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## Pilot Study Evaluating the Feasibility and Initial Outcomes of a Primary Care Weight Loss Intervention with Peer Coaches

Gareth R. Dutton, PhD, Janice M. Phillips, BS, Meghana Kukkamalla, BS, Andrea L. Cherrington, MD, and Monika M. Safford, MD

University of Alabama at Birmingham, Department of Medicine, Division of Preventive Medicine, Birmingham, AL

### Abstract

**Purpose**—The purpose of this single-group pilot study was to evaluate the feasibility, acceptability, and initial outcomes of a novel approach to delivering weight loss treatment in primary care using peer coaches and targeting predominantly African American patients with diabetes or pre-diabetes.

**Methods**—Participants (N=33) were recruited from a family medicine practice for a 6-month lifestyle intervention. Eligible patients were obese adults (body mass index; BMI  $\geq 30$  kg/m<sup>2</sup>) with 1 additional cardio-metabolic risk factor(s), including 1) elevated hemoglobin A1C or diagnosed diabetes, 2) elevated blood pressure, 3) elevated triglycerides, and/or 4) low HDL. The intervention included a combination of 12 group-based office visits with health professionals plus 12 individual phone contacts with peer coaches. Outcomes included weight loss, program adherence, and program satisfaction.

**Results**—Participants (mean age =  $56 \pm 10$  years; BMI =  $42.9 \pm 11.0$  kg/m<sup>2</sup>) were predominantly female (88%) and African American (85%). Treatment resulted in a significant mean weight loss of  $-4.5 \pm 7.2$  kg, and approximately 27% of participants lost  $\geq 5\%$  of their initial body weight. Participants completed approximately 50% of the group visits and 40% of the telephone calls with peer coaches. Participants rated both components of the intervention favorably.

**Conclusions**—Results of this pilot study indicated that a primary care weight management program including group-based visits and peer-delivered telephone contacts achieved significant weight loss among predominantly African-American patients with weight-related comorbidities, including diabetes and pre-diabetes. Additional research is needed to examine the long-term outcomes of this novel approach and to identify program components supporting patients' success.

Obesity represents a major healthcare challenge in the U.S. as nearly 35% of adults are obese,<sup>1</sup> and obesity is a risk factor for a variety of health conditions such as type 2 diabetes, hypertension, hyperlipidemia, and stroke.<sup>2</sup> Approximately 12% of U.S. adults currently have diagnosed or undiagnosed diabetes, and an additional 37% have pre-diabetes.<sup>3</sup> Also, African Americans and other racial/ethnic minorities are disproportionately affected by obesity and diabetes.<sup>1, 3</sup>

Given the scope of these problems and the protective health benefits associated with modest weight loss, current clinical guidelines recommend physicians counsel obese patients to lose weight through lifestyle interventions targeting diet, physical activity, and behavioral strategies to promote treatment adherence.<sup>2</sup> Evidence-based interventions for weight management have been developed (e.g. the Diabetes Prevention Program),<sup>4-5</sup> yet there has been limited success in adapting and disseminating these programs to applied clinical settings such as primary care. In fact, there are numerous barriers to the provision of weight loss counseling in primary care, including time constraints, insufficient reimbursement, and lack of physician training for behavioral counseling.<sup>6-10</sup> Thus, physicians may not provide appropriate weight loss recommendations to at-risk patients.<sup>11-13</sup>

Most previous efforts to develop and deliver weight loss interventions in primary care have demonstrated very modest effects that are not sustained over time.<sup>14-15</sup> In particular, low-intensity interventions with limited contacts and/or programs relying primarily on physicians for treatment delivery are minimally effective in promoting weight loss.<sup>14</sup> More intensive interventions as well as programs utilizing other trained healthcare professionals (e.g., nurses, nurse practitioners, registered dietitians) generally achieve greater weight loss.<sup>14, 16-17</sup> This model of care, however, may be impractical in many clinical settings given the limited availability of some specialties and other clinical demands already placed on these providers.

One potentially effective and practical alternative for primary care involves weight loss interventions delivered by peer coaches, which may address some of the barriers and limitations of previous treatment approaches. Peer coaches are individuals who participate in some capacity in health promotion but have no formal professional healthcare training and have an existing relationship or other connection with the community or population receiving care.<sup>18-19</sup> A handful of recent trials have examined weight loss interventions delivered by peer coaches,<sup>20-23</sup> and these treatments generally achieved clinically meaningful weight loss. However, none of these weight loss programs were implemented in primary care.

