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Hypertension Improvement Project (HIP) Latino: results of a pilot study of lifestyle intervention for lowering blood pressure in Latino adults

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Abstract

Objectives—To assess the feasibility of a culturally tailored behavioral intervention for improving hypertension-related health behaviors in Hispanic/Latino adults.

Design—Feasibility pilot study in a community health center and a Latino organization in Durham, North Carolina (NC).

Intervention—The culturally adapted behavioral intervention consisted of 6 weekly group sessions incorporating motivational interviewing techniques. Goals included weight loss if overweight, adoption of the Dietary Approaches to Stop Hypertension (DASH) dietary pattern, and increased physical activity. Participants were also encouraged to monitor their daily intake of fruits, vegetables, dairy and fat, and to record physical activity. Cultural adaptations included conducting the study in familiar places, using Spanish-speaking interventionist, culturally-appropriate food choices, and physical activity.

Main outcomes—Systolic blood pressure, weight, body mass index (BMI), exercise, and dietary pattern were measured at baseline and at 6 weeks follow-up. Qualitative evaluations of the recruitment process and the intervention were also conducted.

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Conflict of Interest: none

Results—There were 64 potential participants identified via health care provider referrals (33%), printed media (23%), and direct contact (44%). Seventeen participants completed the intervention and had main outcome data available. Participants “strongly agreed/ agreed” that the group sessions provided them with the tools they needed to achieve weight loss, blood pressure control, and the possibility of sustaining the lifestyle changes after completing the intervention. At the end of the intervention, all physiological, diet, and exercise outcomes were more favorable, with the exception of fat. After 6 weeks, systolic blood pressure decreased an average of -10.4 ± 10.6 mmHg, weight decreased 1.5 ± 3.2 lbs, BMI decreased 0.3 ± 0.5 , and physical activity increased 40 minutes per week.

Conclusion—Our findings suggest that lifestyle interventions for preventing and treating hypertension are feasible and potentially effective in the Hispanic/Latino population.

Keywords

Hypertension; Hispanic; Latino; non pharmacologic interventions; blood pressure control; weight loss; DASH dietary pattern; lifestyle intervention

INTRODUCTION

The Hispanic/Latino population is the largest and fastest growing minority group in the United States (U.S.), currently representing 15 % of the total U.S. population (United States Census Bureau, 2008). As this minority group grows, it bears a disproportionate burden of common chronic diseases, including hypertension (Caballero 2007, Ostchega *et al.* 2007, Torres *et al.* 2006). Approximately 25% of Hispanic/Latino adults have hypertension, and rates of awareness, treatment, and control of high blood pressure among those with the condition are low (Martinez-Maldonado 1995). In the most recent National Health and Nutrition Examination Survey, rates of blood pressure control were lowest in Mexican-Americans (17.7%) compared with non-Latino whites (33.4%) and non-Latino blacks (28.1%) (Hajjar *et al.* 2003), and complications of hypertension have also been found to be more frequent in this minority group (Frey *et al.* 1998). Thus, U.S. residents of Hispanic/Latino origin with hypertension represent a group that warrants increased attention. Hypertension prevention and control is a national priority for preventing cardiovascular disease.

Several recent studies and current treatment recommendations (Chobanian *et al.* 2003) highlight the ability of non-pharmacologic interventions, including the DASH dietary pattern (Appel *et al.* 1997, Svetkey *et al.* 1999, Conlin *et al.* 2000, Appel *et al.* 2003), weight loss in the overweight/obese (Stevens *et al.* 2001, Neter *et al.* 2003), reducing sodium intake (Appel *et al.* 2003, Cook *et al.* 2007, Sacks, *et al.* 2001), and increasing physical activity, (Kelley *et al.* 2001a,b, Whelton *et al.* 2002) to prevent and control high blood pressure, independent of one's race and age. Despite the apparent benefits of these lifestyle changes, the number of individuals engaged in these behaviors is low (Luepker *et al.* 2006). Studies of interventions aimed at improving these behaviors have demonstrated effectiveness in modifying individual behaviors and blood pressure (BP) control (Appel *et al.* 2003, Stevens *et al.* 2001, Lasser *et al.* 1995, Appel *et al.* 2001, Whelton *et al.* 1998). In particular, interventions rooted in social cognitive theory (Bandura 1986) and the trans-theoretical, or stages-of change model have been shown to yield improvements in hypertension-related health behaviors (Prochaska and DiClemente 1983, Prochaska *et al.* 1994). These interventions, which also often incorporate techniques of behavioral self management (Watson 1989) and motivational enhancement (Miller and Rollnick 1991, Rollnick and Miller 1995) are believed to help individuals change behavior by emphasizing the importance of the individual's ability to regulate behavior by setting goals and attaining skills to help achieve these goals. The implementation of these interventions and their impact on behaviors and health outcomes in hypertension have been

