A Community Health Worker Intervention to Improve Management of Hypertension among Filipino Americans in New York and New Jersey: A Pilot Study

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Objective: The purpose of the pilot study was to assess the feasibility and efficacy of a 4-month community health worker (CHW) intervention to improve hypertension management among Filipino immigrants in New York and New Jersey.

Design: Single-arm CHW pilot intervention using a pre-post design delivered by 5 CHWs.

Setting: New York City, NY and Jersey City, NJ.

Participants: Of 88 Filipino individuals recruited for the study, 39 received the full pilot intervention, 18 received a partial intervention, and 31 dropped out; 13 Filipino participants, 10 CHW Trainers, and 3 Filipino CHWs were interviewed for qualitative analysis.

Intervention: Individuals participated in 4 workshops related to hypertension management and cardiovascular disease (CVD) risk factors and received monthly in-person visits, and twice monthly phone calls individually from a CHW.

Main Outcome Measures: Primary outcomes included blood pressure (BP) reduction and control, appointment keeping, and medication adherence; secondary outcomes included weight, body mass index (BMI), self-efficacy related to diet, exercise, and medication taking, CVD knowledge, and nutrition (salt/sodium and cholesterol/fat).

Results: A mixed method analysis was used to assess the intervention, utilizing quantitative and qualitative methods. By the end of the intervention, significant changes were exhibited for systolic and diastolic BP, weight, and BMI ($P<.01$). Significant changes were not seen for medication adherence and appointment keeping, however, CVD knowledge and self-efficacy related to diet and weight management all improved significantly ($P<.01$). Qualitative findings provided additional information on the acceptability, feasibility, and efficacy of the intervention.

Conclusions: This pilot CHW intervention showed evidence of feasibility, as well as efficacy, in improving hypertension management and reducing CVD factors in Filipino Americans. (*Ethn Dis.* 2014;24[1]:67–76)

Key Words: Hypertension, Blood Pressure, Filipino, Asian Americans, Immigrants, Community Health Workers

Introduction

Filipino Americans (FAs) experience disproportionately high prevalence rates of cardiovascular disease (CVD) and its risk factors.[1–3] According to data from the 2004–2006 National Health Interview Surveys (NHIS), 27% of FA adults self-reported a diagnosis of hypertension (HTN), the highest rate among Asian subgroups, a higher rate than Hispanics (24.1%), and one that is quickly approaching that of American Indians or Alaska Natives (32%) and African Americans (36%).[1,4] Compared to other Asian subgroups, FAs have low rates of controlled HTN,[5,6] and CVD and stroke have been identified as leading causes of death.[7]

This high CVD burden warrants attention, given that FAs are a growing minority population. Filipino Americans are the third largest Asian ethnic group in the United States when looking at Asians alone and in combination with other groups; New Jersey and New York have the fourth and fifth largest Filipino populations in the United States, respectively, and both showed a 33% population growth between 2000–2010.[8,9] Despite rapid growth, limited data exists about the health status and needs of FAs.

Several factors may explain the high rates of HTN in the FA community. Compared to other Asian subgroups FAs are more likely to be overweight or obese, have high rates of physical inactivity (38.2%),[1,10–12] and traditional Filipino diets are high in sodium and cholesterol.[13] The NHIS also found that 8.7% of Filipinos were moderate/heavy drinkers and 13.9% of Filipinos were current smokers.[1] Compared to FA traditional settlement locations such as California, there are fewer established networks and resources to support FA immigrants in the New York City region, which poses significant implications for their health and well-being.[14] Poor disease management may be attributed to limited culturally and linguistically appropriate education materials, poor knowledge of the health care system, and a lack of health insurance.[15,16]

Behavioral health interventions can potentially address factors influencing FA's cardiovascular health.[17] The community health worker (CHW) model has been demonstrated as an effective approach to improve health-related outcomes among minority groups.[18] As trusted laypersons who share a set of common characteristics with the

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population at risk, including ethnicity, religion, language, and culture, CHWs bridge individuals to the health care system by providing cultural linkages, overcoming distrust, and strengthening patient-provider communication.[14,19,20] This workforce educates, coaches, and counsels individuals to adopt healthy behaviors while monitoring their health status, thereby enhancing adherence to care.[21] While CHW approaches have been documented and employed within ethnic minority US populations such as Latinos and African Americans, few studies have focused on Asian Americans. In particular, despite evidence that HTN is a salient issue for FAs,[5,22–24] little guidance exists on mitigating the CVD risks of this group using community-based approaches.

