


Cultural Competence and Perceptions of Community Health Workers' Effectiveness for Reducing Health Care Disparities

Journal of Primary Care & Community Health
2015, Vol. 6(1) 10–15
© The Author(s) 2014
Reprints and permissions:
sagepub.com/journalsPermissions.nav
DOI: 10.1177/2150131914540917
jpc.sagepub.com


Linda M. Mobula¹, Mekam T. Okoye¹, L. Ebony Boulware²,
Kathryn A. Carson^{1,3}, Jill A. Marsteller^{1,3} and Lisa A. Cooper^{1,3}

Abstract

Introduction: Community health worker (CHW) interventions improve health outcomes of patients from underserved communities, but health professionals' perceptions of their effectiveness may impede integration of CHWs into health care delivery systems. Whether health professionals' attitudes and skills, such as those related to cultural competence, influence perceptions of CHWs, is unknown. **Methods:** A questionnaire was administered to providers and clinical staff from 6 primary care practices in Maryland from April to December 2011. We quantified the associations of self-reported cultural competence and preparedness with attitudes toward the effectiveness of CHWs using logistic regression adjusting for respondent age, race, gender, provider/staff status, and years at the practice. **Results:** We contacted 200 providers and staff, and 119 (60%) participated. Those reporting more cultural motivation had higher odds of perceiving CHWs as helpful for reducing health care disparities (odds ratio [OR] = 9.66, 95% confidence interval [CI] = 3.48-28.80). Those reporting more frequent culturally competent behaviors also had higher odds of believing CHWs would help reduce health disparities (OR = 3.58, 95% CI = 1.61-7.92). Attitudes toward power and assimilation were not associated with perceptions of CHWs. Cultural preparedness was associated with perceived utility of CHWs in reducing health care disparities (OR = 2.33, 95% CI = 1.21-4.51). **Conclusions:** Providers and staff with greater cultural competence and preparedness have more positive expectations of CHW interventions to reduce healthcare disparities. Cultural competency training may complement the use of CHWs and support their effective integration into primary care clinics that are seeking to reduce disparities.

Keywords

cultural competence, community health workers, hypertension outcomes, health disparities, health care delivery

Introduction

Community health workers (CHWs) “offer promise as a community-based resource to increase access to health care.”¹ CHWs can serve as patient advocates, bridging cultural and social gaps between patients and health care providers by working with multidisciplinary teams to reduce health disparities.²⁻⁴ Their role is multifunctional; they have been identified as community health advisors, lay health advocates, *promotoras*, outreach educators, community health representatives, peer health promoters, and peer health educators.⁵ Interventions integrating CHWs in the health service delivery team have been shown to improve adherence, blood pressure control and appointment keeping.⁶⁻¹⁰

Health care providers' and organizations' attainment of cultural competency have been proposed as complementary strategies to improve the quality of care delivered to patients from diverse groups in an effort to reduce health care

disparities.¹¹⁻¹⁴ Interpersonal cultural competency has been defined as the “ability of individuals to establish effective interpersonal working relationships that supersede cultural differences.”⁴ Organizational cultural competency allows a health care organization and its providers to understand the strengths and weaknesses and the unique needs of the population being served.¹⁵ Characteristics ascribed to organizational cultural competency include having health care practitioners, leaders, and staff who are ethnically or socially

¹Johns Hopkins University School of Medicine, Baltimore, MD, USA

²Duke University School of Medicine, Durham, NC, USA

³Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA

Corresponding Author:

Linda M. Mobula, Johns Hopkins Center to Eliminate Cardiovascular Health Disparities, Johns Hopkins University School of Medicine, 2024 East Monument Street, Baltimore, MD 21287, USA.
Email: mmobula1@jhmi.edu

similar to the community served; collecting and tracking data on quality of care, stratified by race; and engaging communities (eg, using advisory boards, hiring CHWs) in the design and delivery of health care facilities and services. Provider and organizational cultural competency may have synergistic effects on health care disparities and health outcomes.^{16,17}

The extent to which cultural competency of health care providers may influence the incorporation of CHWs into chronic disease care is unknown. We performed a cross-sectional study to examine the association of provider and staff self-reported cultural competency (cultural motivation, power and assimilation attitudes, and behaviors) and preparedness to deliver cross-cultural care with attitudes regarding the effectiveness of CHWs in reducing health care disparities.

