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Project HEAL: Peer Education Leads to Weight Loss in Harlem

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Abstract

Background—Obesity and diabetes are epidemic in the predominantly minority Harlem community. To address them, a coalition of community and academic leaders tested the effectiveness of a peer-led weight loss course.

Methods—The coalition developed Project HEAL: Healthy Eating, Active Lifestyles through extensive collaboration with community members and experts in nutrition, exercise, and peer education. We piloted the course in a local church and assessed its impact through pre and post course weights, self-reported behaviors and quality of life.

Results—Twenty-six overweight and obese African American adults lost a mean of 4.4 pounds at 10 weeks, 8.4 pounds at 22 weeks, and 9.8 pounds at 1 year. Participants reported decreased fat consumption and sedentary hours, and improved health related quality of life.

Conclusions—A peer-led, community-based course can lead to weight loss and behavior change. The minority communities most affected by obesity and diabetes may benefit from this low-cost, culturally appropriate intervention.

Keywords

Diabetes; obesity; weight loss; peer education; nutrition; physical activity; community-based participatory research

Obesity and diabetes in the U.S. are burgeoning public health problems that lead to significant economic cost, medical complications, and increased mortality.^{1–5} Communities of color bear a disproportionate share of the national burden of obesity and diabetes.^{6–9} Weight loss decreases diabetes incidence and mortality,^{10–20} even eliminating racial and ethnic disparities in diabetes incidence.¹⁰ However, health providers frequently lack the time or training to work with obese patients.^{21–23} Physicians are spending less time counseling obese patients to lose weight, even as obesity rates rise.²⁴ Nutritionists are often monolingual, and not readily available in the non-White, low-income communities that need them most.^{25–27}

In contrast, peer educators are widely available, cost-effective, and culturally attuned, and could be of great benefit in communities with limited resources and a history of medical mistrust.^{28–34} Peer programs may be sustained long past the period of the grant funding that demonstrates their effectiveness, distinguishing them from short-term projects that collapse when funding sources are withdrawn.

East Harlem (EH) presents a unique opportunity to study the potential role of peer education in facilitating weight loss. A low-income community, EH is 36% Black and 52% Latino, and has the highest prevalence of obesity and of diabetes in New York City. Compared with their predominantly White, high-income neighbors on the Upper East Side, EH residents suffer 4-fold greater rates of obesity, 7-fold greater rates of diabetes, and over 5-fold greater diabetes mortality.^{35–38}

The East Harlem Diabetes Center of Excellence is a community-academic coalition that came together to address this epidemic.^{39–41} The coalition operates on the principles of community-based participatory research, an egalitarian collaboration among community, clinical, and public health leaders that recognizes the unique strengths of all partners and equitably involves all partners in research.^{42–44} To evaluate the effectiveness of a peer-led nutrition and physical activity course in leading to weight loss, the coalition sought to marry elements of successful weight loss interventions with the practical and culturally and economically appropriate elements of peer education.

Methods

Intervention development

The coalition formed a sub-committee of local nutritionists, health professionals, and outreach workers to develop a program patterned after the proven-effective Stanford University Chronic Disease Self-Management Program.^{30–31} Stanford uses peer leaders with backgrounds similar to those of the participants, and includes weekly action plans, group feedback and support to inspire change and to model self-management and problem-solving. Participants need not be literate. We worked with Stanford's developers to focus their program to address weight loss.

Using local survey and focus group data and their own experiences, sub-committee members built a conceptual model that details barriers to weight loss in EH (Figure 1).^{39,40,45} The subcommittee identified relevant diet and exercise messages by reviewing weight loss curricula and consulting with experts in nutrition, physical activity, community outreach, and education, to include content that conformed to accepted guidelines and to take into account the environmental, economic, and cultural realities of EH. The group identified key messages, including 1) portion control; 2) filling half the plate with fruits and vegetables of multiple colors at each meal; 3) drinking calorie-free beverages; 4) cutting fat; 5) making daily life more active; and 6) eating healthy food on a budget and at fast food venues. We shortened the original Stanford course from 150 to 90 minutes, and added two refresher classes,³⁰ resulting in 8 sessions spread over 10 weeks.

All course elements, from the name to content to program evaluations, were the fruits of community-academic collaboration. The coalition named the course *Project HEAL: Healthy Eating, Active Lifestyles*. The Mount Sinai Institutional Review Board approved the pilot course.