This article reports on the pilot study of Project AsPIRE (Asian American Partnership in Research and Empowerment) funded by the National Institutes of Health (NIH) National Institute on Minority Health and Health Disparities. Utilizing a community-based participatory research (CBPR) approach, our study evaluates the acceptability, feasibility, and efficacy of a 4-month CHW intervention designed to improve HTN management and CVD risk factors among FAs.

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METHODS

Research Design

The principles of CBPR informed the development and implementation of our intervention; CBPR utilizes the knowledge and expertise of all partners in order to enhance the understanding of problems within a community and addresses these problems with action-oriented solutions.[25,26] An infrastructure was created ensuring equal participation and decision-making within a coalition of 21 community and academic partners throughout the study design and implementation.[27] Community partners and CHWs ensured cultural appropriateness of data collection instruments and identified strategies to overcome recruitment and retention barriers. In addition to assessing feasibility and efficacy of the CHW intervention, goals included addressing recruitment and retention challenges and developing strategies to improve the intervention for a larger randomized controlled trial (RCT). No control group was utilized and greater emphasis was placed on the application of a mixed-method approach for study evaluation.

Recruitment and Eligibility

Individuals were eligible for participation in the intervention if they: 1) self-identified as Filipino; 2) were aged 25–75; 3) lived in New York City or Jersey City, New Jersey; and 4) had one systolic blood pressure (SBP) reading of $\geq$132 mm Hg or one diastolic blood pressure (DBP) reading of $\geq$82 mm Hg. This lower blood pressure (BP) cut-off point was used to capture controlled hypertensive individuals using ambulatory BP guidelines,[28] and to explore if controlled hypertensive individuals could maintain low BP readings. Individuals were excluded if they were on renal dialysis, had participated in a previous CVD study, or had experienced a heart attack or stroke. Participant recruitment methods have previously been described.[17] Eighty-eight eligible individuals consented to participate in the study. Of the consented individuals, 31 (35%) dropped out, 18 (21%) completed some of the intervention, and 39 (44%) completed the full intervention (receiving at least 3 educational sessions). Of those completing the full intervention, 33 completed follow-up surveys and were included in analyses.

Study Intervention

The intervention occurred between March 2009 and October 2010. Four 90-minute workshop sessions were delivered monthly by the CHWs, utilizing a condensed version of the National Heart, Lung, and Blood Institute (NHLBI) Healthy Heart, Healthy Family (HHHF) curriculum, designed for CHWs to administer in the FA community.[29] Sessions were held in the local library, community centers, apartment buildings, and the lead community partner's office. To ensure cultural appropriateness and feasibility, community partners recommended changes to the curriculum (Table 1), and the number of sessions was condensed from 10 to 4. The intervention was delivered by 3 male and 2 female, trained, bilingual Filipino CHWs, aged 25–63; 3 were full-time and 2 were part-time. All CHWs had leadership positions in community-based associations and extensive community organizing experience.

Between sessions, CHWs conducted twice-monthly phone calls and monthly in-person visits at locations convenient for participants. Follow-up by CHWs involved linking and negotiating access to a primary care physician, providing social support, and ensuring adherence to medication taking and appointment keeping through reminders or accompaniment to the participants' physician appointments. The CHWs made any necessary referrals to other services (ie, mental health and tobacco cessation). Attendance at group sessions and individual visits were recorded to determine intervention dosage. The CHWs completed checklists that estimated the