Methods

Study Design

Project ReD CHiP (“Reducing Disparities and Controlling Hypertension in Primary Care”) and the ACT Study (“Achieving Blood Pressure Control Together”) are clinical trials of interventions to overcome barriers to hypertension control among patients receiving care at 6 community-based primary care practices in metropolitan Baltimore, Maryland, including 3 practices located in medically underserved areas of the city.¹⁸ The proportion of patients with uncontrolled blood pressure ($\geq 140/90$ mm Hg) at each of these sites ranged from 31% to 51% for African Americans and 24% to 44% for whites at the start of the trials. Prior to implementation of the study interventions (from April to December 2011), we invited 200 health care providers (physicians and nurse practitioners) and clinical staff (nurses, medical assistants, and others) from the participating practices to complete a questionnaire assessing attitudes toward several hypertension quality improvement strategies. In the survey, respondents also assessed their cultural competence in the following domains: motivation to learn about other cultures (cultural motivation), attitudes toward power and assimilation, frequency of culturally competent behavior and self-reported preparedness to deliver cross-cultural care. Because the ACT Study was designed to test a CHW intervention, the questionnaire also included items assessing perceptions of how a CHW intervention would affect health care quality and patient outcomes. Study protocols were approved by the Johns Hopkins Medicine Institutional Review Board.

Study Measures

Independent Variables

Provider and staff cultural competence and preparedness. We evaluated cultural motivation, power and assimilation

attitudes, culturally competent behaviors, and cultural preparedness using self-reported summary measures from previous studies.^{16,19-22} Several of these measures have been associated with greater patient satisfaction and involvement in care.^{12,19} Similar self-report measures of cultural competence have been linked to quality and equity of HIV care.¹³ Items for cultural preparedness were drawn from the Cultural Competence Assessment Instrument, which has been shown to reliably and validly²⁰ assess reported preparedness to deliver cross-cultural care.

We assessed provider and staff motivation to learn about other cultures by asking them to select their level of agreement with two items on a 5-point Likert-type scale (strongly disagree to strongly agree; Table 2). We assessed provider and staff attitudes regarding power and assimilation (awareness of racial inequities and privilege and acceptance of a cultural group’s choice to retain distinct customs and values by their level of agreement with items on a 5-point Likert-type scale (Table 2). Prior to analysis, negatively worded items were reverse coded so a higher score indicated a more favorable attitude. To measure culturally competent behaviors, we asked providers and staff to report the percent of time they performed the culturally competent behaviors (Table 2).

We assessed cultural preparedness using items measured on a 5-point Likert-type scale. All survey items are shown in Table 2. We examined mean scores on individual cultural competence and preparedness items as well as mean scores on the 4 summary measures.

Outcome Variables

Provider and staff perceived effectiveness of CHWs. To measure perceptions of the helpfulness of CHWs for reducing health disparities, we adapted a single question from an existing measure of health professionals’ motivation to improve quality of chronic illness care.²² Agreement with this question was measured on a 5-point Likert-type scale. We categorized provider and staff responses as “higher” perceived usefulness (including those responding “strongly agree” and “agree”) versus “lower” perceived usefulness (all other responses). The survey item is shown in the footnote to Table 3.