Assessment

The primary outcome was change in weight. To assess body mass index (BMI), we measured weights (on a digital scale) and heights after asking participants what they thought

their weights and heights were. To assess secondary outcomes, including changes in knowledge, attitudes, and behaviors, we chose validated scales for domains including knowledge about healthy eating, exercise, and weight;⁴⁶ food choice;⁴⁷ total fat, fruit and vegetable intake;^{48–49} physical activity;^{50–51} sedentary time;⁵² barriers to healthy eating and exercise;^{53–54} body image; weight loss locus of control;⁵⁵ depressive symptoms;⁵⁶ perceived health-related quality of life;^{57–59} food security; demographic questions; and self-reported height and weight.^{60–62} We added items to assess food preparation, food shopping, and perception of neighborhood food quality, that we developed and employed in an earlier survey.³⁹ A post-intervention survey also included items so participants could provide feedback about the course. The survey was at a sixth grade reading level.

Intervention conduct

We pilot-tested the course from April to June 2006 at a local Harlem church. We wanted to test the course in English before developing a Spanish-language version, so we responded to a request by a Black church in Harlem whose congregants had expressed interest in information about losing weight. We posted fliers at the church advertising a free course on how to eat healthier, be more active, and lose weight, and the pastor encouraged congregants to attend. Church leaders were involved in the logistics of recruitment, and they decided the course should be offered to the first 30 individuals who signed up.

After providing written informed consent, course participants completed baseline surveys, and the research team measured their heights and weights without shoes, coats, or sweaters. Two trained peer leaders led the 8 sessions at the church. Ten weeks after enrollment, at the eighth and final session of the course, and at 22 and 32 weeks and 1 year after enrollment, trained research assistants, who were blinded to patients' baseline weights, surveyed and weighed participants. Participants received a five-dollar gift for each completed survey.

Statistical analysis

We performed analyses using SPSS versions 13 and 14 (SPSS Inc., Chicago, IL). To characterize participants' baseline characteristics, we used descriptive statistics. To evaluate course impact, we compared pre-course and post-course data using paired samples t-tests at a significance level of $p < .05$ for continuous data, and a non-parametric Wilcoxon matched-pairs signed rank test at a significance level of $p < .05$ for categorical data.

Results

Forty Black church members came to hear about the course, and of these, 32 enrolled in the pilot study. Of the 8 who did not enroll, 2 declined signing informed consent, and 6 did not find the time that was agreed upon by the majority of the group convenient. One person of the 32 enrolled was not overweight ($BMI = 21.2 \text{ kg/m}^2$), was in fact interested in gaining weight, and was excluded from data analysis. Five completed only the first one or two sessions and were excluded from analysis, but were not significantly different in weight, BMI, race, age, gender, income, or education from those who completed the pilot.

The remaining 26 participants attended an average of 6 (75%) of the 8 sessions. Their mean age was 68 years (Table 1). Most were female, moderately well-educated, retired, and lived in low-income households. Over one quarter received emergency food in the past year. Participants reported having a mean of 2 medical conditions, the most common being hypertension and arthritis. At baseline, mean weight was 194.3 pounds, and mean body mass index (BMI) was obese at 32.7 kg/m^2 (range 24.3 to 43.7 kg/m^2). Although 25 of the 26 (96.1%) were overweight ($BMI 25$ – 29.9 kg/m^2) or obese ($BMI \geq 30 \text{ kg/m}^2$) one third self-reported as normal weight ($BMI 18.5$ – 24.9 kg/m^2). Interestingly, when comparing what

participants thought they weighed with their measured weights, group members weighed, on average, 10 pounds more than they thought (range -0.5 to 42 pounds). They did correctly estimate their heights.

Table 2 shows that the 26 participants lost a mean of 4.4 pounds ($p<.001$) or 2.2% of their body weight at 10 weeks. Additional follow up data for 21 of the 26 participants (81%) at 22 weeks, 32 weeks and one year, reveal that group members continued to lose weight. At one year, the mean weight was 185 pounds and the mean BMI was 30.9 kg/m^2 ($p=0.001$). Participants had lost a mean of nearly 10 pounds, or 5% of their initial body weight (range 1.5% to -17.7%).