Table 1. Curriculum overview and cultural components

Session topic	Session Overview	Tailored Cultural Components
Heart disease and heart attack	1. How the heart works & the heart's structure 2. Facts and risk factors of heart disease 3. What is a heart attack & the importance of rapid treatment for a heart attack 4. Warning signs of a heart attack 5. The role of emergency medical services & how to plan ahead	1. Information was added to highlight local health and social services and health insurance options for low-income immigrants
Control of cholesterol and control of blood sugar	1. Facts about saturated fat, trans fat, and cholesterol 2. Nutrition facts label activity 3. Cooking with less saturated fat 4. Your weight and your health & the healthy way to lose weight 5. Serving size activity 6. Diabetes - What is it, types, & symptoms 7. Complications of diabetes & diabetes control 8. Hidden sugar in drinks activity	1. The discussion of CVD risk factors was contextualized into Filipino history and culture
Physical Activity, weight management, and BP control	1. Getting started with physical activity 2. Tips to physical activity and staying motivated 3. Stretching activities 4. Sample walking program 5. Facts about BP and stroke 6. Salt and sodium 7. Alcohol 8. Managing high BP with medicine	1. Food and exercise examples were realistic options in the NYC/NJ communities 2. Included discussions on disease management (ie, medication adherence)
Nutrition and cigarette smoking	1. The traditional Filipino diet 2. A heart healthy eating plan for Filipino families 3. How to choose heart healthy foods 4. Cooking with children 5. Eating heart healthy with little time 6. Saving money on your food bill 7. Facts about smoking & secondhand smoke 8. Youth and smoking 9. Smoking and your wallet	1. Food examples remained in Filipino terms (eg, chicharon was more understandable than ''pork rinds'')

amount of time spent on key curriculum components, and deviations from the recommended content and timelines were indicated.

Outcome Measures

Data were collected at screening, baseline and 4-months. Clinical measurements were obtained by a trained CHW. Primary outcomes included change in BP, control of BP, medication adherence, and appointment keeping. Three BP measurements were taken at 5-minute intervals, using Omron HEM-712C automatic BP monitors. The mean of the second and third SBP and DBP measurements were used to measure change across the group between time points.

Secondary outcomes included change in weight and BMI, CVD knowledge, weight management, salt and sodium intake, cholesterol and fat intake, and self-efficacy related to diet, exercise, and medication taking. Height was measured at screening, and weight was captured at screening and the 4-month follow-up; both were used to calculate BMI. The validated Hill-Bone Compliance Scale for compliance to high BP therapy measured medication taking (9 items) and appointment keeping (3 items).[30] Medication self-efficacy was measured using an adapted cardiac medication survey instrument from the NYU Cardiac Rehabilitation Center (11 items).[31] Salt and sodium were measured using combined questions from the validated Hill-Bone Compliance to High BP scale and the validated HHHF salt and sodium scale (11 items).[29,30] Cholesterol and fat were measured using the validated HHHF cholesterol and fat scale (8 items). Weight management was measured using the validated HHHF weight management scale (8 items). Cardiovascular disease knowledge was measured using the validated HHHF CVD knowledge and behavior scale (13 items).[29] Diet self-efficacy (2 items) and cardiac exercise self-efficacy (3 items) were measured using adapted versions of the NYU Cardiac Rehabilitation Center survey instrument (11 items).[31] Social support was measured using the NHLBI CHW Activity Evaluation tool (3 items). Acculturation was measured only at baseline with questions from the validated A Short Acculturation Scale for Filipino-Americans (7 items).[32] This study was approved by the NYU Institutional Review Board.

Statistical Analysis

Quantitative Analysis

Frequencies of baseline sociodemographic variables were performed for the 33 individuals with complete data. Paired

