerque, New Mexico, USA

ARTICLE INFO

Article history:

Received 17 April 2013

Accepted 17 August 2013

Keywords:

Obesity
Women
Meal frequency
Eating frequency
Eating occasions
Weight loss
Hypocaloric diet
Appetite

ABSTRACT

Improved dietary strategies for weight loss are necessary to decrease metabolic disease risk in overweight or obese adults. Varying meal frequency (MF; i.e., increasing or decreasing eating occasions beyond the traditional pattern of three meals daily) has been thought to have an influence on body weight regulation, hunger control, and blood markers of health. It is common practice for weight management clinicians to recommend increasing MF as a strategy for weight management and to improve metabolic parameters. However, limited research exists investigating the effect of MF during controlled hypocaloric dietary interventions. Furthermore, MF literature often speculates with regard to efficacy of MF treatments based on research using normal weight, overweight/obese, or some combination, where much diversity exists within these various populations. In this review, we suggest that normal-weight and overweight/obese populations, as well as free-living versus investigator-controlled research trials, should be studied independently. Therefore, the objective of the present review is to survey the literature to assess whether the alteration of MF influences body weight regulation, hunger control, and/or blood markers of health in overweight/obese participants undergoing a controlled hypocaloric diet to induce weight loss. Findings of this review indicate that there is uncertainty in the literature when interpreting the optimal MF for obesity treatment, where reduced MF may even show more favorable lipid profiles in obese individuals compared with increased MF. Furthermore, the simple relationship of comparing MF with body fatness or body mass index should also consider whether eating frequency is associated with other healthy factors (e.g., increased physical activity).

© 2014 Elsevier Inc. All rights reserved.

Introduction

According to a recent release of Healthy People 2020, one primary public health concern in the United States is the prevalence of overweight and obese Americans [1]. Currently, more than one-third of U.S. adults are obese, with no indication that the prevalence is decreasing [2]. It has been estimated that more than 300 000 U.S. adults die each year due to obesity-related comorbidities (15.2% of all deaths) [3].

Presently, numerous dietary strategies are believed to play a role in combating overeating and obesity (defined as body mass

index [BMI] ≥ 30 kg/m²) [4–6]. Due to the need for clinical clarification, evidence-based weight loss interventions are considered crucial for decreasing the prevalence of overweight and obese Americans.

Since the early 1960s, the idea of implementing increased dietary structure in regard to meal frequency (MF) has been debated. Currently, weight management professionals recommend dietary weight loss plans that substitute the classical eating pattern (i.e., three large meals daily) with eating smaller meals more frequently throughout the day in order to spread out daily caloric intake [7,8]. Increased MF for weight management, body weight regulation, hunger control, and metabolic disease management is supported anecdotally, but this strategy lacks evidence in the associated scientific literature. Due to the potential effect of MF to manage hunger, satiety, regulation of

Each author contributed a substantial portion in development of this review.

* Corresponding author. Tel.: +1 909 537 5360; fax: +1 909 537 7199.

E-mail address: mkulovi@unm.edu (M. G. Kulovitz).

appetite hormones, and lipemia, increasing MF has been hypothesized to effect energy intake and the favorable regulation of body weight [7,9]. Furthermore, it has been shown that those who maintain weight loss tend to eat more frequently throughout the day (three meals and two snacks) than those who tend to regain weight lost, although the research is inconclusive during active weight loss [10]. The purpose of this review is to investigate the role of MF as a dietary strategy for individuals undergoing active weight loss during controlled hypocaloric dietary interventions.

Observational research has demonstrated mixed results in free-living adults versus controlled research trials when investigating the relationship between MF and body weight. Some researchers contend that higher MF is related to a healthy weight [8,11,12]. More specifically, those consuming a greater frequency of small meals throughout the day are more likely to have a normal BMI, healthy levels of certain risk markers for disease (e.g., triglycerides [TGs], cholesterol, and glucose metabolism), and consequently, a reduced risk for developing or having a diagnosis of coronary heart disease (CHD) and/or other metabolic diseases such as obesity and type 2 diabetes [8,11,12]. Conversely, others have reported that higher frequency of ad libitum eating may lead to increased weight gain and obesity because it presents increased opportunities to eat and overeat throughout the day [13–16].

Furthermore, research investigating the role of MF in disease regulation has shown variable results when investigating glucose and insulin levels and postprandial lipid profiles. Frequent meals have been proposed to reduce the occurrence of excess caloric consumption and provide better glucose control and reduced insulin secretion [17]. Benefits of increasing MF on glucose control have been shown in overweight/obese individuals [18] and in those who have impaired glucose tolerance [19,20]; however, research with normal-weight or normoglycemic individuals are mixed.

