Research Article

Hispanic Community Engagement (HCE): Pilot Study to Reduce Hypertension among Low-Income Mexican Americans

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Abstract

Background: Mexican American adults have a lower prevalence of hypertension and hypertension-related mortality rates compared to other ethnic groups. However, they are more likely to be unaware of their condition, lack access to care, and have uncontrolled blood pressure.

The Hispanic Community Engagement (HCE): Hypertension pilot study aimed to test the efficacy of a case management and educational intervention. The goal of the intervention was to improve adherence to recommended hypertension treatment plans and improve overall health status of Hispanic/Latinos with hypertension.

Methods: Hispanic/Latino patients with hypertension were randomly recruited from a federally qualified health center to participate in the 16-week intervention. Group health education focused on hypertension, healthy eating, physical activity, and living healthy. Case management phone calls were tailored to participant needs and topics included problem solving, review of goals and progress, and community resources. Data collection included fasting blood draws, anthropometric measurements, pre-post- intervention surveys, and post intervention focus groups. Pre-post surveys assessed changes in eating habits, physical activity, and adherence to treatment plans. Focus group questions focused on benefits from participating in the study as well as recommendations for modifications for future research.

Results: A total of 53 patients participated. Pre- post- data analysis demonstrated significant improvements in participant health status by improving total cholesterol, Low-density lipoprotein cholesterol, High-density lipoprotein cholesterol, and triglycerides levels (p ≤ .05). At post intervention, participants showed significant increases in adherence to their treatment plan of hypertension drugs and concern for their health status (p ≤ .05). Participants also demonstrated significant decreases in salt intake (p ≤ .05).

Conclusion: Results demonstrate the effectiveness of tailored interventions as well providing patients with guidance and support to carry out lifestyle changes. Further research is needed to determine the effectiveness of interventions aimed at producing long-term changes for Hispanic/Latino adults with hypertension.

Introduction

Hypertension is a modifiable risk factor for heart disease and stroke and is a major cause of premature death and disability due to cardiovascular and cerebrovascular complications [1,2]. Hypertension is a chronic medical condition in which blood pressure is elevated above a specified range of healthy levels (standardized at 140/90 mm of hg) [3]. Despite public health efforts to increase screening and management of hypertension [4] as well as the availability of effective pharmacological and non-pharmacological treatment regiments (e.g., low sodium diet, exercise), hypertension remains a major public health problem in the U.S. [5,6]. Racial and ethnic minority groups are at increased risk for health complications due to lack of awareness, treatment and control of hypertension [7,8]. According to the Hispanic Community Health Study / Study of Latinos (HCHS/SOL), a longitudinal cohort study of 16,415 Hispanic/Latino (H/L) adults in the U.S., the age adjusted prevalence of hypertension for H/L men was 26.1% and 25.3% for H/L women [9]. National data from 2011-2012, showed that the age-adjusted hypertension prevalence for Mexican American adult women 20 years and older was 27.0%, while the rate for Mexican American men was 26.6% [10]. The prevalence of uncontrolled hypertension among individuals of Mexican heritage must be addressed given that Mexicans comprise the largest percentage of H/Ls (over 60%) in the U.S. [11,12].

Mexican adults with hypertension are more likely to be unaware of their condition, lack access to care, have uncontrolled blood pressure, and are less likely to effectively manage their

hypertension compared to other racial and ethnic groups [7,13-17]. According to national data, Mexican American adults are least likely to be aware of having high blood pressure, report receiving treatment, and report having their blood pressure under control when compared to non-Hispanic Blacks [7]. Data from the Multi-Ethnic Study of Atherosclerosis (MESA) showed that H/Ls (32%) were more likely than non-Hispanic whites (24%) to have treated but uncontrolled hypertension [13]. Similarly, data from San Ysidro Health Center, Inc., a Federally Qualified Health Center (FQHC) providing primary care services to underserved populations, the majority of Mexican descent (82%) in San Diego County, show that in 2014, 33% of patients were receiving treatment but had uncontrolled blood pressure [18].