Table 2. Baseline participant demographics

	n	%
Age, mean (SD)	53.2 (10.8)	
Sex		
Male	6	18.2
Female	27	81.8
Marital status		
Single	11	33.3
Married	18	54.5
Divorced/separated/widowed	4	12.2
Education		
≤High school	4	12.1
Some college	7	21.2
≥College	22	66.7
Employment		
Full-time	22	66.7
Part-time	5	15.1
Does not work	6	18.2
Income		
≤$25,000	7	21.2
$25,001 - $55,000	3	9.1
>$55,000	5	15.2
Declined to state/don't know	18	54.5
Years in United States, mean (SD)	10.9 (9.1)	
English spoken fluency		
Not well/Not at all	4	12.1
Well	15	45.5
Very well	14	42.4
Health insurance		
None	24	72.7
Public	2	6.1
Private	6	18.2
Other	1	3.0
Self-rated health status		
Excellent/very good	10	30.3
Good	13	39.4
Fair/poor	10	30.3
Acculturation scale, mean (SD), 1=low, 5=high	2.02 (.41)	
Social support scale, mean (SD), 1=low, 5=high	3.42 (.56)	

sample *t*-tests detected differences across time for clinical and scale measurements, and Fisher's Exact tests detected differences across time for categorical variables. Significance was set at $\alpha = .05$. Program evaluation surveys were analyzed for feedback from participants about the program. Analyses were performed using SPSS 19.0 (Chicago, IL).

Qualitative Analyses

To further explain factors that may have affected intervention efficacy, interviews were conducted with pilot study CHWs, CHW trainers, and pilot study participants; a secondary qualitative data analysis was conducted using CHWs' participant care logs and an interview with one CHW. Interviews elicited descriptions of the types of activities CHWs engaged in with participants, the dynamics of the relationships, and how they were or were not helpful for the participants, what they did with the participants, and how these factors influenced changes in behaviors. Transcripts from 26 qualitative interviews (3 CHWs, 10 trainers, and 13 participants) were reviewed for themes related to feasibility, acceptability, and efficacy. Analysis was conducted by a co-investigator using Atlas.ti 6.0 (Berlin, Scientific Software Development). Narrative analysis techniques were utilized whereby themes that related to the particular themes were identified, and core codes and secondary codes were assigned.[33] Relationships between codes within themes were also explored. Inter-rater agreement for the coding schema was reached by having an additional trained qualitative researcher randomly code 20% of the transcripts; agreement exceeded 80%.

RESULTS

Quantitative Findings

Sample Characteristics

Mean ± SD age was 53.2 ± 10.8 years and 82% were female. Table 2 presents demographic characteristics for the overall sample. All individuals were foreign-born; mean ± SD years lived in the United States was 10.9 ± 9.1. Seventy-three percent of individuals were uninsured and 30% reported their health as fair or poor. Mean acculturation (out of 5) for the group was low (2.02 ± .41), while social support (out of 5) was higher (3.42 ± .56).

Primary Outcomes

Significant decreases were seen in SBP and DBP as well as BP control (Table 3). The average decrease in SBP was 13.7 mm Hg ($P<.001$), and the average decrease in DBP was 6.8 mm Hg ($P<.01$). The percentage of individuals with controlled BP increased from 54.5% at screening to 81.8% at 4-months ($P=.017$). Appointment keeping showed a non-significant change in the correct direction ($P=.102$), while medication adherence did not change. Five individuals self-reported a diabetes

Table 3. Changes in outcomes[a]

