



A community health worker intervention to improve blood pressure among Filipino Americans with hypertension: A randomized controlled trial

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ARTICLE INFO

Keywords:

Community-based participatory research
Community health workers
Minority health
Immigrants
Randomized controlled trial
Hypertension
Asian Americans

ABSTRACT

Behavioral interventions utilizing community health workers (CHWs) have demonstrated effectiveness in improving hypertension disparities in ethnic minority populations in the United States, but few have focused on Asian Americans. We assessed the efficacy of a CHW intervention to improve hypertension management among Filipino Americans with uncontrolled blood pressure (BP) in New York City (NYC) from 2011 to 2013. A total of 240 Filipino American individuals (112 in the treatment group and 128 in the control group) with uncontrolled hypertension (SBP \geq 140 mmHg and/or DBP \geq 90 mmHg) were recruited from community-based settings in NYC. Using a community-based participatory research approach, treatment participants received 4 educational workshops and 4 one-on-one visits with CHWs over a 4-month period, while control group participants received 1 educational workshop. Main outcome measures included BP control, changes in SBP and DBP, and changes in appointment keeping at 8-months. At 8-months, BP was controlled among a significantly greater percentage of treatment group participants (83.3%) compared to the control group (42.7%). The adjusted odds of controlled BP for the treatment group was 3.2 times the odds of the control group ($P < 0.001$). Both groups showed decreases in SBP and DBP, with greater decreases among treatment participants. Significant between-group differences were also demonstrated in adjusted analyses ($P < 0.001$). Individuals in the treatment group showed significant changes in appointment keeping. In conclusion, a community-based intervention delivered by CHWs can help improve BP and related factors among Filipino Americans with hypertension in NYC.

1. Introduction

Million Hearts© aims to prevent heart disease and stroke in the United States (US) by mobilizing public and private sectors around a core set of objectives, with particular attention on blood pressure (BP) control in minority populations (Department of Health and Human Services, n.d.). Disparities in hypertension among non-Hispanic blacks has been well-documented (Mensah et al., 2005; Ong et al., 2007; Centers for Disease Control and Prevention, 2005; Barnes et al., 2008). Research within Asian American communities is limited, yet a growing body of evidence indicates that compared to non-Hispanic whites, Filipino Americans experience a higher burden of hypertension (23.9–67%) (Barnes et al., 2008; Jose et al., 2013; Zhao et al., 2015;

Bayog and Waters, 2017; Ma et al., 2017; Ye et al., 2009; Ursua et al., 2013; Ursua et al., 2014a) and lower rates of control (Zhao et al., 2015; Ursua et al., 2014a; Ea et al., 2018). Given the rapid population expansion of Filipino Americans in the US (38.9% increase between 2000 and 2010) (U.S. Census Bureau, 2012) as well as in regions such as New York City, (Federation AA, 2009) strategies to mitigate the burden of hypertension among Filipinos are warranted (Ursua et al., 2014b).

A cornerstone of Million Hearts© has been the dissemination of evidence-based, community-clinical linkage strategies, including the use of community health workers (CHWs). CHWs are frontline public health professionals with a close understanding of the communities they serve through shared racial/ethnic background, culture, language, socioeconomic status, and life experiences (American Public Health

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Association, 2014; Islam et al., 2015). They link community members to healthcare resources, provide culturally appropriate health coaching, and organize communities to improve physical and social well-being (USAID From the American People, n.d.). CHWs involved in chronic disease management provide social support and education on disease management (Adair et al., 2013; Katigbak et al., 2015; Lopez et al., 2017; Islam et al., 2018).

CHWs can improve hypertension control among low-income and minority populations (Katigbak et al., 2015; Islam et al., 2013a; Brownstein et al., 2005; Spencer et al., 2011; Islam et al., 2014; Islam et al., 2013b; Martinez et al., 2011; Brownstein et al., 2007). For example, CHW interventions have demonstrated significant improvements in BP control and self-management behaviors, including appointment keeping and antihypertensive medication adherence (Brownstein et al., 2007; Balcazar et al., 2009; Hess et al., 2007; Kim et al., 2016). To our knowledge, only our previous pilot work has examined the impact of a CHW intervention on hypertension control in the Filipino community; our findings showed a significant mean decrease in systolic blood pressure (SBP) (13.7 mmHg) and diastolic blood pressure (BP) (6.8 mmHg), weight (5.7 pounds), and body mass index (BMI) (1.1 kg/m²) (Ursua et al., 2014b). As Million Hearts© continues wide-scale dissemination efforts, models to improve BP control in populations like the Filipino community will be important in achieving goals set forth by the initiative.

Based on the encouraging findings from our pilot study, (Ursua et al., 2014b) we designed and conducted a study utilizing a community-based participatory research (CBPR) approach to test the effectiveness of a CHW intervention on hypertension-related outcomes among Filipino Americans with hypertension in New York City (NYC). We assess the efficacy of the intervention on BP control, SBP and DBP, and compliance to appointment keeping.

