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Effectiveness of a Worksite-based Weight Loss Randomized Controlled Trial: The WORKSITE Study

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Abstract

Objective—To determine the effectiveness of an individually-targeted Internet-based intervention with monetary incentives (INCENT) at reducing weight of overweight and obese employees when compared to a less-intensive intervention (Livin' My Weigh [LMW]) 6-months after program initiation.

Design and Methods—Twenty-eight worksites were randomly assigned to either INCENT or LMW conditions. Both programs used evidence-based strategies to support weight loss. INCENT was delivered via daily e-mails over 12 months while LMW was delivered quarterly via both newsletters and onsite educational sessions. Generalized linear mixed models were conducted for weight change from baseline to 6-month post program and using an intention-to-treat (ITT) analysis to include all participants with baseline weight measurements.

Results—Across 28 worksites, 1,790 employees (*M*=47 years of age; 79% Caucasian; 74% women) participated. Participants lost an average of 2.27 lbs ($p<0.001$) with a BMI decrease of 0.36 kg/m^2 ($p<0.001$) and 1.30 lbs ($p<0.01$) and a BMI decrease of 0.20 kg/m^2 ($p<0.01$) in INCENT and LMW, respectively. The difference between INCENT and LMW group in weight loss and BMI reduction were not statistically significant.

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Conflicts of Interest

Competing interests: The authors have no competing interests.

Conclusion—The current study suggests that INCENT and a minimal intervention alternative may be effective approaches to help decrease the overall obesity burden within worksites.

Keywords

Obesity; Worksite; E-mail; Behavioral Intervention; Incentives

Introduction

A marked increase in body mass index (BMI) has occurred across all racial, ethnic, gender, and age groups worldwide in the last three decades.[1] Given the negative consequences of overweight and obesity, the current prevalence of these conditions is alarming. In order to address the growing obesity epidemic, worksite-based health promotion programs have been recommended due to their potential reach and social support impact.[2,3] Within worksite contexts, many strategies to prevent and treat obesity have been studied. These have included mostly educational programs delivered in person or to small groups that focus on knowledge acquisition strategies targeted at individuals to improve their dietary and physical activity practices.[4] These programs have been criticized because they typically reach a small percentage of workers[5], are of short duration, and have generally small effects that are not sustained.[6,7] Additionally, most of these programs have generally been conducted in large worksites[4,8] making generalizations regarding their benefit across worksite settings limited.[4,9]

To overcome these limitations[5–9] the goal of the Tailored Worksite Weight Control Programs project was to determine the reach and effectiveness of an intervention that: a) is based on theory, b) is delivered through interactive technologies, and c) is designed to apply to both small and medium worksites. More specifically, using a comparative effectiveness design[10] we tested the utility of an individually-targeted Internet-based intervention with monetary incentives (INCENT) to reduce the weight of overweight and obese employees when compared to a less-intensive minimal intervention (Livin' My Weigh) that included newsletters and onsite educational sessions delivered on a quarterly basis. The purpose of the current article is to report on the initial (6-month) effectiveness of the INCENT program as compared to the Livin' My Weigh (LMW) program. It was hypothesized that the INCENT program would have greater improvements in weight loss and secondary health behavior (e.g. physical activity – PA, and dietary behaviors) outcomes at 6 months compared to the LMW program.

Methods and Procedures

Design Overview

A two-arm cluster randomized controlled trial was used to assign 28 worksites to one of the following 2 conditions: (1) INCENT or (2) Livin' My Weigh. Randomization took place after an initial brief health survey (BHS) was completed by worksite employees regardless of weight status. Randomization was stratified based on worksite size (100–300 and 301–600 employees). As worksites completed the BHS, they were assigned to one of the two conditions using a randomization table. The BHS and its application have been fully

described elsewhere.[11] This study and protocol were approved by the Virginia Tech Institutional Review Board (protocol #07-296) and is registered at clinicaltrials.gov (NCT01880060).

Worksite Recruitment

To be eligible worksites had to: a) provide Internet access to employees, b) have between 100 and 600 employees, c) have employees physically located in one site with access a kiosk for weigh-ins, and d) agree to conduct a BHS of the entire employee population. Recruitment began in August of 2007 in Roanoke and Richmond, Virginia. Worksites were identified through a variety of approaches and has been fully described elsewhere.[12]

Participant Recruitment

Participants had to be adults (≤ 18 years old), have a BMI greater than or equal to 25 kg/m^2, not currently pregnant or pregnant in the last 12 months, not currently participating in a weight loss program (e.g. Weight Watchers), free of serious medical conditions (e.g. terminal cancer, recent heart attack), be employed by one of the participating worksites, and have access to the Internet at their work location.