There are many individual and health system-level risk factors that contribute to poor hypertension control among H/Ls. Individual level factors include older age, low socio-economic status and education, language barriers, and degree of acculturation [12,19,20]. Beliefs about causes and consequences of hypertension may also place H/Ls at risk for uncontrolled hypertension (e.g., misconceptions about the use or value of medicine) or feelings of fatalism, the belief that health outcomes are influenced by fate, which can result in refusing to seek care [21,22]. Lifestyle related factors include dietary patterns, greater weight, insufficient physical activity, sleep apnea, and poor adherence to antihypertensive medications [23,24]. Chronic stress may also play a role in the prevalence of hypertension among racial and ethnic minorities [25]. The HCHS/SOL found that chronic stress burden was related to a higher prevalence of diabetes and hypertension among H/Ls [26]. Lack of social support from family and providers, lack of health care access, lack of patient-centered and culturally appropriate services also contribute to the high rates of uncontrolled hypertension among H/Ls [27]. Further, ethnic-based disparities in the receipt of hypertension treatment exist. For example, one study among 1,205 patients with hypertension related outpatient visits to 12 general internal medicine clinics showed that H/Ls (71.5%) were less likely than non-Hispanic blacks (81.9 %) and non-Hispanic whites (80.3%) to receive aggressive hypertension treatment [3].

Although hypertension and its complications are life threatening, this condition can be controlled through certain medications [28,29] and lifestyle changes, (e.g., maintaining a healthy weight and smoking cessation) [3,30,31]. Specifically, dietary changes such as reducing sodium intake and following the Dietary Approaches to Stop Hypertension (DASH) diet, which emphasizes diets rich in vegetables and fruits, and low-fat dairy products has been found to reduce systolic blood pressure [27]. Increasing physical activity can also be beneficial. According to the National Heart, Lung, and Blood Institute, a 5% weight loss can help reduce both systolic and diastolic blood pressure [32]. Normal blood pressure for adults is defined as a systolic pressure below 120 mmHg and a diastolic pressure below 80 mmHg. Systolic Blood Pressure (SBP) is blood pressure when the heart beats while pumping blood, while Diastolic Blood Pressure (DBP) is blood pressure when the heart is at rest between beats [33].

To effectively address disparities in hypertension control among Mexicans, public health programs need to be culturally and linguistically tailored and include different strategies to assist with the multi-level factors faced by this population [34]. Engaging community members in design and implementation of interventions is another

effective strategy [35,36]. Based on a recent literature review, there are a limited number of interventions that target hypertension among H/Ls. To bridge this gap, the Hispanic Community Engagement (HCE): Hypertension project developed and implemented a pilot intervention to test the efficacy of a clinic-based intervention targeting barriers to hypertension control and medication adherence. The overall goal was to improve adherence to physician recommended hypertension treatment plans and overall health status. We hypothesized that study participants would show an improvement in health status, medication adherence, and positive health behaviors from pre- to post intervention assessment.

Materials and Methods

Participants

Participants were registered patients of San Ysdiro Health Center, Inc. (SYHC), a federally qualified health center in San Diego County. The project case manager performed search queries using the electronic data system to identify eligible patients. Patients were eligible if they: 1) were aged 40 years or older, 2) had a clinic visit within the past 12 months, thus indicating active patient status, 3) had a diagnosis of hypertension, and 4) were free of other chronic diseases requiring medications. Patients were excluded if they: 1) had a severe health complication that may prevent participation in the study, 2) had plans to move out of the area in the next six months, and 3) were enrolled in another hypertension study. Spanish invitation letters, signed by the patient's primary care provider, were mailed to 241 patients who satisfied the eligibility criteria. A follow-up phone call from the project case manager was then made to each eligible patient to confirm receipt of the letter and to provide study information. Of those eligible, 53 individuals participated. The remaining were either no longer living at the address of record, moved out of the clinic service area, or refused to participate due to lack of time, spousal support, childcare, or transportation.

Intervention Description

The 16-week intervention consisted of case management tailored to the participant's behavioral change goals coupled with four education workshops. The health education workshops were held at SYHC, during Weeks 4-7, lasted approximately two hours and were conducted by trained bilingual health educators from the target community. For optimal teacher-learner ratio, the educational sessions were conducted in a series of five waves, with groups that ranged from 8 to 13 members per group.