Statistical Analysis

Provider and staff characteristics were summarized using descriptive statistics and the groups were compared using Fisher’s exact tests and 2-sample *t* tests. A higher score on most items indicated more positive cultural competence and preparedness attitudes. However, we reverse-coded items on the power and assimilation scale so that a higher score reflected awareness of racial inequities and acceptance of the choices of ethnic minorities to retain customs and values distinct from those of the racial majority. We calculated scale scores by taking the mean of the nonmissing responses for each participant. We used 2-sample *t* tests to compare

provider and staff responses on the individual cultural competence and preparedness items and the scale scores. We performed multivariable logistic regression analysis adjusting for factors believed to be associated with the outcomes to evaluate the associations of aspects of cultural competency and preparedness with perception of CHWs. We also assessed potential moderation of independent variables (cultural competency and preparedness) by provider/staff status. The logistic regression analysis was repeated adding a term for the interaction of provider/status and the independent variable of interest. Analysis was performed using SAS version 9.3 (SAS Institute, Inc, Cary, NC). All tests were 2-sided and $P < .05$ was considered statistically significant.

Results

Study Population

We invited 200 providers and clinical staff and 119 (60%; 63% of nonresident providers, 32% of residents and 77% of clinical staff) participated in the survey. Overall, the majority of the participants were women (77%). Compared with providers, a higher proportion of staff were women (95% vs 57%). Provider participants included allopathic and osteopathic physicians and nurse practitioners. Clinical staff participants were registered nurses and medical assistants or licensed practical nurses. Additionally, the racial and ethnic distributions of provider and staff differed significantly, with a higher proportion of Asians among providers and a higher proportion of African Americans among staff (Table 1).

Provider and Staff Ratings of Cultural Competence and Cultural Preparedness

Provider and staff ratings of cultural competence and cultural preparedness are compared in Table 2. Provider and staff had similarly high ratings of willingness or motivation to learn about other cultures (4.4 vs 4.2). However, providers had significantly greater power and assimilation attitudes than clinical staff (3.5 vs 2.7). Culturally competent behaviors were reported with similar frequency among providers and staff (3.1 vs 3.1). Overall, staff rated themselves as more culturally prepared than providers did (3.8 vs 3.5). The largest difference between providers and staff in self-rated preparedness was about care for patients with low health literacy; staff felt more prepared than providers did (3.8 vs 3.1).

Provider and Staff Perceived Helpfulness of CHWs

Overall, 52 out of 110 respondents (47%), agreed or strongly agreed that CHWs would be helpful for reducing health

Table 1. Characteristics of the Providers and Staff.

| Characteristic | Providers (n = 57) | Staff (n = 62) | P |
|--|-----------------------|-------------------|-------|
| Age in years, mean (SD) ^a | 40.9 (12.0) | 36.7 (11.0) | .06 |
| Women, n (%) | 32/56 (57) | 58/61 (95) | <.001 |
| Hispanic, n (%) | 3/53 (6) | 2/61 (3) | .66 |
| Race, n (%): | | | <.001 |
| Asian | 15 (27) | 2 (3) | |
| African American | 7 (12) | 22 (35) | |
| White | 27 (47) | 28 (45) | |
| Other | 4 (7) | 7 (11) | |
| Unknown | 4 (7) | 3 (5) | |
| Training, n (%) | | | |
| Attending physician | 32 (56) | | |
| Medical resident | 19 (33) | | |
| Nurse practitioner | 6 (11) | | |
| Medical assistant/ licensed practical nurse | | 54 (87) | |
| Registered nurse | | 8 (13) | |
| Years at current practice, mean (SD) ^b | 5.3 (6.6) | 4.4 (4.0) | .40 |

^an = 54 for providers and n = 59 for staff.

^bn = 56 for providers and n = 59 for staff.

care disparities. The responses differed by provider status; 58% of providers and 37% of the staff agreed with the statement. Nine persons (8%) did not respond to the perceived helpfulness of CHWs to reduce racial health care disparities question.

Associations of Cultural Competency and Preparedness With Perceived Helpfulness of CHWs

Table 3 shows the associations of cultural competency and preparedness with provider and staff perceptions of CHW helpfulness.