Increasing MF in overweight or obese individuals has shown reduced glycemic load [19], improved glucose and insulin metabolism [18,19,21], and improved hunger control [9,18]. However, in healthy normal weight individuals and/or persons without impaired glucose metabolism, no significant differences were found in postprandial glucose regulation [22], in reducing the concentrations of lipids and/or hormones [23], or in feelings of hunger [24].

Current meal patterns and body weight

One of the most notable limitations in the literature examining eating patterns associated with MF is the predominance of observational, cross-sectional studies. In this regard, some studies have reported an inverse relationship between eating frequency and percentage of body fat or BMI in both normal weight and obese adults [25,26]. According to a study investigating eating patterns and prevalence of obesity in free-living U.S. adults, eating four or more times per day was associated with a lower risk for obesity compared with eating three or less times per day [26]. However, those who habitually skipped breakfast were 1.35 times more likely to be obese than those who always had breakfast [26]. Research analyzing eating patterns of U.S. adults showed that obese individuals eating ad libitum are more likely to skip breakfast, “gorge” during mid-morning or lunch, and then “gorge” again for dinner, with no snacks or meals in between [26]. Observational studies investigating eating patterns of weight-stable and weight-gaining individuals showed that weight-gaining individuals eat an average of 1645 kJ/d more

than weight-stable individuals; this difference is attributed to increased carbohydrate and fat consumption through larger portion sizes [27]. These studies provide evidence of the need for more controlled feeding studies. Findings from a 2002 study suggest that without holding total caloric intake constant, the usefulness of MF and meal-timing data can be limited [27].

Current limitations in the literature

Several limitations exist within the MF research to date, including a lack of standardized terminology and use of multiple terms when describing eating occasions, such as meal frequency, eating frequency, and feeding frequency. Furthermore, definitions of caloric requirements for a meal or snack differ [11,22,28]. Additionally, due to the differences in responses of healthy normal weight versus overweight/obese adults, comparisons should be made between similar populations rather than grouping them together. Grouping different populations may produce differing responses to MF, lipid and glucose metabolism, hormonal appetite regulation, or sensations of hunger/satiety [21,23,27,29]. Differences also occur, in part, due to varied research methodologies; limited research exists using strict dietary and/or controlled methods. Although it is important to understand the behaviors of free-living adults, controlled trials should not be compared with free-living observational studies to investigate plausible strategies to be used by clinical professionals for weight management. Moreover, due to the common error seen with individuals underreporting caloric intake, other potential differences can occur when drawing conclusions about optimal MF when using self-reported dietary intake versus portion-controlled products [30].

Therefore, the goal of this review is to clarify the effect of different MF on body composition and weight management, lipid and glucose metabolism, hunger and satiety, and hormonal appetite regulation in overweight/obese adults based on scientific evidence from randomized controlled, hypocaloric diet trials. Previous review papers investigating the effect of varied MF on these parameters have not studied the impact of MF with only overweight/obese adults undergoing a hypocaloric dietary intervention to induce weight loss [14,31–33]. Because outcome measures can vary between normal weight and overweight/obese individuals, the results of interventions with overweight/obese individuals during a hypocaloric dietary trial will be discussed in order to discern possible treatment mechanisms for obesity management. This review will investigate randomized controlled research trials using reduced-calorie controlled dietary interventions that include altering MF. We also will assess whether there is evidence to suggest that increasing MF during a reduced-calorie diet may be a treatment strategy for reducing obesity. Additionally, we will highlight areas in need of further research.

Literature search criteria

The scientific literature was reviewed and studies were incorporated in this review if they included healthy overweight or obese (BMI \geq 25 kg/m²) adults (males and/or females, ages 18–66 y), who were consuming a hypocaloric diet during a controlled feeding study. Keywords included in the search were a combination of *obese*, *hypocaloric*, *reduced calorie*, *meal*, *eating*, *frequency*, *occasion*, and *timing*. The following sources were used: MedLine, PubMed, Proquest, Cochrane Database, and Google Scholar. Studies published between 1970 and 2012 were included if they were written in the English language and

Download English Version:

<https://daneshyari.com/en/article/3276361>

Download Persian Version:

<https://daneshyari.com/article/3276361>

[Daneshyari.com](https://daneshyari.com)