Recruitment began in February of 2008 after initial randomization, with 45-minute kick-off presentations scheduled throughout the day. During kick-off presentations, trained research staff described the program (i.e., INCENT or Livin' My Weigh) as well as all research requirements. For both programs, interested employees had three weeks to complete a 4-step enrollment process: the informed consent, online program registration, initial weigh-in at an on-site Kiosk (The Health Spot™), and the study survey.

Of the 8,710 employees across the 28 worksites, 6,258 employees were projected to be eligible to participate based on the BHS results.[11] A total of 1,790 employees enrolled in the study. Participants were on average 47 years old with the majority being Caucasian (79%) and women (74%). A comparison of eligible employees showed that women (74% of participants vs 54% of nonparticipants) and caucasian employees (79% of participants vs 73% of nonparticipants) were more likely to participate ($p<.05$). Furthermore, INCENT sites had higher participation rates (37% vs. 27%, $p<.0001$) than their LMW counterparts. There were no consistent patterns of participation based on income or employment. Full baseline characteristics are shown in Table 1.

Interventions

INCENT Program—The INCENT program was developed to support weight loss via the promotion of a healthful diet (e.g. low fat, high fiber, emphasis on fruits and vegetables, choose water instead of sugary drinks)[13] and regular physical activity (e.g. 150 minutes of PA/week) [14]. The program was informed by research findings[15,16] and designed to be convenient (e.g,. no group meetings) and attractive to employees (e.g., get paid to lose weight). It used strategies based on social cognitive theory[17] to help initiate weight loss over four quarters, where the initial 6 months of the program focused on weight loss strategies, and the final 6 months focused on relapse prevention and maintenance strategies. Daily e-mails were the active delivery channel of behavioral strategies. These e-mails were tailored

to each participant based on gender (male/female), fitness program choice (foundation/intermediate/advanced) and location (home/gym), and barriers selected during the enrollment process. Seven different e-mail formats were used across the entire program (see Table 2).

Furthermore, the INCENT program sought to enhance recruitment, engagement and retention via a stepped process in the provision of monetary incentives. The monetary incentive was developed to improve recruitment by enhancing participants' perceptions of positive outcomes related to weight loss[18,19]. The incentives were based on the percent of weight loss (e.g. 1% weight loss = $1.00, 2% weight loss = $2.00) through participants' quarterly weigh-ins at a Health Spot™, which included a calibrated scale and a built in digital camera (See Figure 2). The rationale underlying the incentive timing and amount was threefold. First, the amount of incentive ($1/percent body weight lost/month) was selected to avoid the use of unhealthy eating or activity patterns that may be used to lose weight quickly[20]. Second, by including only a modest incentive the likelihood of inhibiting intrinsic motivation would be low[21]. Third, the incentive scheme of $1 per percent weight lost per month is easily communicated to, and understood by, participants.

Finally, the INCENT program had a comprehensive website that served as an electronic support system. The website included video explanations of exercises, links to recipes, discussion forums, and links to an electronic fitness advisor. Key features of the website also included photos from the weigh-ins, information on weight lost, and self-monitoring logs for PA and dietary intake.

Livin' My Weigh (LMW) Program—A comparison group is essential for a comparative effectiveness research study. After meetings with business leaders, it was determined that for businesses to agree to participate in a randomized controlled trial, they needed to receive a minimum amount of intervention[22] to encourage employees to participate. As such, we developed a minimal intervention-comparison condition, LMW, with the objective of providing information on healthy eating and PA, that if followed would result in weight loss.

The LMW program utilized condensed versions of informational materials from the INCENT program, but did not include incentives or any of the strategies conceptualized to be active intervention ingredients (e.g. intervention tailoring, daily e-mails, regular access to kiosk station and website). Four newsletters delivered at the beginning of each quarter provided information on different exercise programs (foundation/intermediate/advanced) as well as a description of the eating plan and meal ideas. Additionally, four group resource sessions were delivered quarterly. All resource sessions took place at the worksite location and lasted about 1 hour. These resource sessions included: 1) being healthy at any size, 2) nutritional decisions and health, 3) eating healthfully on a budget, and 4) resistance-band strength training session.

Measures

All measures, with the exception of body weight and BMI, were self-reported and completed via either web-based or paper-and-pencil format. The primary outcome measure, body weight, was assessed using the calibrated scale available at the Health Spot™. Additionally,

we calculated a dichotomous variable for achieving clinically significant (5%) weight loss. Secondary outcomes of interest included PA and dietary behaviors. During the 6-month assessment period, participants had 4 weeks to complete their weigh-in and surveys. Three weeks prior to the 6-month assessment an e-mail with a link to the online survey was sent (paper version was available upon request). Those participants not completing their 6-month assessment received follow-up e-mails, phone calls, and visits to the worksite. Finally, participants were entered into a $250.00 cash drawing (1 prize for each worksite).