studied in Caucasians and African-Americans, but whether they are effective when used among Hispanic/Latino individuals with hypertension is unknown (Svetkey *et al.* 2008). Further, little information is available regarding how study procedures and intervention methods may need to be adapted for the intervention to be successfully implemented and evaluated in a population of Hispanics/Latinos.

The Hypertension Improvement Project (HIP) Latino Pilot Study was designed to assess the feasibility of a culturally tailored behavioral intervention aimed at improving hypertension-related health behaviors in Hispanic/Latino adults. In this paper, we describe recruitment and intervention methods used in the HIP-Latino Pilot study, associated challenges and potential solutions, as well as effects of the intervention on behavior and health outcomes.

METHODS

Setting, design, and target population

The HIP Latino pilot study was conducted with Hispanic/Latino adults living in the Triangle area of North Carolina (Durham, Chapel Hill, and Raleigh). We used a pretest-posttest design to assess the impact of a culturally adapted behavioral lifestyle intervention aimed at increasing adoption of recommended health behaviors by Hispanic/Latino participants and effects on weight and blood pressure levels. Because the primary purpose was to assess feasibility, as determined by recruitment, retention, and attendance at intervention sessions, the pilot study was limited in size and duration. Eligibility criteria were: Hispanic/Latino men and women, age 18 years or older, with Spanish as their primary language, and with pre-hypertension or hypertension defined as blood pressure $> 120/80$ mmHg or taking anti-hypertensive medication. Exclusion criteria were pregnancy or nursing and inability to come to the intervention sessions. All aspects of the study were approved by the Duke University Institutional Review Board. All interactions with study participants were conducted in Spanish and all study materials were translated into Spanish.

Recruitment

We used three primary recruitment methods for this study. First, health care providers identified and approached potential candidates, and subsequently provided to the investigators a list of potential candidates to contact about the study. Second, we used printed media such as posted announcements at organizations serving the Hispanic/Latino community, advertisements in Spanish newspapers, and posted flyers in Hispanic/Latino businesses, providing a number for potential participants to contact. Third, we established direct contact with potential participants during Hispanic/Latino events in the community, such as Hispanic/Latino Health Fairs. Most recruitment was conducted at Lincoln Community Health Center (LCHC) in Durham, NC (a federally-funded primary care clinic serving the majority of low-income Hispanics/Latinos in Durham) and El Centro Hispano (ECH) (a community organization in Durham, NC that provides services, social gatherings, and educational opportunities for the local Hispanic/Latino population). To facilitate recruitment and ensure cultural appropriateness of our recruitment efforts, we worked closely with these organizations, the leadership of which was very supportive of efforts to implement healthy lifestyle among their Hispanic/Latino clients. Participants who were referred by their physicians or who responded to the other recruitment efforts were scheduled for an initial screening visit with a Spanish-speaking research assistant. Initially, the participant recruitment and screening interviews were conducted by two Spanish-speaking individuals, one of whom was of Hispanic/Latino origin and one who was not. Due to our perception that potential participants were uncomfortable speaking to the non-Latino research assistant, during a later stage of the study, another Spanish-speaking research assistant of Hispanic/Latino origin joined the study.

During the screening visit, eligibility criteria were assessed. All eligible participants provided written informed consent appropriate for the expected educational level of the target population. Accordingly, the consent form was written at a 6th-grade literacy level. Additionally, the research assistant read the consent form to the participant if necessary. The consent form and all study materials were translated from Spanish to English then back to Spanish to ensure that accurate information was communicated.