Therefore, the purpose of this single-group pilot study was to evaluate the feasibility, acceptability, and preliminary outcomes of a six-month weight loss intervention for obese, predominantly African American primary care patients at increased risk for diabetes or diabetes-related cardiovascular comorbidities. This novel intervention included a combination of group-based office visits plus individual telephone contacts with a trained peer coach with the long-term goal of identifying an alternative weight loss intervention that is effective, feasible, and sustainable for primary care. Outcomes reported here include weight change, treatment satisfaction, and process measures of attendance to group sessions and completion of telephone contacts.

## Method

### Sample and Setting

Participants were recruited from an urban family medicine practice with seven family medicine physicians affiliated with an academic medical center. Patients were recruited

through flyers available at the clinic's front desk and posted in examination rooms. These flyers indicated the availability of a weight loss study being conducted in the family medicine practice, and interested individuals were encouraged to contact research staff to learn more and determine their eligibility. Physicians and clinic staff also made referrals to the study for interested patients. During routine clinical encounters, clinic staff made patients aware of the study opportunity, provided them with the contact information for study staff, and encouraged them to contact the research team directly. Patients completed a telephone screening assessment with the study's project coordinator to determine eligibility.

Eligible patients were obese (BMI  $\geq 30$  kg/m<sup>2</sup>) adults  $\geq 21$  years-old currently receiving their primary care through the practice. In addition to obesity, patients had  $\geq 1$  additional cardio-metabolic risk factor(s), including 1) elevated blood pressure ( $\geq 140/90$  mm Hg), 2) elevated hemoglobin A1C ( $>5.7$ ) or diagnosed diabetes, 3) elevated triglycerides ( $\geq 200$  mg/dL), and/or 4) low HDL ( $<40$  mg/dL). These inclusion criteria were assessed via self-report during the telephone screening and confirmed via medical chart review. Weight/BMI and A1C were subsequently measured objectively in the clinic by trained research staff during the in-person baseline assessment as well.

Of 47 patients initially referred to the study and screened by telephone, 10 were excluded for lack of availability or interest (n=5), BMI  $<30$  kg/m<sup>2</sup> (n=3), weight loss  $\geq 4.5$  kg in the past six months (n=1), and lack of a comorbid medical condition (n=1). Of 37 patients scheduled for an initial orientation and assessment, 33 attended and provided informed consent and enrolled in the pilot study. Participants were provided a \$40 honorarium at the follow-up assessment.

## Research Design

This pilot and feasibility study included a single-group, pre-post design examining the six-month effects of a primary care weight loss intervention incorporating peer support as a primary treatment component. Weight was measured at baseline and post-treatment, and weight change served as the primary outcome. Other outcomes and process measures included participant adherence and satisfaction measured at post-treatment. Approval for this study was obtained from the Institutional Review Board at the University of Alabama at Birmingham.

## Intervention

The content of the 6-month intervention was modeled after the lifestyle interventions of the Diabetes Prevention Program<sup>4</sup> and Look AHEAD weight loss trials.<sup>24</sup> The content provided to participants, including all session handouts, was abbreviated from the original protocols but continued to cover fundamental components of evidence-based lifestyle interventions, including recommendations for dietary modification, increased physical activity, and behavioral strategies designed to promote treatment adherence.<sup>4, 24–25</sup> Participants received pedometers, food scales, and measuring cups/spoons to facilitate self-monitoring and behavior change, and group leaders distributed self-monitoring logs at each session. Participants were encouraged to work toward a 5–10% reduction in body weight over the

six-month intervention and were provided graphs with weight loss goals to track their progress.

The intervention included a combination of 12 group-based office visits plus 12 individual phone contacts over six months (Table 1). By design, the frequency of contact was more intensive earlier in the program and decreased over time for both the group sessions and telephone contacts. Primary care physicians were not directly involved in treatment delivery, although participants were encouraged to discuss progress with their physician during regularly-scheduled medical appointments.

**Group visits**—The group-based office visits included private weigh-ins and were designed to cover the program content relevant to making dietary, activity, and other behavioral changes, including instruction on the program goals of reducing energy intake to 1,200–1,500 kcal/day (for individuals weighing <250 pounds) or 1,500–1,800 kcal/day (for individuals weighing ≥250 pounds). Participants were also encouraged to gradually increase moderate-intensity physical activity to 180 minutes/week. Finally, a variety of behavioral strategies relevant to weight loss were discussed, including self-monitoring, problem-solving, goal-setting, social support, cognitive restructuring, stimulus control, and relapse prevention.<sup>25</sup> Group-based office visits lasted 60 minutes, included approximately 15 participants per group, and were facilitated by a clinical psychologist, registered dietician, or exercise physiologist experienced in the delivery of behavioral weight loss interventions.