Providers and clinical staff reporting higher cultural motivation had significantly higher odds (odds ratio [OR] = 9.66, 95% confidence interval [CI] = 3.48-28.80), as well as those reporting more frequent culturally competent behaviors had significantly higher odds (OR = 3.58, 95% CI = 1.61-7.92) and perceived CHWs as helpful for reducing health care disparities. Provider and staff power and assimilation attitudes were not significantly associated with their attitudes regarding CHWs' utility for reducing health care disparities. However, provider and staff reporting higher cultural preparedness had significantly higher odds (OR = 2.33, 95% CI = 1.21-4.51) of believing CHWs' would reduce health care disparities. For perceptions of CHWs' utility in reducing health care disparities, the interactions of provider status with cultural motivation and power and assimilation

Table 2. Mean (Standard Deviation) of Responses to Cultural Competency and Cultural Preparedness Questions by Provider/Staff Status.

| Question | Providers (n = 57) | Staff (n = 62) | P |
|--|--------------------|----------------|-------|
| Cultural motivation ^a | | | |
| “I have the responsibility to learn about all the different groups of people that make up society.” | 4.3 (0.7) | 4.1 (1.0) | .14 |
| “I should be aware of the different cultures that exist within my practice.” | 4.6 (0.6) | 4.4 (0.9) | .19 |
| Cultural motivation subscale | 4.4 (0.6) | 4.2 (0.8) | .12 |
| Power and assimilation ^a | | | |
| “Regardless of one’s race, anyone can succeed in the United States if they try hard enough.” ^b | 2.5 (1.1) | 1.8 (0.9) | <.001 |
| “Being white carries significant advantages in our society.” | 3.8 (0.9) | 2.6 (1.3) | <.001 |
| “Racial minorities should conform to the customs and values of the racial majority.” ^b | 4.2 (0.8) | 3.8 (1.1) | .02 |
| Power and assimilation subscale | 3.5 (0.6) | 2.7 (0.8) | <.001 |
| Cultural behaviors ^c | | | |
| “When I see a patient from a culture unfamiliar to me, I seek information about his/her culture.” | 2.7 (1.0) | 2.5 (1.2) | .42 |
| “I ask patient to tell me about their own explanation of illness.” | 2.9 (1.0) | 3.2 (1.2) | .25 |
| “I welcome feedback from coworkers about how to relate to patients from different cultures.” | 3.5 (0.8) | 3.4 (0.9) | .24 |
| “I adapt my care to patient’s preferences.” | 3.4 (0.6) | 3.2 (1.1) | .20 |
| “I remove barriers (eg, lack of insurance, need for interpreter) that affect the quality of health care for patients of different cultures.” | 3.2 (0.8) | 3.2 (1.1) | .80 |
| Cultural behaviors subscale | 3.1 (0.6) | 3.1 (0.8) | .81 |
| Cultural preparedness ^d : “How prepared do you feel to care for patients:” | | | |
| “with a different socioeconomic status than your own?” | 3.9 (0.8) | 4.0 (0.9) | .66 |
| “with a distrust of the US health care system in general?” | 3.2 (0.7) | 3.5 (1.0) | .05 |
| “with limited literacy?” | 3.1 (0.8) | 3.8 (0.9) | <.001 |
| “who are members of racial and ethnic minorities?” | 3.9 (0.7) | 4.0 (0.9) | .50 |
| Cultural preparedness subscale | 3.5 (0.6) | 3.8 (0.8) | .03 |

^aItems coded on a 5-point Likert-type scale: 1 = strongly disagree to 5 = strongly agree.

^bThe scale was reversed so that a higher score was a more positive attitude.

^cItems coded on a 4-point Likert-type scale: 1 = 0% to 25% of the time to 4 = 76% to 100% of the time.

