



## Evaluating community health workers' attributes, roles, and pathways of action in immigrant communities



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### ABSTRACT

Community health workers (CHWs) are uniquely positioned to improve health outcomes in immigrant communities; however, research on appropriate metrics for evaluating CHW attributes and mechanisms of effectiveness are limited. The objective of this paper is to characterize CHW attributes and pathways of action using adapted measures, develop a scale using these measures, and explore how findings can inform future CHW research and practice.

The study analyzed pre- and post-intervention group data from one quasi-experimental and three randomized controlled-design parent trials assessing the impact of CHW-led group and individual health coaching on various health outcomes in four New York City immigrant communities. We conducted descriptive, bi-variate and principal components analysis to develop a 13-item scale assessing CHW attributes, roles, and pathways of action. The sample included 437 individuals completing the intervention arm of a CHW study. We found CHWs were reported to affect change through a number of mechanisms and participants expressed substantial communal concordance with the CHWs in terms of country of birth, language, and culture. Principal components analysis with promax rotation identified 13 items with three factors and high Cronbach's alphas: 1) valued interpersonal attributes of the CHW ( $\alpha = 0.784$ ); 2) CHW as a bridge to health and non-health resources ( $\alpha = 0.857$ ); and 3) providing accessibility beyond health providers ( $\alpha = 0.904$ ). Socio-demographic characteristics and differences in CHW pathways of action were identified by community. Study findings can guide improved selection and training of CHWs. Further, measures identified in the principal components analysis can be used to guide future CHW evaluation efforts.

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### 1. Introduction

Community Health Workers (CHWs), frontline health workers who act as bridges between the community and health systems, have been identified as important members of the health workforce in recent health reform efforts (U.S. Department of Health and Human Services, 2010). The importance of CHWs in improving health outcomes for underserved and minority communities has long been recognized by federal agencies and organizations (Matiz et al., 2014; Kangovi et al., 2015), and more recently by the Patient Protection and Affordable Care Act (Adair et al., 2013; Islam et al., 2015). A significant body of evidence demonstrates that adding CHWs to the primary care team can improve care for patients with chronic disease at a low cost (Matiz et al., 2014;

Kangovi et al., 2015; Adair et al., 2013; Islam et al., 2015; American Public Health Association, 2009; Martinez et al., 2011; Collinworth et al., 2014).

In order for CHWs to be effective in health promotion and prevention efforts, a shared culture with the communities in which they work is critical (Perez et al., 2006; Shahidi et al., 2015). However, "it is unclear which elements of culture and social context should be shared for CHWs to be effective (Arvey and Fernandez, 2012)." In fact, there are myriad personal characteristics that can potentially impact a CHW's ability to build trust and rapport with a community member (e.g. age, gender, religion, immigration status, personal health); however, few studies have characterized the nature of CHWs communal congruence with community members and the impact of this congruence on outcomes.

Numerous studies and reports have articulated CHW attributes, including a national CHW workforce study which was foundational in establishing a core list of recommended qualities of CHWs (U.S.

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Department of Health and Human Services, 2010; Viswanathan et al., 2009; Matos et al., 2011; Wiggins and Borbón, 1998). However, few studies have evaluated the relative importance (e.g. empathy, trust, communication style) of the interpersonal relationship between community members and CHWs. A number of studies have qualitatively explored key roles and activities that CHWs undertake to improve the health of community members (Wenzel et al., 2012; Katigbak et al., 2015; McCloskey and Flenniken, 2010). For example, one study found that sociocultural characteristics of CHWs mattered little, while trust was the most important characteristic of an effective CHW (Wenzel et al., 2012). To our knowledge, no studies have articulated potential metrics by which to assess these functions and pathways of action, despite calls to advance both the scientific and programmatic paradigm of CHW approaches (Arvey and Fernandez, 2012).

As a growing number of primary care settings consider the integration of CHWs into healthcare teams, it is necessary to understand which CHW attributes will most effectively foster community-clinical linkages, particularly as strategic hiring of CHWs has been noted as an important predictor of program success (Kangovi et al., 2015). Further, a better understanding of CHW roles and mechanisms for facilitating change among the clients they serve will further the research agenda and evidence base for CHW effectiveness in improving health outcomes. Using data from four CHW interventions in New York City, the purpose of this study was to 1) quantitatively characterize CHW attributes, roles, and pathways of action; and 2) explore how study findings can inform future programmatic and evaluation efforts in improving health outcomes.