PA Behaviors—A combination of the rapid assessment physical activity scale (RAPA)[23] and the behavioral risk factor surveillance survey (BRFSS)[24] questions were selected to assess participant PA. The RAPA[23] involves 8 yes/no items assessing the type and amount of PA ranging from light to strenuous intensity. Six questions assessing the number of days and minutes of light, moderate, and vigorous PA from the BRFSS were used to calculate the total weekly minutes. Finally, participants reported the number of days and time spent in strength training activities. A dichotomous variable for meeting current PA guidelines[14] was also calculated.

Dietary Behaviors—The Block Dietary Fat Screener, and the Block Fruit-Vegetable-Fiber Screener[25] were selected as brief assessment tools. The Fat Screener is a self-administered one-page screener which includes 17 items, and provides information on usual intake of total fat (grams), saturated fat (grams), and dietary cholesterol (grams). The Fruit-Vegetable-Fiber Screener is a self-administered 10-item survey, which provides information on usual intake of fruits and vegetables (servings/day), and dietary fiber (grams). Additionally, we calculated two dichotomous variables (meet 5-a-day fruit and vegetable intake recommendation, meet less than 30% fat intake recommendation) for dietary behaviors. Furthermore, we selected the Beverage Intake Questionnaire (BEVQ)[26] to assess overall beverage intake. The BEVQ estimates habitual mean daily intake of water, sugar-sweetened beverages (SSB) and total beverages (kcals, fl. oz.) across 19 beverage categories.

Data Analysis—We present summary statistics at the worksite level in Table 1. Following the recommended procedure for clustered randomized control trials analysis[27], we conducted individual level outcome analysis and controlled individual characteristics as covariates (see Table 3). These covariates were chosen a priori according to their likelihood of influencing the outcomes of interest. Additionally, variables with significant differences between groups (see Table 1) were also included in the model as covariates. Clustering was accounted for using generalized linear mixed models with the baseline covariates controlled and the models also including a time indicator, an INCENT group indicator, and an interaction term for group by time. The coefficient associated with the interaction term is the short-term treatment effect between groups.

We used intention-to-treat (ITT) analysis to keep all participants with non-missing baseline outcome measurements. For those participants with missing 6-month outcome measurements (11.7%) we replaced the missing 6-month data with their baseline value following the Last Observation Carried Forward approach (completers only analysis and multiple imputations with attrition probability found the same results). As shown in Figure

1, one worksite in LMW group dropped out before 6-month assessment. Therefore, we did not include this worksite in the analysis (a total of 54 participants were dropped). Furthermore, we dropped 65 individuals from the analysis due to job loss and medical reasons. We performed sensitivity analysis with and without those participants and our conclusions did not change.

Furthermore, for the dichotomous outcome measures, we treated those models as linear probability models in order to retain the straight-forward treatment effect interpretation of the results by applying generalized linear models in the analysis. Means and standard deviations for all primary and secondary outcomes at both baseline and 6-month are also presented. All statistical analyses were conducted in Stata v12.1 and the 5% significance level was used.

Results

Enrollment and Retention Rates

Figure 1 presents study enrollment and retention at 6-months. The adoption rates of eligible worksites are reported elsewhere [12], but briefly, a total of 119 worksites were identified with 73 eligible sites. Of those, 39 worksites enrolled in the program (53.4% enrollment rate). Twenty-eight worksites were randomized (38.3% participation rate) to either INCENT (n=14) or LMW (n=14) with 1790 employees (32% of potentially eligible employees) enrolling in the study (INCENT=1001 participants, LMW=789). There were no differences in worksite adoption rate based on size or type of worksite.[12] Measurements were obtained from 88% of the sample at 6 months, with no significant retention differences between LMW (86%) and INCENT (90%) (Figure 1).

Baseline Data

Table 1 presents the means and standard deviations of baseline variables at worksite level by group. INCENT group participants were younger (45.7 vs. 48.2), had shorter tenure length (8.12 yrs. vs. 11.56 yrs), had fewer participants who worked in management (11% vs. 17%), and indicated lower levels of comfort with Internet (3.3 vs. 3.5).