^dItems coded on a 5-point Likert-type scale: 1 = very unprepared to 5 = very well-prepared.

were significant. In stratified models, greater cultural motivation was significantly associated with higher odds of perceiving CHWs as helpful for reducing racial disparities for

Table 3. Association of Cultural Competency and Cultural Preparedness With Perception of Community Health Worker (CHW) Role in Improving Patient Outcomes and Reducing Disparities.^a

| Cultural Competency/Preparedness | CHW Will Reduce Racial Disparities in Care ^b Adjusted OR (95% CI) |
|----------------------------------|---|
| Cultural competency | |
| Motivation attitudes | 9.66 (3.48-28.80) |
| Power and assimilation | 0.79 (0.44-1.44) |
| Behavior | 3.58 (1.61-7.92) |
| Cultural preparedness | 2.33 (1.21-4.51) |

Abbreviations: OR, odds ratio; 95% CI, 95% confidence interval.

^aRespondents were asked to state their level of agreement with the following statement: If there were a Community Health Worker (trained para-professional who provides, via phone and/or home visit, education and outreach to improve adherence to high blood pressure care and treatment) available to patients, this would: “help reduce racial disparities in care.” Models are adjusted for respondent’s age, sex, race (coded as black, white, other, unknown), years at practice, and provider/staff status.

^bItems coded on a 5-point Likert-type scale: 1 = strongly disagree to 5 = strongly agree.

both provider (OR = 3.17, 95% CI = 0.99-10.14) and staff (OR = 14.44, 95% CI = 2.78-75.2) subgroups. Greater power and assimilation attitudes were associated with lower odds of perceiving CHWs as helpful for reducing disparities among staff (OR = 0.40, 95% CI = 0.15-1.08),

Discussion

To our knowledge, this is the first study to examine the association between provider and staff self-reported cultural competence, cultural preparedness and perceptions regarding the usefulness of CHWs in reducing health disparities. Although 58% of providers perceived CHWs as helpful for reducing health care disparities, only 37% of staff felt the same. These findings merit further investigation since there must be buy-in from frontline staff as well as providers to successfully implement a CHW intervention.

Our findings could be explained, in part, by the possibility that providers and staff with greater cultural motivation, more frequent culturally competent behaviors and increased cultural preparedness, have increased cultural humility, recognize their own limitations in addressing barriers to care, and are willing to use outreach approaches, such as CHWs, that improve health care delivery for underserved populations.²³

Among staff, power and assimilation attitudes were actually negatively associated with perceived helpfulness for reducing disparities. Acknowledging racial inequities and the importance of minorities maintaining customs and values distinct from the dominant culture may not necessarily

translate into perceiving that CHWs would help to address health disparities.

Our study has limitations. Because this was a cross-sectional study, we are not able to determine whether increased cultural competence and preparedness improves perceptions of CHW effectiveness or vice versa. Additionally, self-reported measures are subject to recall and social desirability bias. Self-reported cultural competence does not necessarily correlate to true cultural competence. Since only 60% of eligible providers and staff responded to the questionnaires, our findings may not be representative of all providers and staff at the sites. Another potential limitation is the lack of generalizability to those practicing outside of large metropolitan areas or serving less diverse patient populations. Of note, our study sites varied considerably in the ethnic and socioeconomic profile of the patients they served. There might also be unmeasured confounding. Though we accounted for years in practice at the current site, we did not account for the overall number of years of clinical experience, previous cultural competence training, and experience working with diverse patient populations or in underresourced settings. Additionally, we could not account for provider and clinical staff's prior exposure to CHWs; however, to our knowledge, none of the sites were using CHWs at the time of the survey. Finally, the extent to which individual provider or staff attitudes and perceptions influence whether an organization ultimately employs a CHW is unknown.

