



Research report

Pre-ordering lunch at work. Results of the what to eat for lunch study[☆]

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ABSTRACT

The objective of this study was to evaluate an intervention that combined mindful eating and online pre-ordering to promote healthier lunch purchases at work. The study took place at an urban hospital with 26 employees who were overweight or obese. The design included a contemporaneous comparison with delayed-treatment control and a three-phase prospective study. A minimum 4-week baseline period preceded a 4-week full-intervention, in which participants received mindful eating training, pre-ordered their lunches, and received price discounts toward lunch purchases. In a 4-week reduced intervention phase, participants pre-ordered lunches without price discounts. Participant lunch purchases were tracked electronically at the point of purchase. The primary outcome measures were the amounts of kilocalories and fat grams in purchased lunches. In contemporaneous comparisons, the treatment group purchased lunches with an average of 144.6 fewer kilocalories ($p = 0.01$) and 8.9 fewer grams of fat ($p = 0.005$) compared to controls. In multivariable longitudinal analyses, participants decreased the average number of calories in their meals by 114.6 kcal per lunch and the average grams of fat by 5.4 per lunch during the partial-intervention compared to the baseline ($p < 0.001$). At the end of the study, a moderate increase was observed in participants' overall mindful eating behaviors as compared to the beginning of the study ($p < 0.001$). The majority of participants (92%) said they would use the pre-ordering system if offered in the future. Combined mindful eating training and online pre-ordering appears a feasible and useful worksite intervention to improve food choices by employees.

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Introduction

Identifying effective strategies to improve healthier eating is both a public health priority and a clinical challenge. Nearly 70% of American adults are classified as overweight or obese (National Center for Chronic Disease Prevention and Health Promotion: Division of Population Health, 2013), placing them at increased risk for coronary heart disease, stroke, type 2 diabetes, and cancer (American Heart Association, 2013; National Institutes of Health: National Heart, Lung, and Blood Institute, 2012). Workplace wellness interventions have been identified as a vehicle for improving healthy behaviors in large groups of diverse consumers (Glanz, Sallis, Saelens, & Frank, 2005; Kolasa, Dial, Gaskins, & Currie, 2010; Lemon et al., 2009; Quintiliani, Poulsen, & Sorensen, 2010; Sorensen, Linnan, & Hunt, 2004). Nearly 140 million adults spend about one-third of the day at the worksite (National Center for Chronic Disease Prevention and Health Promotion: Division of Population Health, 2013). A majority (67%) purchase lunch at least once per week and almost 40%

purchase lunch three or more times per week (Blanck et al., 2009). Worksite cafeterias may be prime settings for interventions that target improvements in healthy eating.

Reducing the amount of daily kilocalories and fat grams consumed is essential for healthy weight loss (Lindström et al., 2006; Sacks et al., 2009), though decreasing dietary intake is known to be a substantial challenge (Fan & Jin, 2013; Glanz et al., 2005; Lillis, Hayes, Bunting, & Masuda, 2009; Tapper et al., 2009). In order to help people lose and maintain weight loss, effective interventions must address both psychological processes and key behaviors. There is evidence to suggest that obesity is associated with both *emotional eating* and *external eating* (Blair, Lewis, & Booth, 1990; Braet & Van Strien, 1997; Delahanty, Meigs, Hayden, Williamson, & Nathan, 2002; Hays et al., 2002; Tapper et al., 2009; Wardle, 1987). Emotional eating refers to a tendency to overeat in response to negative emotions such as boredom, stress, and unhappiness (Tapper et al., 2009). External eating refers to overeating in response to food-related stimuli such as the taste, sight or smell of a palatable food (Van Strien, Schippers, & Cox, 1995). Helping individuals make decisions that overcome these emotional and external eating factors is important in promoting healthier food options.

Pre-ordering meals is an emerging strategy for changing the structure in which people make their food choices and can influence the decision to opt for healthier foods. This framework, referred to as “choice architecture”, may help improve individuals’ dietary decisions based on how options are presented (Thaler & Sunstein, 2009). Interventions that change how choices are presented and facilitate decision making toward a desired outcome have shown promise in a number of domains (Johnson & Goldstein, 2003; Thaler & Benartzi, 2004). Pre-ordering programs have been created with the assumption that ordering food in advance of meal-time may mitigate hunger-based, impulsive selections and eliminate sensory cues that lead to less healthy choices (Hanks, Just, Smith, Wansink, & Dyson, 2012). An earlier commitment to a more beneficial, future outcome (such as weight loss) can prevent someone from succumbing to a temptation in the immediate environment (such as unhealthy lunch choices) (Rachlin, 2009).