	n	Baseline	4 Months	Mean Change (95% CI) Baseline to 4 Months	*P*
Primary outcomes					
Systolic BP, mm Hg	33	139.1 (14.2)	125.4 (19.5)	−13.7 (−19.8, −7.5)	<.001
Diastolic BP, mm Hg	33	81.5 (10.7)	74.7 (7.8)	−6.8 (−10.6, −3.1)	.001
BP under control, *n* (%)	33	18 (54.5)	27 (81.8)	n/a	.017
Appointment keeping scale, 1=bad, 4=good	23	3.39 (.48)	3.55 (.41)	−.16 (−.03, .35)	.102
Hillbone medication scale, 9=perfect score	13	11.15 (2.73)	11.54 (2.15)	.39 (−1.33, 2.10)	.635
Secondary outcomes					
BMI, kg/m^2	30	27.6 (4.6)	26.5 (4.3)	−1.1 (−1.6, −.5)	<.001
Weight, pounds	30	148.9 (27.2)	143.2 (25.9)	−5.7 (−8.6, −2.8)	<.001
Not including job, any physical activity, *n* (%)	33				.147
Every day		10 (30.3)	17 (51.5)	n/a	
2 or more times a week		11 (33.3)	10 (30.3)	n/a	
CVD knowledge scale, 13=perfect score	33	8.24 (2.36)	11.42 (1.52)	3.18 (2.31, 4.05)	<.001
Weight management scale, 1=bad, 4=good	33	2.80 (.45)	3.16 (.50)	.37 (.21, .53)	<.001
Cardiac exercise self-efficacy scale, 1=low, 5=high	31	3.78 (1.01)	4.05 (.88)	.27 (−.07, .61)	.119
Diet self-efficacy scale, 1=low, 5=high	32	3.72 (1.21)	4.20 (.94)	.48 (.13, .83)	.008
Salt/sodium scale, 1=bad, 4=good	29	3.16 (.36)	3.35 (.35)	.20 (.04, .35)	.015
Cholesterol/fat scale, 1=bad, 4=good	32	2.60 (.65)	2.91 (.61)	.31 (.06, .55)	.015
Cardiac medication self-efficacy scale, 1=low, 5=high	15	4.69 (.43)	4.70 (.32)	.02 (−.20, .23)	.859
Health insurance, yes, *n* (%)	33	9 (27.3)	11 (33.3)	n/a	.789
Smoking and alcohol					
Current cigarette smoking, *n* (%)	33	5 (15.1)	4 (12.1)	n/a	1.000
Drink alcohol, yes, *n* (%)	33	19 (57.6)	15 (45.5)	n/a	.460
Not including job, any physical activity, *n* (%)	33				.147
Every day		10 (30.3)	17 (51.5)	n/a	
≥2 times a week		11 (33.3)	10 (30.3)	n/a	

[a] Data are mean (SD) unless indicated otherwise.

diagnosis at the time of the screening; a separate analysis was performed for these individuals. SBP decreased 10.3 mm Hg and DBP decreased 14.1 mm Hg between screening and 4-months. All individuals with diabetes had uncontrolled BP at screening, and 2 (40%) had controlled BP at 4-months. Medication adherence improved slightly for individuals with diabetes (mean score of 10.25 at baseline to 10.00 at 4-months), and there was no change in appointment keeping.

Secondary Outcomes

Significant decreases were seen for weight and BMI ($P<.001$). The average decrease in weight was 5.7 pounds and the average decrease in BMI was 1.1 kg/m^2; additionally, 33% of individuals decreased their weight by greater than 5 pounds and 40% decreased their weight between 1 and 5 pounds. Significant improvements were seen for CVD knowledge, weight management, diet self-efficacy, and dietary behaviors related to salt and sodium and cholesterol and fat (Table 3). A positive, nonsignificant directional change was also seen for exercise self-efficacy, and cardiac medication self-efficacy did not show any change. The number of individuals who reported current cigarette smoking and current alcohol drinking did not change significantly, but slight decreases were seen. At 4-months, approximately 52% of individuals reported engaging in physical activity every day, compared to 30% at baseline. Additionally, the percentage of insured individuals increased slightly from baseline to 4-months, 27% to 33%.

CVD knowledge questions were examined separately to assess the major knowledge changes. Specific knowledge areas were high at baseline (following a heart healthy diet, physical activity, secondhand smoke, sodium, and saturated fat). Knowledge areas that improved significantly between time points include waist measure, BMI, cholesterol and the liver, lard and saturated fat, high cholesterol regardless of weight, and the definition of high BP. Additionally, all individuals correctly reported the answers for sodium, saturated fat, the definition of high BP, and heart healthy diet at 4-months (Table 4).