Because CHWs are not health care providers, but agents from the community trained to interface with the health care community, CHWs are able to bridge cultural gaps between a diverse patient population and the health care system. Their incorporation into a health care delivery team can enhance both interpersonal and organizational cultural competency. Therefore, providers and clinical staff need to be more aware of the value added by CHWs to a delivery team. The Institute of Medicine calls for the "integration of cross-cultural education into health professions education to reduce health care disparities."⁴ A review identified the following changes to enhance sustainability of CHWs: integration into health care practice; organizational support for their role as part of the delivery team; and education of health care staff, administrators, and payers in order to improve understanding and acceptance of CHWs.²

Primary care clinics employing CHWs could consider provider and staff education about the important roles CHWs play in order to improve services to diverse populations.^{21,24} Moreover, fostering cultural motivation and incentivizing cultural behaviors could enhance provider and staff willingness to incorporate CHWs in primary care delivery models. Health care policy actions should also provide frameworks that allow for the successful integration of CHWs interventions as part of the delivery team. These measures should include the following: provision of

increased financing mechanisms for reimbursement of CHW services, allocation of resources for CHW training and clinic-community linkages, as suggested by the Affordable Care Act. Additionally, future research should identify the most effective ways to promote the use of CHWs within the social and organizational values and infrastructure of primary care clinics and communities.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work is supported by grants from the National Heart, Lung, and Blood Institute (P50HL0105187 and K24HL083113).

References

- Giles T, Aranda JM Jr, Suh DC, et al. Ethnic/racial variations in blood pressure awareness, treatment, and control. *J Clin Hypertens (Greenwich)*. 2007;9:345-354.
- Brownstein JN, Bone LR, Dennison CR, Hill MN, Miyong KT, Levine DM. Community health workers as interventionists in the prevention and control of heart disease and stroke. *Am J Prev Med*. 2005;29(suppl 1):125-133.
- Fisher TL, Burnet DL, Huang ES, Chin MH, Cagney KA. Cultural leverage: interventions using culture to narrow racial disparities in health care. *Med Care Res Rev*. 2007;64(5 suppl):243S-282S.
- Smedley BD, Stith AY, Nelson AR. Institute of Medicine, Committee on Understanding and Eliminating Racial and Ethnic Disparities in Health Care. *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*. Washington, DC: National Academy Press, 2003.
- Centers for Disease Control and Prevention. *Community Health Advisors: Models, Research, and Practice: Selected Annotations—United States*. Atlanta GA: US Department of Health and Human Services, 1994.
- Dye CJ, Williams JE, Evatt JH. Improving hypertension self-management with community health coaches [published online May 16, 2014]. *Health Promot Pract*. doi:10.1177/1524839914533797.
- Ursua RA, Aguilar DE, Wyatt LC, et al. A community health worker intervention to improve management of hypertension among Filipino Americans in New York and New Jersey: a pilot study. *Ethn Dis*. 2014;24:67-76.
- Margolius D, Bodenheimer T, Bennett H, et al. Health coaching to improve hypertension treatment in a low-income, minority population. *Ann Fam Med*. 2012;10:199-205.
- Morisky DE, Lees NB, Sharif BA, Liu KY, Ward HJ. Reducing disparities in hypertension control: a community-based hypertension control project (CHIP) for an ethnically diverse population. *Health Promot Pract*. 2002;3:264-275.