Intervention

Intervention development—The intervention was developed based on approaches previously used successfully with primarily non-Hispanic/Latino adults in the PREMIER (Appel *et al.* 2003), Weight Loss Maintenance (Svetkey *et al.* 2008), and the Hypertension Improvement Project trials (Svetkey *et al.* 2009), with cultural adaptation and translation to Spanish. The intervention was based on principles derived from social cognitive theory (Bandura 1986) and techniques of behavioral self-management (Watson 1989) and was constructed using the trans-theoretical, or stages-of-change, model (Prochaska and DiClemente 1983, Bock *et al.* 2001) and motivational enhancement approaches (Miller and Rollnick 1991, Emmons and Rollnick 2001, Rollnick *et al.* 1999). These approaches emphasize the importance of the individual's ability to regulate behavior by setting goals, developing specific behavior change plans, monitoring progress towards the goals, and attaining skills necessary to reach the goals. The trans-theoretical model recognizes that behavior change is a dynamic process of moving through different motivational stages of readiness for change.

The intervention also incorporated aspects of motivational interviewing, a client-centered, directive therapeutic style to enhance readiness for change by helping the client explore and resolve ambivalence (Emmons and Rollnick 2001). The interventionist was trained in motivational interviewing, and this approach was incorporated into each group session.

Cultural adaptation

Cultural adaptation of the intervention was accomplished by incorporating traditional Hispanic/Latino food names from each country in Latin America so that the material could be used with people from different Hispanic/Latino backgrounds including those from Mexico, Honduras, El Salvador, Guatemala, Argentina, Colombia, and others, adapting recipes to those commonly used by Hispanics/Latinos, and using physical activities that are traditional within the Hispanic/Latino culture, such as dancing. During intervention sessions, cultural adaptation was ensured by the interventionist's personal familiarity with Hispanic/Latino culture. That is, the interventionist was herself Latina and was therefore familiar with the cultural context of the participants (e.g., typical roles of men and women in Hispanic/Latino families). In addition, cultural adaptation included knowledge and sensitivity to cultural differences among Hispanics/Latinos of different national origin.

Conduct and content of the intervention

The intervention consisted of 6 weekly group sessions lasting 90 to 120 minutes. Two separate groups of participants were assembled and met on different days and times (Tuesday PM and Friday AM) to accommodate differences in participants' availability. Both groups received the same intervention. The morning group met at ECH and the evening group met at LCHC.

The weekly sessions started with measuring each participant's weight and recording attendance. Throughout the sessions, motivational interviewing techniques were used to encourage participants to identify areas of their own daily life that needed attention in order to incorporate changes to their lifestyle. In addition, each participant set his/her own personal goals and action plans. At the end of each session, participants were provided with weekly food and physical activity diaries. Participants were encouraged to self-monitor their daily intake

of fruits, vegetables, dairy products, and fat, and to record their daily physical activity in minutes. They were given a Food and Fitness Guide (F&F guide) to facilitate self-monitoring. During the next session, participants received feedback on their self-monitoring. Every other week, a recipe demonstration was conducted with modified recipes from the regular Hispanic/Latino diet. On the alternate week, approximately 20 minutes of moderate exercise was incorporated into the weekly session to facilitate increased physical activity, but participants were encouraged to exercise at other times as well. The outline for each session is provided in Table 1. There were no make-up sessions or supplemental materials for participants who missed a session. Both intervention groups were led by a female nutritionist (P R-G) who is a native Spanish speaker from Colombia (South America) with training in the principles of motivational interviewing. The interventionist had experience working with hypertensive patients for almost twenty years, and four years experience using the DASH dietary pattern in the Durham Hispanic/Latino community.

Process evaluation

After completing the 6 week intervention, participants were asked to complete an evaluation consisting of fifteen multiple choice and open-ended questions including questions like: Do you think that the weight loss sessions help you improved your blood pressure? Please tell me what parts of the sessions were more useful for you. How often did you use the diary? These data were summarized qualitatively without formal statistical analysis.