Precommitment is about acting in the present to make a better future. It relates to the decisions about *what* one chooses to eat. In this way, pre-ordering may act as a device to help regulate self-control (Hanks et al., 2012; Schelling, 2007). Additionally, pre-ordering programs can help individuals alter their typical food choices towards more healthy alternatives. Individuals tend to stay with a typical or default option (Blumenthal & Volpp, 2010; Loewenstein, Brennan, & Volpp, 2007; Volpp et al., 2006) and are less apt to specify alternatives to their usual choices (Kamenica, 2012; Madrian & Shea, 2001; Thaler & Mullainathan, 2008). Pre-ordering systems can be designed specifically to make the default option the healthiest of the choices. For example, the default option may be the lowest calorie choice, whereby alternative choices may contain added sauces or toppings. Similar to menu labeling initiatives (Berman & Lavizzo-Mourey, 2008; Nestle, 2010; Pomeranz & Brownell, 2008; Stein, 2010), pre-ordering programs also have the potential to serve as a vehicle to provide calorie and other nutritional information in foods.

Permanently improving eating habits also requires that an individual exerts effort to alter the way he or she would normally think, feel, or behave with respect to food (Muraven & Baumeister, 2000). That is, to promote healthy eating, a person must be aware and make intentional choices with respect to their eating practices. “Mindfulness” involves “paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally” (Kabat-Zinn, 1994). The technique encourages individuals to be cognizant of internal processes which occur from moment to moment and to be present-focused (Albers, 2011; Wansink, 2010; Weil, 1999). Mindfulness emphasizes awareness related to *how* one eats. Emerging

evidence has shown such techniques may foster improved eating habits (Kristeller, Baer, & Quillian-Wolever, 2006; Kristeller & Hallett, 1999; Smith, Shelley, Leahigh, & Vanleit, 2006).

The main objective of this pilot study was to assess the feasibility and utility of implementing a large-scale worksite program to promote healthier eating. We used a combined intervention that consisted of: education and training around mindful eating, an online pre-ordering lunch system that provided calorie and fat information, and use of financial incentives in the form of discounts to promote study participation. We hypothesized that pre-ordering may help improve decisions about *what* people chose to eat for lunch and that mindfulness training may help improve *how* people approach eating their lunch. We worked with the study hospital’s food service provider (Aramark, Inc) to develop the online system for pre-ordering lunches.

The primary outcomes were the number of kilocalories (kcal) and fat (grams) in lunches purchased by participants. The pre-specified hypotheses were that participants receiving the full intervention would purchase lunches with fewer kilocalories and fat grams than a delayed-treatment group (serving as controls). In comparisons over time, we expected that the number of kilocalories and grams of fat in daily purchased lunches would decrease from baseline to each of the full-intervention and partial-intervention phases.

The study was approved by the Institutional Review Board of the Einstein Healthcare Network.

Materials and methods

The study was conducted at a large urban hospital in Philadelphia, Pennsylvania. The design incorporated a contemporaneous comparison of the two study groups and a 3-phase prospective cohort study. The targeted population was overweight and obese employees.

Subjects

Thirty-one adult employees who worked full-time at the study hospital and who had a Body Mass Index (BMI) of at least 25.0 were recruited and assessed for study eligibility, after which 28 were randomized. Recruitment methods included: emailed institutional newsletters, information posted on the institution’s health and wellness website and at time clocks throughout the institution. Hard copies of study information were sent to department directors of Maintenance and Housekeeping – whose employees were known to be low users of the institutional email. Individuals were screened in-person for eligibility at the research office. Inclusion criteria were: having a BMI of at least 25.0; in addition, they needed to eat at least three lunches a week in the hospital cafeteria, be willing to allow researchers to collect data about their lunch purchases, and have access to a computer at work. Exclusion criteria were: diagnosis of unstable hypertension, dyslipidemia, or coronary artery disease whose medical therapy had changed in the past three months, plans to terminate hospital employment within four months following study enrollment, or being pregnant. If eligible, written informed consent was obtained. Consenting participants then completed a brief self-report survey that addressed basic sociodemographics, global health status, physical activity, and goals for study participation.

We randomly assigned 28 participants to one of two groups (“treatment” or “delayed-treatment”) using a computer program. Three additional employees entered the study post-randomization. Given their later entry, all were assigned to the delayed-treatment. Prior to the start of the full-intervention, five employees withdrew; three informed the research manager that they were unable to continue due to reasons unrelated to the study and two no longer

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