Primary Outcome Results

Table 3 reports the baseline and 6-month outcome summary statistics. Participants in the INCENT group on average lost 2.27 lbs ($p<0.001$, *Cohen's* $f^2: .00078$) and had a BMI decrease of 0.36 kg/m^2 ($p<0.001$, $f^2: .00087$) while participants in LMW group lost 1.30 lbs ($p<0.05$, $f^2: .00027$) and decreased BMI by 0.20 kg/m^2 ($p<0.05$, $f^2: .000298$). However, the differences between INCENT and LMW group in weight loss (−0.97 lbs, $p=0.183$, $f^2: .00004$) and BMI reduction (−0.16, $p=0.188$, $f^2: .00004$) were not significant. Additionally, results show positive time effect for both INCENT and LMW groups (14.56% vs. 9.67%, both with $p<0.001$, $f^2: .0878$ *and* $.0561$) in achieving 5% weight loss. However, no treatment effect was found (4.89% difference, $p=0.103$, $f^2: .002762$).

Secondary Outcome Results

Participants in both groups (Table 3) showed improvement in fruit and vegetables (INCENT: 0.32, $p<0.001$, $f^2: .01318$; LMW: 0.12, $p<0.01$, $f^2: .001978$); reduction in fat intake (INCENT: − 6.05, $p<0.001$, $f^2: .02335$; LMW: −5.83, $p<0.001$, $f^2: .02431$); increases in dietary fiber intake (INCENT: 1.00, $p<0.001$, $f^2: .01517$; LMW: 0.42, $p<0.001$, $f^2: .00268$); reduction in SSB intake (INCENT: −26.42 kcal, $p<0.001$, $f^2: .00467$; LMW: −28.08 kcal, $p<0.001$, $f^2: .00452$); and increases in moderate PA behavior (INCENT: 22.55 min/week, $p<0.001$, $f^2: .01576$; LMW: 18.04 min/week, $p<0.001$, $f^2: .01060$). Among those behavioral changes, INCENT participants showed larger improvements in their fruit and vegetables (0.20 servings, $p<0.001$, $f^2: .001224$) and dietary fiber intake (0.58 gms, $p<0.001$, $f^2: .00126$). Furthermore, participants in the INCENT group showed a statistically significant increase in their average daily water consumption (1.66 floz, $p=0.01$, $f^2: .0022$), while LMW group showed no change over the 6 months (0.47 floz, $p=0.575$, $f^2: .00019$). Full results can be seen on table 3.

Discussion

We evaluated the effectiveness of an internet-based intervention with monetary incentives to reduce the weight of overweight and obese employees (INCENT) when compared to a minimal intervention newsletter and informational program (LMW). To our knowledge, this is one of the first comparative effectiveness cluster randomized controlled trials evaluating an Internet-based program and an alternative minimal intervention delivered within worksites. While the INCENT program demonstrated small reductions in weight and BMI, our hypothesis that the INCENT program would have greater reductions in weight and BMI compared to the LMW program was not confirmed. Additionally, when investigating INCENT's ability to lead to clinically significant weight loss, no difference from LMW was found, as both conditions improved on weight related outcomes. Nonetheless, both groups led to a significant percentage (14.56 and 9.67%) of participants losing at least 5% of their body weight. This is an important finding as modest weight loss (5% weight loss) has been shown to improve weight-related comorbidities and prevent the incidence of type 2 diabetes.[28]

These results are similar to recent Internet-based weight loss studies[29,30]. For instance, Morgan et al. (2013)[30] found no differences in weight loss and BMI reduction among overweight and obese men when comparing an Internet-based program to a paper-based weight loss program, while finding significant changes when comparing either group to a no-contact control group. Additionally, while recent studies[31,32] investigating environmental and policy-based worksite interventions have failed to demonstrate effectiveness in weight loss, both programs investigated in the current study were able to reduce small amounts of weight and BMI. This is a particularly important finding as it provides new evidence that Internet-based worksite interventions have the potential to help participants lose weight across a variety of worksite settings. Nevertheless, additional strategies may be needed in order to increase the magnitude of effect while still reaching a broad proportion of employees across a variety of worksite settings. Finally, these results support recent findings of the relative effectiveness of minimal intervention conditions (MINC)[22] suggesting that

more intensive interventions be compared to MINC conditions more consistently to see if the additional benefits justify the added intensity and often costs.

Our results also support recent findings demonstrating the potential of Internet-[29,30] and worksite-based[31,32] interventions to lead to behavior change and weight loss over time. Of particular note, our secondary outcomes investigations demonstrated that fruit, vegetable, fiber, and water intake all showed greater improvement for the INCENT program than LMW, while all other dietary and PA behaviors showed similar improvement for both groups. These outcomes are encouraging given the potential population level reach that Internet-based worksite interventions have.

One possibility for the lack of more robust differences between conditions may have been that the minimal intervention comparison condition was itself effective in producing significant improvement in multiple outcomes. Despite the lack of more between condition effects, we concur with advocates of comparative effectiveness[35], pragmatic clinical trials[36], and minimal intervention comparisons[22] that greater use should be made of alternative intervention designs rather than no treatment comparisons as these are the decisions that policy and decision makers need to make. Still, these findings are modest, at best, and suggest that minimal interventions lead to a small proportion of eligible employees achieving a clinically meaningful weight loss.