Participants' self-reported food intake changed from before to after the course (Table 3). At 10 weeks, participants had significantly decreased daily total fat intake from 87.7 to 80.1 grams (recommended daily fat intake is less than 65 grams based on a 2000 kcal diet), daily saturated fat from 23.4 to 20.6 grams (recommended <20 grams), and daily cholesterol intake from 261.9 to 237.0 mg (recommended <300 mg).³⁸ At 1 year, changes were maintained, but not with statistical significance. Daily servings of fruit and vegetables also increased significantly at all time-points (from 3.7 to 4.4 servings per day from baseline to 1 year).

Table 4 shows other changes in self-reported knowledge and behaviors. The number of days per week that participants engaged in more than 30 minutes of moderate exercise did not increase significantly.⁵⁰⁻⁵¹ Amount of sedentary time,⁵² defined as hours per day that participants spend watching television, videos, or DVDs, decreased by more than 1 hour per day at 10 weeks ($p=0.034$), and by nearly 3 hours at 1 year ($p<.001$). Knowledge about diet, exercise, and weight loss,⁴⁶ using a composite three point scale, increased significantly from 2.6 to 2.8 ($p=0.003$) at 10 weeks, but these data were not collected subsequently. Weight loss locus of control,⁵⁵ which revealed a greater internal than external locus of control at baseline, remained unchanged.

Perceived health-related quality of life⁵⁷⁻⁵⁹ improved significantly. The number of participants who labeled their health very good or excellent doubled from the start to the end of the course ($p=.046$). This changed endured, but no longer retained statistical significance at one year. Twenty seven percent of participants screened positive for depressive symptoms⁵⁶ at baseline, and this did not change significantly.

Discussion

Community and academic partners from a diabetes coalition developed and tested a peer-led nutrition and physical activity course in Harlem. Pre-post comparisons among the 26 African American participants in the pilot showed that participants lost nearly 10 pounds (5% body weight) at one year, increased food and exercise knowledge, changed food and exercise related behaviors, and reported improved health-related quality of life. Weight loss was maintained at one-year after enrollment, making it unlikely that weight loss was due to seasonal variations.

In the past, peer education interventions have been shown to change knowledge and behaviors.²⁸⁻³⁴ This is one of the first studies to our knowledge (if not the first) to show that a peer-led program can lead to weight loss. This represents a promising approach to combat the obesity and diabetes epidemics across the nation, in a feasible, low-cost way. Previous studies that have demonstrated weight loss required significant resources, and therefore the programs tested were often not sustainable past their period of grant funding. Project HEAL harnessed the experience and knowledge of professionals and provided this information to laypeople in an easily accessible and easily understood form. By targeting existing social

networks to enroll participants, by locating programs in places where residents already gather, and by utilizing community members who already have the trust of their neighbors as teachers, Project HEAL sought to weave itself into the fabric of the vibrant Harlem community and avoid the pitfalls of so-called drive-by, or helicopter research.

The study is limited in that it is a small pilot study with a relatively homogeneous pool of participants with follow up only to one year, and with a pre-post design that lacks a control group. Follow-up data were available for 21 of 26 (81%) participants, which limits both generalizability and the sample size with which to gauge statistical significance. Future research should evaluate a larger and more diverse population in a randomized-controlled trial. The study may have selected out participants who were more motivated than average, as some church members had expressed to the pastor that congregants wanted information about losing weight, and all volunteered to come to the class.

Our primary and most objective measure, change in weight, was achieved and was maintained at one year of follow-up. Interestingly, more subjective process measures, including self-reported exercise and food intake, did not all parallel weight loss. The small sample size may have precluded statistical significance in some cases, and we used brief screening tools, which were not consistently sensitive to change in other studies.^{48–52} The food frequency questionnaires did not capture changes in portion sizes, and despite significant decreases in estimated total fat and saturated fat intake, participants' consumption continued to exceed daily recommendations even at the end of the study.

Next steps include continuing to follow pilot participants and assessing their weights at regular intervals, conducting a randomized controlled trial to evaluate the effectiveness of Project HEAL, developing a parallel Spanish course, and training more participants from the pilot to lead the course so that it can be self-sustaining.

Front line clinicians, charged with helping individuals prevent and treat diabetes and other chronic conditions, are not sufficiently addressing the obesity epidemic due to limited physician time, and limited availability of trained, culturally consonant nutritionists. Project HEAL presents an affordable, sustainable, weight loss option in communities of color with limited resources and most affected by obesity and diabetes.