Participant Satisfaction

Ninety-seven percent of participants responded that the intervention had been very or extremely beneficial to them, and 91% responded that they would recommend the intervention to another FA with high BP. Nearly all

Table 4. Cardiovascular disease knowledge[a]

Question / correct answer	*N*	Baseline	4 Months	*P*
Can your waist measure indicate that you have a high risk of heart disease? Yes	33	16 (48.5)	28 (84.8)	<.001
Can BMI tell you if you are overweight? Yes	33	15 (45.5)	29 (87.9)	.004
Is the majority of cholesterol in the body produced in the liver? Yes	33	5 (15.2)	25 (75.8)	<.001
Can eating foods that are high in sodium increase your risk for high blood pressure? Yes	33	28 (84.8)	33 (100.0)	.053
Does lard have a low amount of saturated fat? No	33	8 (24.2)	23 (69.7)	<.001
Can saturated fat clog your arteries and increase your chance of a heart attack? Yes	33	29 (87.9)	33 (100.0)	.114
Is blood pressure of 140/90 considered high? Yes	33	27 (81.8)	33 (100.0)	.024
Do people know that their cholesterol is high because they have gained weight? No	33	9 (27.3)	20 (60.6)	.013
Is being physically active a way to reduce your risk for heart disease? Yes	33	29 (87.9)	32 (97.0)	.355
Only people with high blood cholesterol should follow a heart healthy diet. False	33	31 (93.9)	33 (100.0)	.492
Does secondhand smoke affect your heart? Yes	33	30 (90.9)	32 (97.0)	.613
Is having a fasting blood sugar of 126 mg/dL or higher considered diabetes? Yes	33	22 (66.7)	27 (81.8)	.260
Is having a waist measure of 35 inches (88.9 cm) or more healthy for a woman? No	33	23 (69.7)	29 (87.9)	.131

[a] Data are *n* (%) of correct answers unless indicated otherwise.

agreed that the intervention was somewhat or very helpful in providing information to improve heart health, in helping to change behaviors related to heart health, and in providing guidance on how to manage BP. All answered that the CHW was somewhat or very accessible and that the CHW somewhat or completely understood their needs and concerns. Overall, participant satisfaction was high (Table 5).

Table 5. Participant satisfaction

	n (%)
Overall, how beneficial has this intervention been to you?	
Somewhat	1 (3.1)
Very	10 (31.3)
Extremely	21 (65.6)
Would you recommend this intervention to another Filipino-American with high blood pressure?	
Definitely yes	29 (90.6)
How helpful was this intervention in… somewhat/very helpful	
Providing you information on how to improve your heart health	32 (97.0)
Helping you change your behavior related to improving heart health, such as increased exercise or changing diets	32 (97.0)
Proving you with guidance on how to manage your blood pressure	32 (97.0)
How accessible was the CHW?	
Very accessible	29 (87.9)
Somewhat accessible	4 (12.1)
How well did you feel the CHW understood your concerns and needs?	
Completely understood	24 (72.7)
Somewhat understood	9 (27.3)
If you had any concerns or questions, how often did you voice them to the CHW?	
Always	20 (60.6)
Sometimes	13 (39.4)

CHW, community health worker.

Qualitative Findings

Acceptability

In general, participants felt that they could relate to their CHW by virtue of their shared culture, language, and life experiences. They also felt that their CHW understood them; as one participant stated, "Yeah it's easier because you know you have the same culture and you know … at least you understand what he's talking about." One trainer mentioned that CHWs' shared culture allowed them to connect with participants, "So that's where the soul of CHWs is that they can connect with people from a common cultural, linguistic and life experience position." While culture and language were salient markers of a quality relationship between participants and CHWs, participants were most affected by CHWs' demonstrations of genuine concern for their health and well-being. One female participant described, "But for delivering her [CHW] lessons, it's… nothing very special. What is special there is that she is very much concerned… It's like there is a relationship… a closer relationship. She's very friendly… So that is how you are reminded of what you need to do. Perhaps, if it wasn't very personalized, it would not make a difference."