The tailored case management phone-based sessions were conducted semi-monthly during Weeks 8-12 across the first five weeks after the intervention workshops and then monthly during Weeks 13-16. The case manager was previously trained in assessing blood pressure, and height/weight measurements. The National Alliance for Hispanic Health Alliance offered a 'train-the-trainer' session for the case manager, which included dissemination of a training manual, reading materials, and a PowerPoint presentation to conduct the educational sessions. Supplemental reading material related to hypertension was obtained from the American Heart Association, Medline Plus, and the Centers for Disease Control and Prevention. Table 1 provides an outline of the group health education session topics and components as well as case management call topics.

Table 1: Intervention Overview.

Group health education sessions		
Topics per week	**Session components**	
1: Hypertension Overview	Blood pressure	
	Risk factors	
	Causes and symptoms	
	Measurements and diagnostics	
	Consequences of hypertension	
	Treatment and control	
2: Hypertension and healthy eating	Eating healthy	
	Nutrients in food	
	Healthy food choices	
	Healthy eating principles	
3: Hypertension and physical activity	Benefits of physical activity	
	Relation to healthy eating	
	Energy balance	
	Active lifestyles	
	Types of physical activity	
	Time and intensity	
	Safe walking places	
4: Living healthy	Reducing sodium intake	
	Staying physically active	
	Quitting smoking	
	Limiting alcohol consumption	
	Reducing stress	
Case management phone calls Call topics (tailored to participant's needs)	Confirmed participant's goals and progress towards meeting physical activity and diet goals	
	Problem solving to address barriers	
	Suggestions and encouragement	
	Information regarding nearby community resources	

Measures

Pre and post- intervention data were collected during scheduled visits with a case manager at the clinic. Anthropometric measurements included height, weight, blood pressure, measurements of participant's abdomen, and hip and waist circumferences. A fasting blood draw was taken to assess full lipid panel and complete blood count. A self-report questionnaire was administered pre- and post-intervention. The pre-intervention questionnaire included items regarding demographics (age, gender, years in the US, income, education) and items to assess social support, eating habits, physical activity, and adherence. The post-intervention questionnaire included items to assess change in social support, eating habits, physical activity, and adherence. All question answer options responses ranged from 1-5 (e.g., where 1= not at all and 5= a great deal). At the onset of the pre-intervention baseline visit, patients were consented using San Diego State University Institutional Review Board approved methods and were subsequently scheduled for the group health education intervention component. Post-intervention assessments took place four months after the baseline visit.

Quantitative Data Analysis

Adherence to recommended treatment plan was measured by items using the study questionnaires and overall health status was measured through the clinical assessment of anthropometrics, and fasting blood draw. The data were analyzed using SPSS version 19. A series of bivariate analyses (e.g., chi-square tests and t-tests) were used to test the proposed hypotheses and to compare pre- to post-intervention health status, adherence, and health behaviors.

Focus Group Methodology and Analysis

In order to get feedback on the intervention's cultural-appropriateness, and to gain insight on ways to improve the intervention, a focus group was held after the four education classes using SDSU approved methods with a moderator of similar cultural background [37]. Participants were asked to provide feedback on intervention components, including the understandability, utility, and benefit of the health education workshops; dissemination of information learned; motivation to participate in workshops; and feedback on the program educational materials.

Table 2: Participant Sociodemographic Characteristics.