There are also some limitations with this trial that could be overcome with future research. Foremost, there were only a moderate number of worksites participating in the trial. Although, we approached over 70 potentially eligible worksites, many were not amenable to randomization. Most worksites wanted a guarantee that they would be in the INCENT group. As such, only the most motivated worksites fully enrolled in the study. This additional motivation from LMW sites may have impacted their overall effectiveness. This also points to an additional avenue for future research to examine the role of study design in organizational adoption rates. Nonetheless, our overall adoption rates (~38%) were similar to those reported in the literature.[37,38]

Our study included a number of strengths as well. These include, but are not limited to, a) the testing of a potentially highly generalizable intervention (INCENT) that combined key elements found to be efficacious in previous research[14]; b) the use of a cluster randomized controlled design and appropriate analyses; c) the pragmatic design combined with a comparative effectiveness design with the use of a minimal intervention comparison; d) the reach of over 30% of potentially eligible employees (most studies do not report on these proportions)[4] and e) the enrollment of small and medium-sized worksites representing a variety of worksite types (both blue-color and white-collar worksites).

In conclusion, this study demonstrates that an individually-targeted Internet-based and a minimal intervention can both lead to improvements in PA and dietary behaviors within a worksite setting. More importantly, both approaches investigated were successful in helping participants lose small amounts of weight and decrease their BMI. Future research from this trial should investigate whether these intervention effects remain consistent at the end of the 12-month interventions as well as explore potential maintenance effects and incorporate the

costs associated with the programs to help determine the most cost-effective intervention. Addressing the public health challenges of obesity and its consequences within worksites will require a multitude of approaches including environmental, policy, group, and individually targeted approaches in a cost-effective manner. The current study suggests that an individually-targeted Internet-based intervention with monetary incentives and a minimal intervention alternative may also be effective approaches to help decrease the overall obesity burden within worksites.

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What is already known about this subject?

- In order to address the growing obesity epidemic, worksite-based health promotion programs have been recommended due to their potential reach and social support impact.
- These programs have included mostly educational interventions delivered in person or to small groups that focus on knowledge acquisition strategies.
- These programs have been criticized because they reach a small percentage of workers, are of short duration, and have small effects that are not sustained.

What this study adds

1. This is the first study to randomize employees to an individually-tailored, Internet-based worksite weight loss intervention with monetary incentives or a less-intensive alternative intervention.
2. This study details the short-term effectiveness of high- and low-frequency behavioral interventions for weight loss within a worksite setting.
3. Evidence-based strategies delivered online for the promotion of healthful eating and physical activity led to improvements in weight status for both the high- and low-frequency intervention conditions.