Physiologic, dietary, and exercise measurements

Participants completed baseline measurements and a demographic questionnaire. At each study visit (baseline, each intervention session, and 6 weeks), body weight was measured in light indoor clothes without shoes to the nearest 0.1 kg using a high-quality digital scale, and height (baseline) was measured using a wall-mounted stadiometer and recorded to the nearest 0.1 cm. Body Mass Index (BMI) was then calculated as the Quetelet Index, defined as weight divided by height squared (kg/m^2). Blood pressure, measured at baseline and 6 weeks, was obtained from the right arm with an appropriate sized cuff after participants were seated quietly for 5 minutes. We obtained a total of three blood pressure measurements with 30 seconds rest in between; the average of the second and third readings was then calculated.

In addition, participants were instructed to record their daily physical activity (min/day) and intake of fruits, vegetables, dairy products, and fat (servings/day) in a weekly (seven days) diet and physical activity diary based on previously published studies using a similar intervention (Appel *et al.* 2003, Svetkey *et al.* 2008, Svetkey *et al.* 2009).

Analysis

We report baseline and follow-up means and standard deviations for systolic blood pressure, weight, BMI, vegetable intake (servings/day), dairy products (servings/day), and fat (servings/day). The distributions of physical activity (minutes/week) and fruits (servings/day) were non normal at baseline. Therefore, we report medians and inter-quartile ranges for these variables. In addition, because the modest sample size did not provide sufficient power for performing inferential statistics, we calculated the standardized difference between means (Cohen's *d*) to indicate the effect size, or the magnitude of the treatment effect. This statistic can be used in within-subject designs, and the effect sizes are not influenced by sample size the way significance levels (*p* values) are. Cohen has suggested that *d*'s of 0.20, 0.50, and 0.80 represent small, medium, and large effect sizes, respectively (Cohen 1992). Subjects with missing data were excluded from the analysis. Statistical analyses were performed using SPSS version 15.0.

RESULTS

Recruitment, attendance, and retention

A total of 64 individuals were initially identified from our recruitment efforts as interested in participating. Of these, 33% were referrals from health care providers, 23% from printed media, and 44% from direct contact. Nine individuals (5 men and 4 women) could not be contacted for scheduling the screening visit. During the initial phase of the study, recruitment and interviews conducted by the non-Hispanic Spanish-speaking research assistant were not as effective as expected, and improved with the addition of a Hispanic/Latino assistant. Although no formal evaluation of the effect of the Latina recruiter was conducted, our impression was that the recruitment rates improved subsequently. Of 11 volunteers, 5 were successfully contacted by the non-Hispanic/Latino recruiter, of whom 1 enrolled, compared to 19 volunteers assigned to the Hispanic/Latino recruiter, of whom 18 were contacted and 14 enrolled. Of the 55 subjects contacted to participate, 29 did not participate (7 men and 22 women), due to diverse reasons including lack of interest, not meeting inclusion criteria, and barriers such as inability to participate due to work hours. For women, the main reasons for non-participation included the lack of transportation and child care. Twenty-six subjects were enrolled. Nineteen completed the intervention, but due to missing data, analyses are based on the 17 subjects with complete measurements at the beginning and end of intervention. The average attendance was 5 ± 1.1 (mean $\pm$ SD) out of a total of 6 sessions. Eight of the subjects attended all 6 sessions, 5 attended five sessions; 2 attended four sessions, 1 attended three sessions, and 1 attended two sessions. Of the 17 participants for whom there were complete data, 10 were female and 7 were male. Based on informal discussion with the interventionist, we understand that most participants were from Mexico. However, since no specific question regarding country of origin was asked during data collection, we cannot report the distribution of country of origin. Participants were, on average, 46 years old (range 33 to 70), and 4 had an educational level of 6th grade or less, 4 less than high school, and 8 had some vocational education, some college or completed college. (Table 2)

Process evaluation

All participants “strongly agreed” or “agreed” that the group sessions helped them to lose weight and control their blood pressure. Participants also reported that it is “very likely” that they will continue practicing what they learned during the sessions, and that they would advise their relatives and friends to participate in a similar program. The participants commented that the topics that helped the most were learning about exercise, portions (the amount one chooses to eat) and servings (a unit of measurement), the DASH dietary pattern, avoiding negative thoughts (add in triggers and cravings), how to manage their meals such as planning their meals ahead of time, and facts about calories and nutrition. Also, participants commented that keeping the food and exercise diary was helpful. Filling out the food and exercise diary was difficult for some of them (5) and easy or very easy for half of them (8). Fourteen used the diary “frequently”, and 3 participants used it sporadically or occasionally. Participants commented that the group support was very important to them and that the sessions were clear and well-planned. The participants suggested that we continue providing this intervention, but that we add more exercise sessions, include more vegetarian recipes, and extend the number of sessions offered.