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Notes

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Figure 1.
Conceptual model.

Table 1**BASELINE CHARACTERISTICS**

Characteristics	Pilot study participants
Total Participants, n	26
Age, years (SD)	68.3 (10.0)
Female, n (%)	21 (81%)
African American, n (%)	26 (100%)
At least some college education, n (%)	18 (69%)
Employment, n (%)	
Working full-time or part-time	5 (19%)
Retired	19 (73%)
Yearly household income, n (%)	
Less than \$15,000	6 (23%)
\$15,000 to \$30,000	9 (35%)
Greater than \$30,000	5 (19%)
Unknown	6 (23%)
Received emergency food in the past 12 months, n (%)	7 (27%)
Co-morbidities, mean (SD)	1.9 (1.1)
Depressive symptoms, n (%)	7 (27%)
Weight in pounds, SD	194.3 (38.0)
Difference between actual and self-reported weight, pounds (SD)	10.4 (10.0)
Difference between actual and self-reported height, centimeters (SD)	.2 (1.4)
Body mass index (BMI), kg/m ² (SD)	32.7 (5.1)
Normal weight (BMI 18.5 to 24.9), n (%)	1 (4)
Overweight (BMI 25.0 to 29.9), n(%)	7 (27)
Obese (BMI ≥30), n (%)	18 (69)

Table 2**MEASURED CHANGES IN WEIGHT**

	Weight change from baseline	
	Pounds, n (SD)	Weight change, % (SD)
Baseline (n=26)		
10 weeks (n=21) *	-4.4 (5.0)	-2.2 (2.5)
22 weeks (n=21) *	-8.4 (6.7)	-4.2 (3.2)
32 weeks (n=21) **	-8.4 (12.3)	-4.3 (6.4)
1 year (n=21) ***	-9.8 (11.1)	-5.0 (5.5)

*
p<.001,

**
p=.003,

p=.001.

Table 3

BASELINE AND POST-INTERVENTION DIETARY HABITS

	Base line n=26	10 weeks n=26	Difference from baseline	22 Weeks n=21	Difference from baseline	One year n=21	Difference from baseline
Daily fat intake-grams (SD)	87.7 (25.3)	80.1 (19.8)	p=.046	83.7 (20.1)	p=.027	78.6 (22.2)	p=.082
Daily saturated fat-grams (SD)	23.4 (10.5)	20.6 (8.9)	p=.046	22.0 (9.3)	p=.027	20.4 (9.3)	p=.082
Total fat, % (SD)	33.2 (6.4)	31.2 (5.0)	p=.046	32.1 (5.1)	p=.027	30.9 (5.6)	p=.082
Dietary cholesterol-mg (SD)	261.9 (98.3)	237.0 (85.5)	p=.046	248.7 (90.0)	p=.027	236.4 (88.3)	p=.082
Servings fruits & veg. Daily, n (SD)	3.7 (1.7)	3.9 (1.4)	p=.548	4.4 (1.7)	p=.041	4.4 (2.1)	p=.039
Fast food, days/week (SD)	1.5 (1.8)	1.0 (1.0)	p=.130	1.2 (1.0)	p=.505	1.3 (1.4)	p=.540

Table 4
BASELINE AND POST-INTERVENTION BEHAVIORS AND KNOWLEDGE

	Base line n=26	10 weeks n=26	Difference from baseline	22 Weeks n=21	Difference from baseline	One year n=21	Difference from baseline
Exercise, days/week (>30 mins/day) (SD)	3.7 (2.8)	4.6 (2.2)	p=.115	4.2 (1.9)	p=.800	3.9 (2.5)	p=.783
Sedentary activity, hours/day (SD)	5.4 (3.5)	4.1 (2.3)	p=.034	4.5 (2.6)	p=.246	2.5 (1.5)	p<.001
Diet and exercise knowledge (Scale 1-3) (SD)	2.6 (.4)	2.8 (2)	p=.003	not collected		not collected	
Weight loss locus of control (scale 4-16) (SD)	12.8 (2.3)	12.8 (2.0)	p=.872	12.1 (2.6)	p=.171	12.7 (2.3)	p=.553
Health related quality of life			p=.046		p=.132		p=.212
Poor or fair	26.9%	23.1%		14.3%		19.0%	
Very good or excellent	19.2%	38.5%		33.3%		28.6%	