10. Cooper LA, Roter DL, Carson KA, et al. A randomized trial to improve patient-centered care and hypertension control in underserved primary care patients. *J Gen Intern Med.* 2011;26:1297-1304.
11. Beach MC, Price EG, Gary TL, et al. Cultural competence: a systematic review of health care provider educational interventions. *Med Care.* 2005;43:356-373.
12. Paez KA, Allen JK, Beach MC, Carson KA, Cooper LA. Physician cultural competence and patient ratings of the patient-physician relationship. *J Gen Intern Med.* 2009;24:495-498.
13. Saha S, Korhuis PT, Cohn JA, Sharp VL, Moore RD, Beach MC. Primary care provider cultural competence and racial disparities in HIV care and outcomes. *J Gen Intern Med.* 2013;28:622-629.
14. Anderson LM, Scrimshaw SC, Fullilove MT, Fielding JE, Normand J; Task Force on Community Preventive Services. Culturally competent healthcare systems. A systematic review. *Am J Prev Med.* 2003;24(3 suppl):68-79.
15. Office of Minority Health. National Standards for culturally and linguistically appropriate services (CLAS) in health care. *Fed Regis.* 2000;65(247):80865-80879.
16. Cross TL, Bazron BJ, Dennis KW, Isaacs MR. *Toward a Culturally Competent System of Care.* Washington, DC: Georgetown University Child Development Center; 1989.
17. Anderson LM, Scrimshaw SC, Fullilove MT, Fielding JE, Normand J; Task Force on Community Preventive Services. Culturally competent healthcare systems. A systematic review. *Am J Prev Med.* 2003;24(3 suppl):68-79.
18. Cooper LA, Boulware LE, Miller ER 3rd, et al. Creating a transdisciplinary research center to reduce cardiovascular health disparities in Baltimore, Maryland: lessons learned. *Am J Public Health.* 2013;103:e26-e38.
19. Campinha-Bacote J. The process of cultural competence in the delivery of health care services: a model of care. *J Transcult Nurs.* 2002;13:181-184.
20. Weissman JS, Betancourt J, Campbell EG, et al. Resident physicians' preparedness to provide cross-cultural care. *JAMA.* 2005;294:1058-1067.
21. Paez KA, Allen JK, Carson KA, Cooper LA. Provider and clinic cultural competence in a primary care setting. *Soc Sci Med.* 2008;66:1204-1216.
22. Lin MK, Marsteller JA, Shortell SM, et al. Motivation to change chronic illness care: results from a national evaluation of quality improvement collaboratives. *Health Care Manage Rev.* 2005;30:139-156.
23. Tervalon M, Murray-García J. Cultural humility versus cultural competence: a critical distinction in defining physician training outcomes in multicultural education. *J Health Care Poor Underserved.* 1998;9:117-125.
24. Brownstein JN, Chowdhury FM, Norris SL, et al. Effectiveness of community health workers in the care of people with hypertension. *Am J Prev Med.* 2007;32:435-447.

Author Biographies

Linda M. Mobula is a post-doctoral research fellow at the Johns Hopkins Center to Eliminate Cardiovascular Health Disparities and a Clinical Investigation Fellow in the Division of General Internal Medicine. Her research focus has been on community based participatory research domestically and globally, and improving cardiovascular health outcomes in underserved populations in the United States and in low- and middle-income countries. She has been involved in disaster preparedness and responding to humanitarian emergencies worldwide.

Mekam T. Okoye is a research fellow at the Johns Hopkins Center to Eliminate Cardiovascular Health Disparities. His research interest is in improving the quality of healthcare delivery and the health outcomes in underserved communities.

L. Ebony Boulware, MD, MPH, is Chief of the Division of General Internal Medicine in the Department of Medicine at Duke University. Her research focuses on improving access and quality of care for patients with chronic diseases, including hypertension and chronic kidney disease. She is particularly interested in identifying ways to eliminate disparities in health care and health.

Kathryn A. Carson is a Senior Research Associate in the Department of Epidemiology at Johns Hopkins Bloomberg School of Public Health and Core Faculty in the Welch Center for Prevention, Epidemiology and Clinical Research. Mrs. Carson has a master's of science degree in biostatistics and has been involved in clinical research for over 30 years.

Jill A. Marsteller, PhD, MPP, has been involved in health services research for 20 years. She is an Associate Professor of Health Policy and Management at the Johns Hopkins Bloomberg School of Public Health and is Jointly appointed in the School of Medicine. She specializes in evaluation of quality improvement programs and organizational behavior research, specifically in estimating the influence of organizational variables on quality improvement activities in hospitals and primary care practices.

Lisa A. Cooper is the James F. Fries Professor of Medicine and Director of The Johns Hopkins Center to Eliminate Cardiovascular Health Disparities at Johns Hopkins University School of Medicine. A general internist, social epidemiologist, and health services researcher, her research focuses on the effectiveness of multi-level interventions enhancing patient-physician communication, quality of primary care, and community engagement to improve cardiovascular outcomes and reduce healthcare disparities.