**Phone contacts**—The individual telephone contacts were conducted by trained peer coaches and were designed to enhance patients' motivation and commitment to weight-related behavior change. There were a total of five peer coaches completing telephone contacts with participants, and each coach was assigned 6–7 patients to follow over the course of the program. Each peer coach worked with the same participants for the duration of the program. Each coaching call, which was intended to last 10–15 minutes, followed a semi-structured format in which coaches reviewed patients' progress and challenges, and they assisted patients in setting goals and developing effective problem-solving strategies. While peer coaches were encouraged to attend the group-based office visits, this was not required.

In addition to working directly with patients during the 12 scheduled phone contacts, peer coaches communicated with group facilitators/interventionists about any group sessions that patients anticipated missing. Peer coaches were also trained to contact group facilitators/interventionists about any other unresolved barriers, concerns, or specific clinical care questions (e.g., carbohydrate intake, blood glucose monitoring) raised by patients.

### Peer Coach Training and Supervision

Peer coaches were individuals who had previously achieved their own clinically meaningful weight loss (i.e., >5%) through lifestyle modification as part of a previous weight loss protocol conducted by the research team. Prior to program initiation, peer coaches received approximately six hours of training on effective patient-centered communication, problem-solving, and goal-setting. Principles from motivational interviewing were integrated throughout the peer coach training.<sup>26</sup> Training included a combination of didactic

presentations and interactive learning activities, including role-playing and opportunities for feedback on implementing the targeted communication skills. During treatment implementation, coaches were encouraged to participate in weekly teleconference calls with the other peer coaches, a coach coordinator, and the principal investigator. These calls were designed to provide coaches with ongoing support and supervision to address any issues and promote consistency of treatment delivery. Peer coaches were compensated \$100 for initial training and \$100 for each participant coached. Because each coach was assigned 6–7 participants, they received a total of \$700–800 for the six-month program.

## Measures

**Demographics and medical history**—At baseline, participants reported their age, sex, race, education level, marital status, and current tobacco and alcohol use. Participants also self-reported a history (yes/no) of the following medical conditions: high blood pressure, heart attack, chest pain, type 2 diabetes, gestational diabetes, pre-diabetes, arthritis, sleep apnea, high cholesterol, dizziness/fainting, asthma or chronic lung disease, and orthopedic problems. The total number of medical conditions was computed for each participant. A small amount of blood was collected via a finger stick at baseline to measure A1C.

**Weight and height**—Weight and height were measured in the primary care clinic. Weight was measured to the nearest 0.1 kg using a calibrated digital scale. Height was measured to the nearest 0.1 cm using a wall-mounted stadiometer. For participants who did not complete the post-treatment assessment, recent clinic visit weights were accessed via electronic health records (EHR). EHR weights were imputed if they were recorded within a four-week period (+/– two weeks) of the study assessment. EHR weights were used for three participants at post-treatment.

**Treatment adherence**—Group leaders recorded participant attendance at group sessions, and peer coaches documented the number of calls completed with each participant. Coaches also documented the length of calls.

**Treatment satisfaction**—At post-treatment, participants completed a brief survey assessing satisfaction with treatment, including items related to overall program satisfaction, helpfulness, and convenience of the group visits and phone contacts. This survey was modeled after other program satisfaction measures used in previous research<sup>27, 28</sup> and modified for use in the current study by the research team.

## Statistical Analysis

Descriptive statistics, including mean and proportions, were used to summarize sample characteristics and other relevant outcomes such as treatment adherence and satisfaction. Paired samples t-tests were used to examine changes in body weight between baseline and post-treatment, and  $\chi^2$  tests or Fisher's exact tests were used to assess association between categorical variables. Given the intent-to-treat analysis used for this study, patients lost to follow-up were retained in analyses.

## Results

### Baseline Characteristics

Participant characteristics are summarized in Table 2. Weight loss participants were predominantly African American (28 of 33; 85%), female (29 of 33; 88%), severely obese (mean BMI=42.9 kg/m<sup>2</sup>), and had a mean A1C=6.9% (range =5.1% to 13.0%).