Mean Scores	Baseline Only (n=53) M (SD)	Baseline + Program End (n=39) M (SD)
Age	M= 53.2 (SD=8.8, n=53) (Range: 39.9-82.5)	M=52.9 (SD=6.5, n=39) (Range: 39.9-74.0)
Years resided in the United States	M=22.4 (SD=11.9, n=52) (Range: 2.0- 46.0)	M=22.2 (SD=12.7, n=39) (Range: 2.0- 46.0)
Average number of Alliance classes attended	M= 2.1 (SD=1.8, n=53)	M=2.6 (SD=1.8, n=39)
In your opinion, how well do you understand spoken English?[1]	M=2.8 (SD= .9, n=52)	M=3.0 (SD=.8, n = 39)
In your opinion, how well do you speak English?[1]	M=3.1 (SD=.9, n=52)	M=3.3 (SD=.8, n = 39)
In your opinion, how well do you read English?[1]	M=3.0 (SD=.9, n=52)	M=3.1 (SD=.8, n = 39)
What language do you usually use, with your spouse/partner?[2]	M=4.6 (SD=.7, n=44)	M=4.6 (SD=.6, n=35)
What language do you usually use with your children?[2]	M=4.4 (SD=1.1, n=47)	M=4.5 (SD=1.1, n=35)
Categorical Variables	**Baseline Only (n=53) % (n)**	**Baseline + Program End (n=39) % (n)**
# of NAHH classes attended		
0	37.7 (20)	25.6 (10)
1	9.4 (5)	7.7 (3)
2	3.8 (2)	0.0 (0)
3	7.5 (4)	10.3 (4)
4	41.5 (22)	56.4 (22)
Total	100.0 (53)	100.0 (39)
Gender		
Men	32.1 (17)	25.6 (10)
Women	67.9 (36)	74.4 (29)
Total	100.0 (53)	100.0 (39)
Ethnicity		
Mexican or Mexican descent	94.2 (49)	94.9 (37)
Central American or Central American descent	3.8 (2)	5.1 (2)
South American or South American descent	1.9 (1)	0.0 (0)
Total	100.0 (52)	100.0 (39)
Highest educational level		
Elementary/primary (1-5 grades)	28.8 (15)	25.6 (10)
Middle school/ junior high (6-8 grades)	26.9 (14)	33.3 (13)
High school/preparatory school	26.9 (14)	30.8 (12)
Trade school/vocational school	9.6 (5)	7.7 (3)
University/college	7.7 (4)	2.6 (1)
Total	100.0 (52)	100.0 (39)
Categorical Variables	**Baseline Only (n=53) % (n)**	**Baseline + Program End (n=39) % (n)**
Total household annual income		
< $10,000	46.2 (24)	48.7 (19)
$10,001-15,000	28.8 (15)	30.8 (12)
$15,001-20,000	11.5 (6)	7.7 (3)
$20,001-25,000	1.9 (1)	0.0 (0)
$25,001-29,999	1.9 (1)	2.6 (1)
$30,000-40,000	7.7 (4)	7.7 (3)
$50,001-75,000	1.9 (1)	2.6 (1)
Total	100.9 (52)	100.0 (39)
Employment status		
Employed for wages	26.9 (14)	25.6 (10)
Self-employed	5.8 (3)	5.1 (2)
Out of work > 1 year	11.5 (6)	12.8 (5)
Out of work < 1 year	19.2 (10)	15.4 (6)
A fulltime homemaker	13.5 (7)	17.9 (7)
Retired	3.8 (2)	5.1 (2)
Unable to work	15.4 (8)	15.4 (6)
Out of work > 1 year and a full-time homemaker	3.8 (2)	2.6 (1)
Total	100.0 (52)	100.0 (39)

The case manager randomly identified and contacted 20 participants who originally consented to participate in the intervention. A total of 13 participated in the 90-minute audio-taped focus groups; for their time, participants received light refreshments and a $20.00 grocery voucher. The Spanish language focus group transcripts were translated using standard back-translation techniques. Two researchers independently coded the transcript and clustered the comments into themes. A framework explaining the emergent themes from the focus groups was developed to provide recommendations for subsequent changes to the pilot intervention.

Results

Sample Description

The educational sessions were conducted with 5 cohorts, initially ranging from 8 to 13 participants. Cohort retention varied (cohort A: 5/9 = 55.0% retention; B: 7/13= 53.8%; C: 10/12= 83.3%; D: 10/11= 90.9%; and E: 7/8= 87.5%); however, retention rates did not

significantly differ. At baseline and follow-up, cohorts A through E did not significantly differ in their socio-demographic characteristics (i.e., age, gender, ethnicity, education and income) or in the number of classes attended; therefore, separate pre- and post- test analyses were not conducted by group membership.

A total of 39 (73.5%, 39/53) individuals participated in both baseline and follow-up measurements. These 39 individuals had an average age of 52.9 years (SD = 6.5), resided in the United States for an average of 22.2 years (SD = 12.7), were mostly women (74.4%), of Mexican descent (94.6%), spoke mostly Spanish with their spouse (M=4.6, SD=.7) and their children (M=4.4, SD=1.1). The majority had an annual household income of less than $15,000 (79.5%), and only 30.7% were employed (Table 2).