Trust in the CHWs and language concordance between participants and CHWs made a significant impact in expressing personal concerns regarding health and enabled participants to be more receptive of their CHWs' health teachings. CHWs agreed that similar culture and language, often even speaking

Table 6. Challenges experienced during pilot and modifications made to the full intervention

Target area	Reasons for Changes	Modifications Made to Full Intervention
Recruitment and retention	Target participants often have competing priorities and activities; Participants have limited time off from work; The surveys are long and take much time to administer	Link recruitment to social activities to draw and retain participants (ie, karaoke and line dancing nights and physical activities such as yoga, badminton aerobics); Encourage pastors to integrate AsPIRE in sermon; Community leaders at recruitment sites assist with informing participants of workshops; Minimize lag time between screenings and intervention delivery; Allow family members to participate in the sessions; Provide more incentives (eg, metro cards, pill boxes, prescription discount cards; grocery canvas bags, raffle prizes); Streamline survey tools; Participants encourage those in their network to participate.
	Filipino ''machismo'' mentality	Organize and sponsor sports events/activities, (eg, chess tournament, basketball tournament, badminton league and clinic); Partner with and co-sponsored health screenings with male associations, (eg, Knights of Columbus, Masons, and other Regional Associations); Assign male CHWs to male participants.
Follow up phone calls	Participants time off is often limited to nights and weekends; domestic workers are uncomfortable/limited when talking on the phone in employers' homes (eg, cameras); it is time consuming to call participant lists to remind individuals of upcoming sessions	CHWs make themselves available for calls late night/weekends; CHWs ensure main points of follow up touched upon at each call (eg, status of medication taking, doctors' visits).
One on one visits	Participants have limited free time due to long working hours; Participants are uncomfortable with CHWs coming into their homes (eg, limited privacy if living with an employer or many roommates)	CHWs maximize interaction on telephone calls; CHWs work with employers (eg, restaurant owners) for CHWs to have a follow-up station at worksites; CHWs invite participants for one on one visits in location that are convenient for them (eg, café, CHW's office).
Scheduling group sessions	It is challenging to organize individuals from various screenings into groups	If a participant is unable to join a scheduled group session within 2 weeks of baseline, or if a participant misses a group session, CHWs deliver educational session as a one on one session.

the same dialect, made the participants feel more comfortable asking questions and in turn, made them successful CHWs. Their approaches also took Filipino cultural traditions and social mores that value formal communication and a deference and respect for elders into consideration. These factors seem to have facilitated the receptiveness and acceptance of CHWs.

Furthermore, participants' understanding of the material was enhanced by how it was delivered. One participant described her interaction with her CHW ''[she] really discussed things. She explained clearly, you know…in our level really, like, no knowledge at all, medical or whatever. So we were able really to understand.''

Feasibility

Establishing feasibility involved community and academic partners working together to regularly address challenges as they arose during the pilot, including recruitment, retention, and intervention delivery. For instance, to improve retention, CHWs demonstrated persistence and flexibility and a genuine interest in helping participants control their BP, and also provided incentives such as subway fare cards to minimize travel challenges. Female CHWs also faced challenges with recruitment of and reception by male participants. One CHW noted, ''Males are harder to get because of their machismo'' and were more likely to listen to other males. Assigning male CHWs to male participants was a key facilitator for recruitment. Additional modifications are shown in Table 6.

Efficacy

Many participants reported a gained sense of ownership and empowerment over their health through participation in the intervention. Participants reported learning something new from their CHW that ultimately influenced their decisions to change some aspect of their health behaviors. In most cases, the experience was described as having their eyes opened to the realities of their health. Participants' crisis-oriented fatalist views towards health, or the idea of 'bahala na' (translation: whatever will be will be), were recast in such a way that prevention strategies (eg, lifestyle changes regarding diet and exercise) were given greater value.[34,35] One female participant shared, ''If you now become aware of your health, even though these people [CHWs] will not tell you what to do, this becomes part of your activity, like the exercise, the food. You become conscious of all of these things. I think the initial [program]…. give[s] us like an insight or an overview and then it's

up to you. It's up to you to do it to yourself. It's like [the CHW]…the way I look at it, opened [our] eyes. I'm very conscious about my blood sugar, which was mentioned during that class session." Similarly, a CHW trainer noted that "…it's more accepted when the CHW is able to reframe and kind of shift people's thinking into, 'well maybe those traditional ways are not as healthy as we used to think they were.'"