### Weight Loss

Post-treatment evaluation performed at month six indicated a significant mean weight loss of  $-4.5 \pm 7.2$  kg, which corresponded to a  $-3.7 \pm 5.5\%$  reduction in initial body weight,  $p<0.001$ . Additional analyses including only participants completing the protocol ( $n=28$ ) yielded similar but slightly greater weight loss estimates of  $-5.0 \pm 7.3$  kg, or  $-4.0 \pm 5.6\%$ ,  $p<0.001$ . At post-treatment, 9 of the 33 participants (27.3%) had lost 5% of their initial body weight.

### Treatment Engagement

Participants attended approximately 50% of the group visits (i.e.,  $6 \pm 4$  of 12 possible sessions) and completed approximately 40% of the intended telephone calls (i.e.,  $5 \pm 3$  of 12 scheduled calls). The mean duration of completed calls was  $14 \pm 7$  minutes.

### Treatment Satisfaction

Participants' attitudes about the overall program as well as its separate components (i.e. group visits and telephone contacts) were assessed with a post-treatment survey. In general, participants endorsed positive attitudes toward the weight loss program (see Table 3).

## Discussion

Results of this pilot study indicated that a primary care weight management program including group-based visits and peer-delivered telephone contacts achieved modest but significant weight loss after six months of treatment. These outcomes were observed among predominately African American patients at elevated risk for cardio-metabolic disease (i.e., presence of obesity plus one or more additional risk factors). Results also suggested that both components of the program, including group visits and individual phone contacts, were rated favorably by participants. Attendance was modest (i.e., 40–50%), which was similar to or slightly lower than attendance rates observed with other applied weight management programs.<sup>16–17, 21, 29</sup>

Despite calls from various health organizations for an increased focus on obesity screening and treatment in primary care,<sup>2, 30</sup> physician-delivered obesity treatments have achieved mixed and very modest results.<sup>14–15</sup> These limited effects may be attributable to the numerous barriers encountered by physicians trying to provide weight loss counseling in primary care.<sup>6–10</sup> Weight management programs delivered by other, non-physician health professionals may yield more robust outcomes,<sup>14</sup> although these programs face many of the same practical challenges to implementation as physician-delivered programs. Thus, it is

important to develop more effective, less expensive, and more accessible resources for primary care obesity treatment.<sup>23</sup>

While the current protocol also relied on health professionals to facilitate the group-based sessions, all telephone calls (i.e., half of the total treatment contacts) were conducted by peer coaches. Therefore, this represents an initial step in moving toward an alternative approach for obesity treatment delivery in primary care. Consistent with other peer-based weight loss interventions conducted in non-clinical settings,<sup>21</sup> future work could examine the feasibility and effects of creating pre-recorded content (e.g., DVDs, online videos) to convey the dietary, exercise, and other behavioral strategies typically presented by trained health professionals to better address sustainability and dissemination in primary care.

Peer coaches, community health workers, or similar individuals from the community who are not trained healthcare providers may offer a novel, efficient, and cost-effective strategy for delivering weight loss programs. In fact, several recent weight loss trials highlight the potential efficacy of peer-delivered weight loss programs in a variety of community-based settings.<sup>21–22, 31</sup> There are several key features of peer-delivered programs, including the provision of informational and emotional support, that make this approach appealing and potentially effective for the management of obesity.<sup>19</sup> In addition, peer coaches may be more accessible to patients and more familiar with their personal experiences than healthcare providers.<sup>18–19, 32</sup> This is certainly true for the current intervention, as peers recruited for this project had previous experiences with successful weight loss themselves. Treatment delivered by peer coaches may be particularly useful and needed among racial/ethnic minorities and/or individuals with limited financial resources as these represent populations disproportionately affected by obesity and obesity-related conditions.<sup>1, 3</sup> To our knowledge the current investigation is the first to examine a primary care program partially delivered by peers and targeting predominantly African American patients.

The current results should be interpreted in the context of the study's strengths and limitations. Limitations include the relatively short duration of the study (i.e., six months), such that the longer-term effects of this intervention are unknown. Since this was a pilot study, it included a relatively small sample size with no comparison condition, and adherence to the treatment protocol was modest (40–50% completion rates). Also, other clinical outcomes, such as blood pressure or lipids, were not collected. The primary strength of this study is its novel investigation of using peer coaches to compliment an adapted evidence-based behavioral program by providing telephone-based support designed to facilitate effective problem-solving and strengthen motivation of participants in a primary care weight loss program. Additional strengths include targeting a high-risk group of predominately African American patients, provision of structured training and supervision for peer coaches, and a high participant retention rate (i.e., 85%).