2. Methods

2.1. Study design

Project AsPIRE (Asian American Partnership in Research and Empowerment) is a CBPR study utilizing a randomized controlled trial design. Filipino American individuals with hypertension were assigned in a 1:1 ratio to a treatment or control group. The research protocol was approved by the NYU institutional review board, and all participants were provided with written informed consent before study enrollment. The study has been registered at ClinicalTrials.gov (Asian American Partnerships in Research and Empowerment (AsPIRE) NCT03100812).

2.2. Study setting and participants

Individuals self-identifying as Filipino (based on the screening question: “Are you of Filipino descent?”), aged 25–75, living in NYC, and hypertensive based either on the average value of the 2nd and 3rd BP measurements (≥ 140 mmHg for SBP or ≥ 90 mmHg for DBP if not diagnosed with diabetes, and ≥ 130 mmHg for SBP or ≥ 80 mmHg for DBP if diagnosed with diabetes) or on antihypertensive medication use (regardless of BP measurement) at screening were eligible for participation in the study. We excluded individuals who were on renal dialysis, had an acute or terminal illness or serious mental illness, had participated in a previous cardiovascular disease (CVD) study, or had a history of heart attack, stroke, or congestive heart failure. Eligibility age range was based on existing epidemiological data from previous studies examining hypertension among Filipino Americans (Stavig et al., 1988; Ryan et al., 2000; Grandinetti et al., 2005). We hoped to compare of our findings to the Filipino American population in other geographical areas. In addition, our coalition provided feedback on the increasing number of younger Filipino Americans diagnosed with hypertension. Recruitment occurred on a rolling basis from April 2011 through August 2012, and follow-up occurred 4-months and 8-months following

baseline surveys.

2.3. Screening and randomization

In line with CBPR principles, we worked closely with our community partners to identify traditional and non-traditional venues and events frequented by Filipino community members. In addition, Census data was used to strategically sample in zip codes with large Filipino enclaves; faith, community, and business sites serving the Filipino community in those areas were engaged to host recruitment events. By using diverse sampling strategies, we minimized our risk of selection bias. Participants would also refer individuals in their personal network to meet with their CHWs to be screened for the study. At each recruitment event, staff or volunteers provided an explanation of the study and reviewed a consent form, confidentiality agreement, and liability release. After receiving study consent, a screening tool was administered by a licensed health professional. Three BP readings were taken five minutes apart on alternating arms. Height and weight measurements were taken. An exit interview was completed whereby trained staff provided health education related to the participants' risk factors, an explanation of the BP readings (the average of their 2nd and 3rd readings if BP was uncontrolled or untreated based on published guidelines), (National Heart Lung and Blood Institute, 2004) and an explanation of the study. Consent and screening took approximately 20 min.

A computer-generated randomization scheme was performed by the Project Coordinator, whereby individuals were placed into a predefined randomization table created by an outside Research Scientist. Individuals were stratified into a spreadsheet by age group (≤ 50 and > 50) and sex to ensure equal distribution across the study arms; this stratification was based on the mean age of our previously sampled populations within this community, in order to obtain randomization groups of similar sizes.

2.4. Intervention

The CHW intervention was guided by the Health Belief Model (Champion and Skinner, 2008) and Social Support Theory (Lakey and Cohen, 2000). The intervention was delivered by four Filipino CHWs employed by the study's community partner, Kalusugan Coalition, Inc. All CHWs were Filipino immigrants, fluent in English, Tagalog, and Visayan languages. One CHW was male aged 39, and three were female (age range 50–65); all had at least a bachelor's degree. The majority of the CHWs lived in Queens, where the sample was recruited, and all had strong ties with the Filipino community. The CHWs participated in a 60-h core-competency training prior to the intervention start (Ruiz et al., 2012).

The study took place between March 2011 and April 2013. All participants met with the CHW for an orientation session; the CHW administered a baseline interview which included questions on demographics, risk factors, personal and family history of CVD, and baseline BP measurements. During the 4-month intervention, treatment group participants attended 4 monthly 90-min group or individual CHW-led health education sessions. The National Heart, Lung, and Blood Institute (NHLBI) *Healthy Heart, Healthy Family* curriculum, which has been culturally-adapted for the Filipino community, was utilized (National Heart Lung and Blood Institute, n.d.). The curriculum was modified to include 4 sessions: 1) heart disease and heart attack; 2) control of cholesterol and blood sugar; 3) physical activity, weight management, and BP control; and 4) nutrition and cigarette smoking. During each session, CHWs provided interactive health education to participants using adult learning techniques such as theatre of the oppressed, role playing activities, and other culturally appropriate games and activities. Sessions were predominantly conducted in English, as the majority of participants were fluent in English. However, phrases and idioms in specific languages were often used or incorporated by

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