Physiologic, dietary, and exercise measurements

Systolic BP was reduced an average of 10.4 ± 10.6 mmHg, corresponding to a d value of 1.01 (large effect size.) (Cohen 1992) The average baseline weight was 196.4 ± 44.5 lbs, and average BMI was 34 ± 5.4 kg/m². As shown in the Table 3, participants improved on every outcome except fat intake. The largest impact on behavior-related variables was seen for change in

weight ($d=0.49$) and exercise ($d=0.68$), corresponding to medium-large effect sizes (Cohen 1992).

DISCUSSION

Results of this small pilot study indicate that it is feasible to implement behavioral lifestyle interventions for lowering BP in Hispanic/Latino adults. Kumanyika suggests that a successful culturally adapted intervention needs to include study personnel from the same background and that intervention encounters need to be conducted at a location in the community (Kumanyika *et al.* 1991). Our results are consistent with these recommendations. For example, employing staff from the same ethnic group of the target population seemed to improve our recruitment. Our pilot study was conducted in collaboration with institutions familiar to the Hispanic/Latino population, with direct collaboration with physicians and health care providers working closely with this specific patient population, and all study and intervention session were held at ECH and LCHC. These factors may account for the strongly positive qualitative response and substantial behavior (and blood pressure) changes we observed. One potential explanation for this finding is that participants from minority groups might feel more comfortable agreeing to participate in clinical research when they perceive that the study is conducted by individuals familiar with their culture and by individuals that they can trust. The importance of having study personnel from the same background as the participants is further demonstrated by the fact that during the initial recruitment phase for this pilot study, screening visits were scheduled by a non-Hispanic/Latino research assistant who was fluent in Spanish, and we experienced a high no-response rate. Attendance at the initial screening sessions subsequently improved when we had a native Spanish-speaking Hispanic/Latino research assistant scheduling and conducting screening visits. While this difference could possibly be due to individual rather than ethnic differences, both assistants were experienced, well-trained, and had excellent interpersonal skills.

Some methods that we have used successfully to recruit other non-Hispanic/Latino segments of our population were not as effective in this group. For example, posting flyers in public locations did not result in the large number of inquiries we had experienced previously. We suspect that lack of familiarity with the study organization (Duke University Medical Center) and with academic medical centers in general may have limited the utility of this recruitment method. In contrast, recruitment of Hispanics/Latinos was facilitated by utilizing direct referral from health care providers, direct contact during Hispanic/Latino events, and by advertising in Hispanic/Latino newspapers and businesses.

Another important finding of this study is the fact that most participants felt that they were likely to change their behavior based on what they learned during the intervention. This response suggests that Hispanics/Latinos are interested in learning to prevent and treat their medical conditions through lifestyle changes. Although Hispanics/Latinos have been previously underrepresented in this type of research (Appel *et al.* 2003 a, Cook *et al.* 2007), our findings suggest that behavior intervention trials can be successful in this population.

Most importantly, our results also suggest that a culturally adapted intervention is potentially effective in Hispanics/Latinos, as indicated by the improvement in blood pressure, weight, and dietary pattern. Reversing prior underrepresentation of Hispanics/Latinos by targeting this group in future research is likely to yield clinical and public health benefits.

This pilot study had a number of limitations. First, the study is short-term, has a small sample size, and effects are measured as within-subject changes rather than comparing effects to a control group. Given the goals of this pilot study, i.e., to gather preliminary evidence of the feasibility and the effectiveness of the intervention, and the fact that there is very little research

on intensive, group-based behavioral intervention for blood pressure control in Hispanic/Latinos (Lindberg and Stevens, 2007), the design allow reasonable conclusions that establish rationale for a larger, longer, pilot trial. Second, the theoretical basis of the intervention has not been validated in the Hispanic/Latino population. However, there is no *a priori* rationale for expecting fundamental principles of behavior to differ by ethnicity. Third, this study was not designed to assess the feasibility of implementing the intervention on a larger scale outside of the research context, which ultimately may require even greater collaboration with grassroots organizations and community health centers than we achieved. Nonetheless, our results suggest that the approach used in other trials will apply to the Hispanic/Latino community: attendance, adherence, and weight loss were consistent with previous investigations of lifestyle intervention for improving blood pressure control (Conlin *et al.* 2000, Stevens *et al.* 2001, Svetkey *et al.* 2008, Elmer *et al.* 2006) and study participants on average had a clinically significant decrease in systolic blood pressure of 10.4 ± 10.6 mmHg.