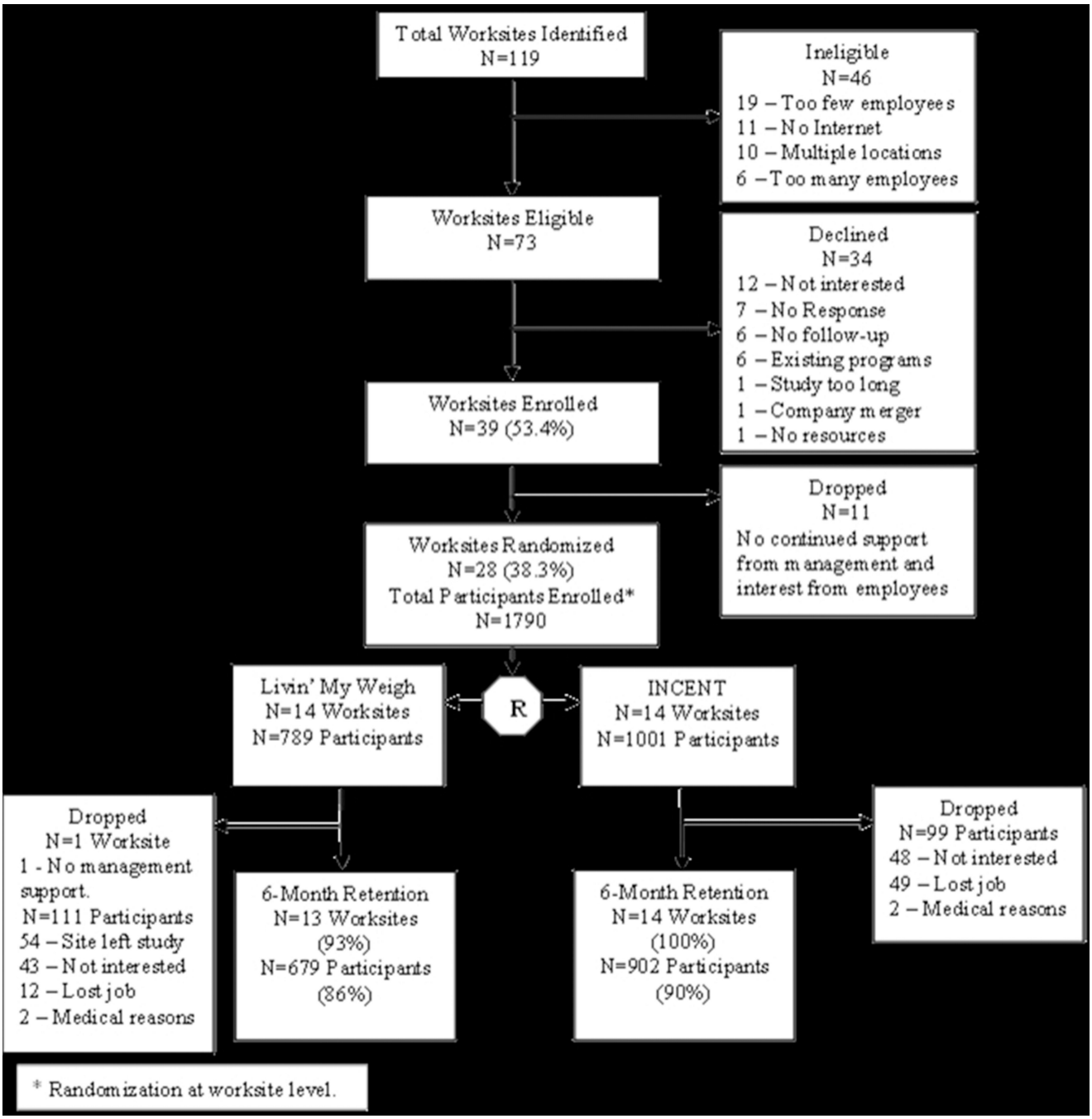

Figure 1.
Worksite and participant flow diagram

Figure 2.
The Health Spot™

Table 1

Participant baseline characteristics at worksite level by group

Variable	INCENT N=14	LMW N=14	Overall N=28	Difference
Total Number of Participants	789	1001	1790	
Demographic variables				
Age, mean (SD)	45.68(3.30)	48.24(2.78)	46.96(3.26)	−2.56*
Female,% (SD)	80.21(10.84)	67.43(25.02)	73.82(20.01)	12.78
Caucasian,% (SD)	72.66(20.60)	81.97(22.78)	77.32(21.83)	−9.31
African American,% (SD)	24.02(20.99)	14.26(22.15)	19.14(21.75)	9.76
Other race,% (SD)	3.32(2.23)	3.77(2.77)	3.55(2.48)	−0.45
Hispanic or Latino,% (SD)	2.04(2.62)	3.03(3.42)	2.54(3.03)	−0.99
Education level,% (SD)				
Less than High school	1.66(2.96)	1.96(3.40)	1.81(3.13)	−0.31
High school graduate	12.98(11.31)	16.19(14.50)	14.58(12.86)	−3.21
Some college	37.66(10.91)	29.09(12.45)	33.37(12.28)	8.57
College graduate	33.25(11.27)	33.76 (14.26)	33.50(12.62)	−0.50
Post graduate/professional	14.46(13.26)	19.00(16.00)	16.73(14.60)	−4.54
Annual household income,% (SD)				
Less than $15,000	1.10(1.71)	1.16(1.45)	1.13(1.56)	−0.06
$15,000-$29,999	13.38(10.51)	11.13(7.22)	12.25(8.92)	2.25
$30,000-$49,999	25.16(8.71)	23.93(10.39)	24.55(9.43)	1.23
$50,000-$99,999	38.59(5.19)	40.98(10.65)	39.79(8.31)	−2.38
$100,000 or more	21.77(14.36)	22.80(14.27)	22.29(14.06)	−1.03
Health literacy, mean(SD)	13.38(0.41)	13.22(0.59)	13.30(0.50)	0.16
No children in household, % (SD)	45.74(7.42)	49.78(9.00)	47.76(8.35)	−4.04
Years at workplace, mean(SD)	8.12(3.00)	11.38(2.98)	9.75(3.37)	−3.26**
Occupation,% (SD)				
Professional	32.42(15.66)	31.74(17.50)	32.08(16.29)	0.68
Manager	11.28(4.27)	17.01(6.27)	14.14(6.02)	−5.74**
Sales	9.97(18.90)	5.15(8.54)	7.56(14.60)	4.82
Service Industry	3.60(4.14)	3.35(4.46)	3.48(4.14)	0.25
Standard Office	21.63(10.63)	18.03(8.38)	19.83(9.57)	3.60
Equipment, Transportation operator, manufacturing	5.66(13.74)	8.91(14.11)	7.29(13.76)	−3.25
Other	15.44(10.35)	15.80(7.95)	15.62(9.06)	−0.37
Comfortable with Internet, mean(SD)	3.34(0.20)	3.51(0.22)	3.43(0.22)	−0.17*
Comfortable with email, mean(SD)	3.35(0.24)	3.52(0.23)	3.43(0.24)	−0.18
Health/Behavior variables				
Arthritis,% (SD)	14.15(5.49)	18.95(6.96)	16.55(6.62)	−4.79
Heart Disease, % (SD)	1.92(1.90)	3.85(2.93)	2.89(2.62)	−1.93
High Blood Pressure,% (SD)	28.27(10.32)	33.26(7.16)	30.77(9.08)	−4.98
Meeting PA Recommendations,%	10.16(4.16)	6.78(2.37)	8.47(3.74)	3.38*