Changes in Health Status

Participants showed pre to post intervention improvement for total cholesterol, Low-Density Lipoprotein (LDL), High-Density Lipoprotein (HDL), and triglycerides. The percentage with normal

Table 3: Change in Health Status (Pre- and Post- Intervention).

Categorical	Baseline (n=39) % (n)	Program End (n=39) % (n)	Significance
Systolic blood pressure			
Normal (< 120)	20.5 (8)	20.5 (8)	$\chi^2 (4, 39) = 10.801$
High (120-139)	64.1 (5)	28.2 (11)	(p = .029)
Alert (≥ 140)	15.4 (6)	51.3 (20)	
Total	100.0 (39)	100.0 (39)	
Diastolic blood pressure			
Normal (< 80)	20.5 (8)	46.2 (18)	$\chi^2 (4, 39) = 5.113$
High (80- 89)	41.0 (16)	25.6 (10)	(p = .276)
Alert (≥ 90)	38.5 (15)	28.2 (11)	
Total	100.0 (39)	100.0 (39)	
BMI Categories			
Normal (18.5-24.9)	11.1 (4)	8.3 (3)	$\chi^2 (4, 36) = 38.919$
Overweight (25-29.9)	47.2 (17)	36.1 (13)	(p = .000)
Obese (30+)	41.7 (15)	55.6 (20)	
Total	100.0 (36)	100.0 (36)	
Triglycerides			
Normal (< 150)	65.6 (21)	71.9 (23)	$\chi^2 (2, 32) = 16.900$
High (150- 499)	31.3 (10)	28.1 (9)	(p = .000)
Alert (≥ 500)	3.1 (1)	0.0 (0)	
Total	100.0 (32)	100.0 (32)	
Total cholesterol			
Normal (< 200)	31.3 (10)	46.9 (15)	$\chi^2 (1, 32) = 6.409$
High(≥ 240)	68.8 (22)	53.1 (17)	(p = .011)
Total	100.0 (32)	100.0 (32)	
HDL			
Low (< 40)	15.2 (5)	12.9 (4)	$\chi^2 (1, 31) = 23.881$
Normal (40-60)	83.9 (26)	87.1 (27)	(p = .000)
Total	100.0 (31)	100.0 (31)	
LDL			
Normal (< 100)	12.9 (4)	32.3 (10)	$\chi^2 (1, 31) = 3.839$
High (≥ 190)	87.1 (27)	67.7 (21)	(p = .050)
Total	100.0 (31)	100.0 (31)	
Mean Scores	**Baseline M (SD) (n=39)**	**Program End M (SD) (n=39)**	**Significance**
Systolic blood pressure	M=127.0 (SD=10.9, n=39)	M=139.3 (SD=21.6, n=39)	T = -3.706 (df = 38, p = .001)
Diastolic blood pressure	M=84.9 (SD=9.0, n=39)	M=80.9 (SD=10.8, n=39)	T = 2.135 (df = 38, p = .039)
BMI	M = 30.9 (SD=6.1, n=36)	M = 31.3 (SD=5.9, n = 36)	T = -1.104 (df = 35, p = .277)
Mean Scores	**Baseline M (SD) (n=39)**	**Program End M (SD) (n=39)**	**Significance**
Triglycerides	M= 132.1 (SD=54.0, n=31)	M=123.4 (SD=51.0, n=31)	T= 1.352 (df = 30, p = .187)
Total Cholesterol	M= 216.1 (SD=35.2, n= 32)	M=205.7 (SD=36.1, n=32)	T = 1.956 (df = 31, p = .060)
HDL	M=58.2 (SD=18.4, n=32)	M=57.9 (SD=16.9, n=32)	T = .223 (df = 31, p = .825)
LDL	M=143.8 (SD=80.7, n=32)	M=121.5 (SD=31.8, n=32)	T = 1.477 (df = 31, p = .150)

total cholesterol levels (< 200 mg/dL) significantly increased from baseline (31.3%) to follow-up (46.9%) (p ≤ .05). The percentage with normal triglycerides levels (< 150 mg/dL) significantly increased from baseline (65.6%) to follow-up (71.9%) (p ≤ .05). Finally, the percentage with normal HDL and LDL cholesterol levels (< 40 mg/dL; < 100 mg/dL respectively) significantly increased from baseline (83.9%; 12.9%) to follow-up (87.1%; 32.3%) (p ≤ .05) (Table 3).