KEY MESSAGE

This pilot study, designed to test the feasibility of a culturally tailored behavioral intervention aimed at improving hypertension-related health behaviors in Hispanic/Latino adults, suggests that research on lifestyle interventions for preventing and treating hypertension is feasible and potentially effective in the Hispanic/Latino population. Key lessons learned include 1) use of staff and investigators who are familiar with (ideally from) the Latino culture; 2) recognizing cultural differences among Latinos of different national origin; 3) using individuals and organizations that are familiar and trusted to facilitate recruitment; 4) focusing intervention on key foods and using food names that are familiar to the participants; and 5) incorporating physical activity into the intervention. In addition, despite the low literacy level of the study participants, simplified self-monitoring diaries, a critical component of prior behavioral interventions, were considered helpful by participants. Given the dearth of evidence in this important and growing segment of the population, the next research step should be gathering additional pilot data in a larger group with a longer period of intervention and follow up, incorporating the lessons learned in this small initial pilot study. Ultimately, these findings should lead to a large-scale randomized trial designed to establish the effectiveness of behavioral lifestyle intervention for preventing and controlling hypertension in Latinos.

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Table 1
Outline for each intervention session

SESSION/TOPICS	DESCRIPTION
Session 1 Introduction	General introduction to the sessions
DASH eating plan	DASH goals (servings of fruits, vegetables, low fat dairy, etc per day)
Fruits and vegetables	How to increase the servings of fruits and vegetables
Low-fat dairy (LFD)	What counts as a LFD. How to eat LFD with lactose intolerance
Servings	Formal definition of servings and the difference with a portion
Record keeping	How to record food and exercise in the food diary
Taste it	Demonstration of preparation and tasting of DASH recipes
Session 2 Calories/Food labels (distribute the Food & Fitness Guide)	How to read a food label. Distribution of the food and fitness guide
Physical activity (Exercise)	How to start an exercise plan
What counts	What kind of physical activity counts as exercise (walking from the parking garage vs. taking a walk)
Exertion level	What is moderate intensity physical activity
Hydration	How much water we need per day.
Benefits of physical activity	Such as weight loss, improve in blood pressure, increase of energy level, etc.
Group exercise	20 minutes of moderate physical activity
Finding time for physical activity (goal setting)	How to establish a time for daily exercise.
Session 3 Ask the doctor	How to talk with your doctor about your blood pressure. E.g. what is my blood pressure goal?
Hypertension	What is hypertension
Medication	How to take the medications
Conscious eating	How to make sure we eat when we are hungry and how to avoid distractions while we eat
Taste It	Demonstration of preparation and tasting of DASH recipes
Short term goals	How to establish a short term goal
Stages of change (Lapse, relapse, collapse)	Description of each state of change
Session 4 Portions versus Servings	Difference between a portion (the amount one chooses to eat) and a serving (a unit of measurement)
Dining out	How to eat healthy while eating out

SESSION/TOPICS	DESCRIPTION
Estimation of servings	What is an actual serving.
Group exercise	20 minutes of moderate physical activity
Facts about sodium (Salt)	How much sodium do we need. How sodium affects the blood pressure
Special occasions/vacations	How to plan prior to special event in order to avoid eating more than necessary
Session 5 Meal management	How to plan meals ahead of time
Planning ahead	How to plan you meal menu. How to plan your daily physical activity
Buying food	How to make decision regarding how much food to buy, etc
Preparing food	How to prepare healthier versions of our favorite foods
Time management/organization (add in stress)	How to organize our time
My time my values/contract	What are my values. How much time I spend in each of my daily activities
Taste It	Demonstration of preparation and tasting of DASH recipes
Session 6 Social support/family support	How to get support from family in order to achieve our goals
Negative thoughts (add in triggers and cravings)	How do negative thoughts affect our health and stress level. How to change negative thoughts to positive thoughts
Weekly check in	How to maintain your goals. How to do a weekly check in to stay on track
Commitment to healthy living	Signing a personal contract in order to commit to a healthier life style
Celebrating your accomplishments	The facilitator congratulates each participant for completing the intervention and provides tools on how to set goals after the program is completed