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* $p<0.05$

** $p<0.01$

*** $p<0.001$

Table 2

The focus of daily e-mails by day of the week and content examples by program cycle

Week Day	A Better Way (1st Quarter)	Climb the Hill (2nd Quarter)	Become the Expert (3rd Quarter)	Automatic Habits (4th Quarter)
Monday: Success Stories	Highlights people who have just began to lose weight	Highlights people who have sustained and continued weight loss for 6 months or more	Highlights people who have advocated successfully for organizational change to support healthy lifestyles	Highlights long time advocates and people who have lost substantial weight and kept it off for over a year.
Tuesday: Exercise	Safe and slow progression	Additional benefits of moderate exercise and weight training	Explores worksite policies or resources that would allow for exercise breaks	Advocating for healthier worksite policy and support for regular exercise.
Wednesday: Healthful Eating	The information basics on what foods are most healthful	Quick, easy, and healthful meal preparation	Explore worksite opportunities for healthful snacks. Identify unhealthy eating practices or policies.	Advocating for healthier worksite policy and support for healthful eating.
Thursday: Barriers & Solutions	Personal obstacles and strategies to overcome them.	Obstacles that could lead to relapse and strategies to overcome them.	Obstacles to environmental change and strategies to overcome them.	Successfully implementing environmental changes.
Friday: Ask the Expert	Based on frequently asked questions from preliminary studies.	Based on frequently asked questions from preliminary studies related to relapse prevention.	Based on research literature related to community and environmental change implementation.	Based on research literature related to community and environmental change implementation.
Saturday: Portion Sizes	The information basics on portion sizes across food groups.	Maintaining healthful portion sizes when eating out	Methods to change your home eating environment to encourage appropriate portion sizes	Methods to change your work eating environment to encourage appropriate portion sizes
Sunday: Motivation	Goal setting, weekly journaling, and feedback on progress.	Goal setting, weekly journaling, and feedback on progress.	Goal setting, weekly journaling, and feedback on progress.	Goal setting, weekly journaling, and feedback on progress.

Table 3

The 6-month Effect: Time and Group by Time Effect (Intention to Treat)