There were no improvements for BMI since there was a significant decrease in the number of participants with a normal BMI level (11.1 % normal at baseline compared to 8.3% at follow-up) (p ≤ .05). There were also no improvements for SBP and DBP. The percentage of participants with hypertensive SBP and DBP levels (≥ 140; ≥ 90 respectively) increased from baseline (15.4%; 38.5%) to follow-up (51.3%; 28.2%) (p ≤ .05) (Table 3).

Changes in Health Behavior

Participants showed improvement in their reported adherence to their treatment plan of hypertension drugs from pre- to post-intervention. When asked, 'What percent of your high blood pressure medication did you take in the last month?' the average participant response was 84.3% at baseline, which significantly improved to 97.8% at follow-up (p ≤ .05) (Table 4).

Participants were asked several questions about their health behaviors at pre- and post- intervention. When asked, 'In the last 3

months, did you share healthy low-fat recipes or foods with family or friends?' participants were more likely to respond favorably at follow-up (M=3.7) compared to baseline (M=3.0) (p ≤ .05). Participants responded significantly more favorably to the following: 'In the last 3 months, how much did you think about the good things you did to take care of your health problems?' at follow-up (M=4.5) compared to baseline (M=3.8) (p ≤ .05). Participants also reported spending more time taking care of their own health, 'In the last 3 months, did you make time to take care of your health?', at follow-up (M=4.7) compared to baseline (M=4.0) (p ≤ .05) (Table 3). Regarding salt intake, participants reported that they were less likely to add salt to food while cooking and while eating at follow up (M = 3.7; M = 3.5, respectively) compared to baseline (M = 3.1; M = 3.1, respectively) (p ≤ .05). There was no change over time in "reading food labels to know about sodium/salt content" (Table 4).

Focus Group Results

Benefits and modifications were suggested during the focus group discussions. Benefits of participating in the program mentioned by all participants included learning how to control blood pressure, about healthy eating and physical activity, and how to take medications. Participants mentioned that the health educator suffered personally from hypertension, which gave them confidence, and that she treated them with respect, had an understanding attitude, and was friendly, all of which served as motivations to attend the sessions. Additionally, the workshops were helpful in understanding the definition of,

Table 4: Change in Health Behaviors (Pre- and Post- Intervention).

Adherence	Baseline (n=39) M (SD)	Program End (n=39) M (SD)	Significance
What percent of your high blood pressure medication did you take in the last month?	M=84.3 (SD=30.2, n=23)	M=97.8 (SD=6.7, n=23)	T=-2.358 (df=22, p=.028
How often do you have difficulty remembering to take all your high blood pressure medication? [1]	M=1.4 (SD=.8, n=34)	M=1.3 (SD=.8, n=34)	T=.154 (df=33, p=.879)
Doctor-Patient Communication	**Baseline (n=39) M (SD)**	**Program End (n=39) M (SD)**	**Significance**
In the last 3 months, how often did your doctor or nurse listen to what you said about your health problems? [2]	M = 3.0 (SD=1.6, n=36)	M=3.6 (SD=1.3, n=36)	T= -1.574 (df=35, p=.124)
In the last 3 months, how often did your doctor or nurse tell you the results of any tests in a way you could understand? [2]	M = 3.4 (SD = 1.5, n = 37)	M=3.9 (SD=1.4, n=37)	T= -1.310 (df=36, p=.198)
Proactive Health Behaviors	**Baseline (n=39) M (SD)**	**Program End (n=39) M (SD)**	**Significance**
In the last 3 months, did your family or friends exercise with you? [2]	M = 3.0 (SD = 1.5, n = 38)	M=3.5 (SD=1.6, n=38)	T= -1.648 (df=37, p=.108)
In the last 3 months, did you share healthy low-fat recipes or foods with family or friends? [2]	M = 3.0 (SD = 1.5, n = 37)	M=3.7 (SD=1.5, n=37)	T= -2.145 (df=36, p=.039)
In the last 3 months, how much did you think about the good things you did to take care of your health problems? [2]	M = 3.8 (SD = 1.5, n = 37)	M = 4.5 (SD= .9, n=37)	T = -3.080 (df = 36, p = .004)
In the last 3 months, did you make time to take care of your health? [2]	M = 4.0 (SD = 1.4, n = 37)	M = 4.7 (SD=.8, n=37)	T = - 2.707 (df = 36, p = .010)
Diet- Salt Intake	**Baseline (n=39) M (SD)**	**Program End (n=39) M (SD)**	**Significance**
Add salt to food while cooking[3]	M = 2.3 (SD = 1.2, n= 38)	M = 2.7 (SD=1.1, n=38)	T = -2.343 (df = 37, p = .025)
Add salt to food while eating[3]	M = 3.1 (SD=1.0, n= 39)	M = 3.7 (SD=.5, n=39)	T = -4.238 (df = 38, p = .000)
Eat foods high in sodium[3]	M=3.1 (SD=.8, n=38)	M=3.5 (SD=.8, n=38)	T = -2.122 (df = .041, p = .041)
Read food labels to know about sodium/salt content[3]	M=2.2 (SD=1.2, n=39)	M=2.0 (SD=1.1, n=39)	T = 1.000 (df = 38, p = .324)