Table 2
Baseline Characteristics by Gender (N=17). Values represent means and SD unless otherwise noted

Variable	Total (N=17)	Women (N= 10)	Men (N=7)
Age-yr [†]	46 ± 8.4	46 ± 9.9	46.1 ± 6.3
Height.-m	1.6 ± 0.09	1.5± 0.07	1.6 ± 0.07

Education- no. *			
0 to 6 grade	4	0	4
7 to 9 grade	2	2	0
10 to 12 grade	2	2	0
Vocational	2	1	1
Some college	3	3	0
College	3	1	2

Note:

* Totals may not equal total sample size due to missing data.

Table 3
Outcome measures at baseline and follow up overall and by sex. N =17. Values represent means and SD unless otherwise noted

Outcome	Baseline	6-Week Follow-up	Difference*	d
Weight (lb.)	196.4 (44.5)	194.8 (45.0)	-1.5 (3.2)	.49
Men	201.6 (43.9)	198.7 (45.9)	-2.9 (4.3)	.73
Women	192.7 (46.9)	192.1 (46.6)	-0.6 (2.0)	.31
BMI	34.0 (5.4)	33.7 (5.6)	-0.3 (0.5)	.52
Men	31.8 (4.6)	31.4 (4.8)	-0.5 (0.6)	.82
Women	35.4 (5.7)	35.3 (5.7)	-0.1 (0.4)	.29
Vegetables(servings/day)	1.8 (2.3)	2.0 (1.5)	0.4 (1.9)	.25
Men	1.0 (0.9)	1.5 (0.6)	0.5 (0.9)	.64
Women	2.5 (3.0)	2.4(1.9)	0.2 (2.6)	.09
Dairy (servings/day)	1.2 (0.8)	1.4 (1.0)	0.3 (1.0)	.31
Men	1.0 (0.8)	1.4 (0.9)	0.5 (1.2)	.42
Women	1.3 (0.7)	1.3 (1.1)	0.2 (0.9)	.20
Fat (servings/day)	0.6 (0.8)	0.7 (0.7)	0.2 (0.7)	.27
Men	0.3 (0.7)	0.5 (0.7)	0.2 (0.6)	.32
Women	0.8 (0.8)	0.9 (0.7)	0.2 (0.7)	.25
Fruits (servings/day), median (IQR)	1.7 (1.5)	1.9 (2.2)	0.0 (2.3)	.06
Men	2.0 (1.5)	1.1 (2.0)	0.1 (3.1)	.12
Women	1.5 (3.8)	2.0 (2.4)	-0.1 (2.5)	.17
Exercise(min/week), median (IQR)	20.0 (100.0)	102.5 (166.3)	40.0 (115.0)	.68
Men	20.0 (85.0)	150.0 (160.0)	91.0 (71.0)	1.44
Women	45.0 (103.8)	90.0 (127.5)	-6.0 (88.8)	.23
Systolic Blood Pressure (mmHg)	124.9 (10.4)	114.5 (10.5)	-10.4 (10.6)	1.01
Men	125.9 (10.1)	114.3 (8.2)	-11.6 (11.8)	1.07
Women	124.2 (11.2)	114.7 (12.3)	-9.5 (10.3)	.97
Diastolic Blood Pressure (mmHg)	79 (11.5)	70 (9.0)	-9.0 (13.00)	
Men	82.1 (10.8)	71.2 (7.9)	-10.9 (9.4)	1.25
Women	74.8 (6.3)	69.7 (10.8)	-5.1 (8.5)	.63

Note. IQR=interquartile range; *d*=standardized difference between means. Subtracting baseline from follow-up scores may not yield the difference score due to rounding.

* Negative difference score indicates decrease from baseline to follow-up.