Participants shared what had been learned from the intervention with family and friends. One participant described her greater sense of awareness regarding her health, and illustrated that sharing health information was another form of providing for her family: "I became very conscious and I also share with them [family] the knowledge that I've learned from the program. Now, they're also very conscious which I know, is so important, 'cause they would not get all this information from anywhere else - from their doctor."

The CHWs also addressed health care issues that participants faced, such as hesitations to see a physician due to fear of learning they were sick and paying high medication costs. Many were not comfortable seeing non-Filipino doctors because of language barriers. The CHWs accompanied participants to the doctor and coached them on how to adhere to their prescribed medications. Graduation ceremonies organized for participants by the CHWs provided opportunities to celebrate participants' progress and share the benefits of the intervention.

In this culturally tailored CHW intervention for hypertensive FAs living in New York City and New Jersey, we found that a CHW intervention is feasible and has the potential to be effective among this population.

DISCUSSION

In this culturally tailored CHW intervention for hypertensive FAs living in New York City and New Jersey, we found that a CHW intervention is feasible and has the potential to be effective among this population. A CBPR framework enabled the community and academic partners to continuously work together in assessing challenges during the pilot and to identify strategies to enhance acceptability, feasibility, and efficacy. Significant improvements were shown among the participants, both in clinical measures as well as in knowledge and self-efficacy related to HTN. A scant amount of past research has examined CHW interventions to improve HTN management in African American and Hispanic populations,[36–39] and only a few have shown significant changes across intervention time points.[37,38] Our study is the first to suggest that community-based CHW interventions have the ability to successfully improve HTN management in FA populations. Even with many controlled individuals in our sample, there was a large decrease in SBP and DBP, and an increase in BP control. Additionally, our qualitative evaluation brought to light which CHW qualities and attributes contributed to the success of this pilot intervention in the FA community. These include the CHWs' innate helping qualities, their shared demographic and cultural characteristics with the participants (ie, language, immigration status, and age), their established community trust and empowering nature, which are similar to what other CHW studies have found.[21,38]

Positive, significant changes were seen in SBP, DBP, weight, and BMI, as well as knowledge related to CVD, nutrition (cholesterol and fat, salt and sodium, and weight management), and self-efficacy related to diet and exercise. While change in health related factors such as appointment keeping and medication self-efficacy were not significant, this intervention focused more on behavioral change, and as a result, many participants used behaviors such as diet and exercise to control HTN rather than antihypertensive medications and visits to the doctor. Additionally, the majority of individuals did not have health insurance.

Several limitations about our findings should be mentioned. First, our sample was small and did not include a control group, limiting our ability to draw a direct association between the changes and the CHW intervention. However, our positive results suggest that this intervention is efficacious. Additionally, some of our data was self-reported, such as appointment keeping and medication adherence. While we attempted to collect cholesterol and blood glucose as part of the intervention, these clinical measures were difficult to obtain and the sample was very small. However, among the 10 individuals with blood glucose readings, a mean change of 4.4 mg/dL was seen. We do not report on behavior change, such as amount of weekly physical activity performed, due to limited measures asked on the surveys. Our current full intervention includes more detailed information on physical activity that will help us to later understand the role of physical activity and other behaviors on CVD and HTN outcomes within this population.

In Swider's integrative literature review, she discussed that further analysis needs to be done on CHW outcome effectiveness given the differences in role types, populations targeted, and outcomes measured that make it difficult to draw sweeping conclusions about the overall effectiveness of CHWs.[18] While our pilot study does not provide an overarching picture of CHW effective-

ness, it offers a starting point to construct a CHW model that is culturally and linguistically tailored to the FA population. We are currently completing an RCT of a CHW intervention among a larger sample of FAs that utilized the valuable results from this pilot intervention to modify and improve the current design. Having demonstrated positive effects, this model has the potential for wide scale use in promoting and developing similar interventions in other minority communities.

In conclusion, community-based interventions such as this one are needed to reduce the risk factors related to CVD among minority populations experiencing significant cardiovascular health disparities.

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