In summary, use of peer coaches provides a novel approach to obesity treatment delivery that may be effective and feasible in primary care. Indeed, current results indicate this approach is promising and worthy of further investigation. Future research should include larger samples, longer follow-up, and a randomized design that includes a comparison condition to better understand the effects of peer-delivered primary care programs. It may

also be worthwhile to modify these programs to have greater reliance on the peer coaches for treatment delivery and/or develop some intervention components that can be delivered via alternative modalities (e.g., pre-recorded content). This could decrease reliance on health professionals, which is a barrier for large-scale implementation and dissemination.

In regard to the peer coaches, it will be important to identify individual characteristics or program training procedures that are associated with coaches' success in this role. In addition, the impact of the modality of treatment delivery remains unknown. While the current program relied on in-person and telephone contacts, the adherence to each ranged from 40–50%. Future research should examine which modalities (or combination of modalities) are most effective and accessible in this clinical setting. In addition to treatment modality, the intensity and schedule of treatment contacts deserves further attention, as it is imperative to develop a program that achieves clinically meaningful weight loss while remaining feasible for patients, coaches, and primary care practices.

## Implications

Nearly half of adults in the U.S. are affected by diabetes or pre-diabetes, and obesity is a well-known risk factor for these conditions. Lifestyle interventions for weight management delivered in primary care have the potential to reach large numbers of these at-risk individuals and improve their health outcomes, although previous efforts to implement such programs in primary care have had limited success. These preliminary results suggest that offering group-based office visits delivered by non-physician health professionals and training peer coaches to deliver additional telephone support may be a feasible and effective approach for weight loss, diabetes management, and diabetes prevention. If such programs are adopted in healthcare settings, diabetes educators could play a variety of important roles in the development, implementation, and evaluation of these interventions, including training and supervising peer coaches, monitoring outcome measures, and coordinating care and communication between peer coaches and the rest of the diabetes care team.

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**Table 1**

## Schedule of Treatment Contacts and Topics

Week	Group Visit	Group Topic	Telephone Contact
1	✓	Getting Set for Success	✓
2	✓	Setting Goals	✓
3	✓	Becoming a Fat Detective	✓
4	✓	Stepping Up	✓
5	---	---	✓
6	✓	Healthy Eating Patterns	✓
7	✓	Building a Healthy Diet	✓
8	✓	Keep on Moving	---
9	---	---	✓
10	✓	Eating and Activity Cues	---
11	✓	Eating Out Healthy	---
12	---	---	✓
13	---	---	---
14	✓	Slipping and Not Falling	---
15	---	---	---
16	---	---	✓
17	---	---	---
18	✓	Negative Thoughts	---
19	---	---	---
20	---	---	✓
21	---	---	---
22	✓	Looking Forward	---
23	---	---	✓
24	---	---	---

**Table 2**

## Baseline Characteristics

Characteristic	M ± SD, or N, %
Age (years)	56.0 ± 10.2
Weight (kg)	115.5 ± 28.8
BMI (kg/m <sup>2</sup> )	42.9 ± 11.0
Female	29, 87.9%
African American	28, 84.8%
Education (high school or less)	14, 42.4%
HbA1C <sup>a</sup>	6.9 ± 1.8%
No Diabetes (A1c<5.7%)	8, 26.7%
Pre-diabetes (A1c=5.7–6.5%)	10, 33.3%
Type 2 diabetes (A1c ≥ 6.5%)	12, 40.0%

<sup>a</sup>Three participants had missing HbA1C values.

**Table 3**Participants' Reported Satisfaction Following Treatment<sup>a</sup>

	M ± SD or N, %	
	Group Visits	Telephone Contacts
Overall satisfaction <sup>b</sup>	4.6 ± 0.9	4.4 ± 1.1
Overall helpfulness <sup>b</sup>	4.8 ± 0.4	4.3 ± 0.9
Group leaders provided helpful nutrition information	24, 92.3%	---
Group leaders provided helpful exercise information	24, 92.3%	---
Other patients helped support and encourage me	23, 88.5%	---
It was convenient meeting in the doctor's office	19, 73.1%	---
The frequency of the group meetings was about right	18, 69.2%	---
My peer coach helped motivate me	---	23, 88.5%
My peer coach encouraged and supported me	---	22, 84.6%
My peer coach offered useful tips about eating	---	22, 84.6%
It was convenient to talk by phone instead of in-person	---	21, 80.8%
The frequency of calls with my peer coach was about right	---	19, 73.1%

<sup>a</sup>Based on 26 valid and completed post-treatment surveys.

<sup>b</sup>Based on 5-point scale with higher scores corresponding to more positive attitudes toward the program.