## 2. Methods

### 2.1. Study design

Our analysis is generated from three randomized controlled trials and one quasi-experimental CHW parent interventions conducted in partnership with community based organizations serving immigrant populations in New York City. Each of the studies was designed and conducted utilizing a community-based participatory research approach. The studies include: 1) a diabetes management program among Bangladeshi Americans, 2010–2016 (Islam et al., 2014a); 2) a hypertension management program among Filipino Americans, 2010–2014 (Ursua et al., 2014); 3) a diabetes prevention program among Korean Americans, 2011–2014 (Islam et al., 2013a), and 4) a diabetes prevention program among Asian Indian Americans, 2012–2014 (Islam et al., 2014b). CHWs who were identified as community leaders with close connections to the target communities were recruited with input from studies' community advisory boards; across studies, CHWs participated in a standardized core competency training conducted in collaboration with a New York City based CHW trade association (Ruiz et al., 2012; Wiggins et al., 2013; Ingram et al., 2016). CHW recruitment and training and the participatory nature of the study, as well as how community members and CHWs were involved in all aspects of study design and implementation, are described in further detail elsewhere (Katigbak et al., 2015; N. Islam et al., 2014a; Ursua et al., 2014; Islam et al., 2013a; N.S. Islam et al., 2014b; Islam et al., 2013b).

An evaluation of the communal congruence of CHWs, CHW functions, and the pathways through which they operate was included in participant questionnaires, collected at baseline and the study endpoint (4- or 6-months) among study participants randomized into treatment and control groups at the individual or recruitment site level. For the current analysis, data from respondents in the treatment group of each parent study was examined, including baseline and follow-up data from the study end-point which included a series of CHW-related questions. All studies received Institutional Review Board approval and study participants provided written informed consent prior to participation. A total of 437 treatment group individuals completed both baseline surveys and CHW questions at study endpoint.

### 2.2. Materials and procedure

A total of 17 common questions were included at each study endpoint to assess individual respondents' perceptions and understanding of their CHWs' attributes, functions, and activities impacting health behavior or health outcomes; only questions that were asked across all 4 interventions were included. Questions were adapted from the Social Capital Community Benchmark Survey and the Hospital Consumer Assessment of Healthcare Providers and Systems survey (Hospital Consumer Assessment of Healthcare Providers and Systems, n.d.; Harvard Kennedy School, 2002). In addition, during the formative phase of each CHW study, an external evaluator conducted in-depth qualitative interviews with project CHWs to understand their roles and responsibilities; analysis of this data also informed the development of questions assessing CHW attributes, functions, and activities impacting health behavior or health outcomes (Islam et al., 2013b). Functions were defined as those actions with which CHWs were specifically responsible for as part of their position, including providing health education, facilitating connection to health services, and building connections among community members. Activities were defined as supportive actions that help fulfill functions, including making referrals, conducting home visits, and hosting health education classes. Surveys were administered in the respondent's primary language by trained, bi-lingual interviewer administrators other than the CHWs.

### 2.3. Statistical analysis

Questions regarding CHW attributes were scored so that high values reflected high trust, respect, and agreement; question responses ranged from 1 (low) to 4 (high). Questions assessing CHW socio-cultural congruence were answered using yes or no. We ran descriptive analyses on socio-demographic variables; CHW questions were run for the overall sample and by each immigrant subgroup included in the parent study. One-way ANOVAs and Chi-square tests examined significance by group for continuous and categorical variables.

We used principal components analysis to assess the construct validity of the 17 initial scale items selected for analysis, and to further reduce the dimensionality of the items (Jolliffe and Cadima, 2016). Unlike other types of factor analysis that assume that an underlying causal model exists, we used principal components analysis primarily for variable reduction. We reduced the 17-item scale using a principal components analysis with oblique (promax) rotation. Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Tests were checked, and communalities were retained if 0.4 or higher. Eigenvalues and Screen Plots were used to decide the number of factors to retain. Coefficients in the rotated pattern matrix of 0.6 or higher were retained for the final model. Reliability of each factor (internal consistency) was assessed using Cronbach's  $\alpha$ . SPSS Statistics version 21, IBM, Armonk, NY was used for all analyses.

## 3. Results

### 3.1. Study participant characteristics

Socio-demographic variables by ethnic subgroup and the overall sample are presented in Table 1. The sample included 130 Bangladeshi individuals, 113 Korean individuals, 108 Asian Indian individuals, and 86 Filipino individuals. All differences between subgroups were statistically significant at  $p < 0.001$  except for born outside the U.S., which was 100% for all groups. Average age was 54.1 years and average years lived in the U.S. 14.9; Asian Indians were least likely to speak English proficiently, while Filipinos were most likely to speak English very well. Nearly 43% of participants had no health insurance.

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