Outcome (N)[ICC]	Baseline M(SD)	6-Month M(SD)	Time Effect (Robust SE)	Group by Time Effect (Robust SE)
Continuous Outcomes				
Objectively Measured Weight in lbs (1,503)[0.056]	207.61(45.08)	205.74(45.33)	−1.86***(0.35)	
INCENT (872)	206.04(44.04)	203.77(44.17)	−2.27***(0.37)	−0.97(0.73)
LMW (631)	209.77(46.44)	208.47(46.79)	−1.30*(0.63)	
BMI, kg/m2 (1,499)[0.047]	33.36(6.41)	33.07(6.49)	−0.29***(0.06)	
INCENT (870)	33.26(6.39)	32.90(6.49)	−0.36***(0.06)	−0.16(0.12)
LMW (629)	33.51(6.44)	33.31(6.50)	−0.20*(0.10)	
Fruit Veg Serving/day (1,500)[0.024]	3.09(1.47)	3.33(1.52)	0.24***(0.03)	
INCENT (870)	3.01(1.44)	3.33(1.51)	0.32***(0.04)	0.20***(0.06)
LMW (630)	3.21(1.51)	3.33(1.54)	0.12**(0.04)	
Total Fat, gms (1,490)[0.021]	95.28(20.58)	89.31(20.54)	−5.96***(0.48)	
INCENT (868)	95.48(21.01)	89.43(21.31)	−6.05***(0.72)	−0.22(0.92)
LMW (622)	94.99(19.99)	89.16(19.43)	−5.83***(0.56)	
Saturated Fat, gms (1,490)[0.031]	26.56(7.80)	24.37(7.70)	−2.19***(0.18)	
INCENT (868)	26.31(7.81)	24.09(7.86)	−2.21***(0.26)	−0.07(0.34)
LMW (622)	26.91(7.78)	24.77(7.47)	−2.14***(0.21)	
Cholesterol, gms (1,490)[0.047]	262.07(73.61)	242.70(72.96)	−19.37***(1.57)	
INCENT (868)	260.71(73.96)	241.04(74.50)	−19.67***(2.34)	−0.71(2.98)
LMW (622)	263.98(73.14)	245.02(70.74)	−18.96***(1.83)	
Dietary Fiber, gms (1,500)[0.042]	11.56(4.85)	12.31(5.05)	0.75***(0.09)	
INCENT (870)	11.25(4.72)	12.25(4.96)	1.00***(0.08)	0.58***(0.14)
LMW (630)	11.98(4.99)	12.40(5.16)	0.42***(0.11)	
Total SSB kcal (1,503)[0.030]	191.77(218.79)	164.66(204.50)	−27.11***(4.37)	
INCENT (872)	188.92(208.64)	162.50(199.53)	−26.42***(6.07)	1.66(8.63)
LMW (631)	195.71(232.19)	167.63(211.30)	−28.08***(6.14)	
Daily Water, floz (1,495)[0.008]	27.65(18.05)	28.81(17.87)	1.16*(0.46)	
INCENT (866)	28.19(18.11)	29.85(18.10)	1.66**(0.49)	1.19(0.97)
LMW (629)	26.90(17.95)	27.38(17.46)	0.47(0.84)	
Total minutes of vigorous Physical Activity (1,486)[0.007]	18.39(47.11)	26.06(56.32)	7.67***(1.23)	
INCENT (863)	17.88(45.05)	26.93(55.73)	9.06***(1.52)	3.31(2.33)
LMW (623)	19.10(49.86)	24.85(57.15)	5.74**(1.76)	
Total minutes of moderate Physical	45.34(82.42)	66.00(98.94)	20.66***(3.00)	4.51(5.60)

Outcome (N)[ICC]	Baseline M(SD)	6-Month M(SD)	Time Effect (Robust SE)	Group by Time Effect (Robust SE)
Activity (1,480)[0.003]				
INCENT (861)	45.05(82.61)	67.60(99.96)	22.55***(4.41)	
LMW (619)	45.75(82.21)	63.79(97.54)	18.04***(3.45)	
Dichotomous Outcomes				
5% Weight Loss,% (1,503)[0.013]	0.00(0.00)	12.51(33.09)	12.51***(1.51)	
INCENT (872)	0.00(0.00)	14.56(35.29)	14.56***(1.71)	4.90(3.01)
LMW (631)	0.00(0.00)	9.67(29.57)	9.67***(2.48)	
Meeting 5-a-day FV recommendation,% (1,500)[0.012]	9.93(29.92)	12.60(33.20)	2.67***(0.73)	
INCENT (870)	8.39(27.74)	12.30(32.86)	3.91***(0.92)	2.96*(1.29)
LMW (630)	12.06(32.60)	13.02(33.67)	0.95(0.91)	
Meeting less than 30% percent fat,% (1,490)[0.010]	17.79(38.25)	25.10(43.37)	7.32***(0.90)	
INCENT (868)	18.55(38.89)	25.92(43.85)	7.37***(1.16)	0.14(1.83)
LMW (622)	16.72(37.35)	23.95(42.72)	7.23***(1.42)	
Meeting Vigorous PA recommendation,% (1,486)[0.010]	11.84(32.32)	18.03(38.46)	6.19***(0.96)	
INCENT (863)	11.70(32.16)	18.66(38.98)	6.95***(1.42)	1.82(1.76)
LMW (623)	12.04(32.57)	17.17(37.75)	5.14***(1.04)	
Meeting Moderate PA recommendation,% (1,480)[0.004]	12.16(32.70)	17.84(38.30)	5.68***(1.15)	
INCENT (861)	12.08(32.61)	18.12(38.54)	6.04***(1.65)	0.87(2.22)
LMW (619)	12.28(32.84)	17.45(37.98)	5.17**(1.49)	

[a] Note: Other control variables included in models: PA Rec (not in the four physical activity outcome models), Arthritis[40], Heart Disease[40], High Blood Pressure[40], Uncomfortable with Internet, Age[11,39], Female[11,39], White[11,39], Black[11,39], Hispanic[11,39], Occupation[11,39], Income[11,39], Tenure and Health Literacy[11,39].

[b] All models were estimated using mixed linear regression model with cluster robust standard errors to take into account the clustering at the worksite level

[c] *p<0.05 **p<0.01 **p<0.001