importance of, and how to check blood pressure daily, how to exercise properly, how to read nutrition labels, the consequences of not taking care of oneself, and how daily-food intake linked with behavior change. Participants also shared that they disseminated the information to family and friends and were inspired to receive a diploma as a result of the program. Participants reported several positive behavior changes as a result of the program, categorized into three themes: increasing physical activity (dancing more), changes to diet (consuming less salt), and increasing medication adherence. Lastly, the duration and length of the workshop were deemed appropriate, as was the accompanying hypertension book.

Program modifications proposed by participants included expanding to other clinic sites for increased patient access, incorporating exercise classes as part of the educational program, (e.g., dance), offering healthy snacks during the educational sessions, incorporating a social support group to share information, allowing more time to give written evaluation feedback during each session, and providing more information on different types of hypertension medication and different types of insurance coverage for paying for medication.

Discussion

Results demonstrate that those who took part in this 16-week educational and case management intervention showed significant improvements in health status, adherence, and health behaviors. Participants showed improvements in TC, HDL-C, LDL-C, triglycerides, and in their reported adherence to their treatment plan of hypertension drugs from pre- to post intervention assessment. Participants were also more likely to share low-fat recipes with their loved ones, less likely to add salt to their diet, and more likely to spend more time on taking care of their health at post-intervention. In general, participants reported that the workshops were helpful for learning how to manage blood pressure and how behavior is related to hypertension. Participants reported several positive changes as a result of the program, categorized into three themes: positive shifts in PA, diet, and medication adherence. Our findings are similar to those of a longer, 9-week randomized community intervention to improve hypertension control among Mexican American adults in El Paso, Texas. The Promotoras de Salud Contra la Hipertension (Community Health Workers against Hypertension) reports similar results which include positive behavior changes and improvements in some clinical outcomes, but no significant changes in blood pressure [34].

There are several limitations, inherent in a pilot feasibility project, which limit the ability to generalize results. Health education attendance varied and the case management sessions were not standardized. The sampling strategy was not randomized and a single cohort design methodology was utilized, which limits the ability to determine the program's actual effectiveness in comparison to a control condition.

Conclusion

This brief educational and case-management pilot intervention was acceptable to the target population and produced promising results. The community-based nature of this research project and the use of a community health center setting ensured participants received culturally and linguistically appropriate health care. Further

research is needed to determine the effectiveness of producing long-term change in hypertension medication adherence for underserved Hispanic communities in FQHC primary care settings. There is a need to identify effective strategies to improve hypertension awareness and knowledge among Hispanic adults [38], which can influence the practice of preventive health behaviors. Conducting longer trials to change health behaviors and provide participants with culturally tailored opportunities for skill building may result in improved blood pressure control. Similarly, as shown in a study using the DASH diet [27], working with participants to outline and implement small attainable goals may also be an effective strategy to promote healthier lifestyles and achieve a reduction of elevated blood pressure among this at risk population.

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Page 7/8

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Page 8/8