

Community Health Workers, Access to Care, and Service Utilization Among Florida Latinos: A Randomized Controlled Trial

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Objectives. To determine whether a 1-year community health worker intervention improves access to care and service utilization among Latinos with diabetes.

Methods. We conducted a single-blind randomized trial of 300 adults with poorly controlled diabetes treated in 2 public hospital clinics in Miami, Florida. We began enrollment in 2010 and completed follow-up in 2015. We examined access and utilization using self-reported measures and data from electronic medical records.

Results. Participants randomized to the community health worker intervention self-reported fewer problems accessing needed care and prescriptions than did those in the usual care group (30% vs 43% and 28% vs 41%, respectively; $P < .05$ for both). Adjusting for age, gender, education, depression, and comorbidities showed similar results (odds ratio [OR] = 0.52; 95% confidence interval [CI] = 0.29, 0.93 and OR = 0.45; CI = 0.24, 0.82, respectively). We found no significant utilization differences in primary care visits, emergency department utilization, or hospitalization between the 2 groups.

Conclusions. Among Latinos with poorly controlled diabetes, a 1-year community health worker intervention was associated with improvements in self-reported access to care but not service utilization. (*Am J Public Health*. 2018;108:1249–1251. doi: 10.2105/AJPH.2018.304542)

Community health workers (CHWs) are integral members of the public health workforce.¹ CHWs play a variety of roles, including assisting with care coordination and monitoring for complications as well as assisting in education and behavior change.² Previous studies demonstrate that CHWs improve outcomes for patients with chronic health conditions such as diabetes.^{3,4} However, there is little research using an experimental design that studies the impact of CHWs on access and utilization among patients with diabetes.^{2,5} To describe the role of CHWs on access to care and utilization, we present findings from the Miami Healthy Heart Initiative, a randomized trial of a 1-year CHW intervention among Latinos with poorly controlled diabetes that improved diabetes control, with a hemoglobin A1c (HbA1c) reduction of 0.5%.⁶

METHODS

The Miami Healthy Heart Initiative was a 52-week, single-blind, randomized clinical trial of 300 Latino adults treated in 2 outpatient clinics of a public hospital in Miami, Florida.⁷ Carrasquillo et al. provide details of this initiative.⁷ We began enrollment on July 1, 2010, and completed follow-up on January 31, 2015. Eligible participants had an HbA1c level of 8.0% or greater. All patients underwent a baseline survey and laboratory evaluation.

We randomized patients to usual care or a 1-year CHW community-based intervention that included health education, counseling, navigation assistance, social services,

and social support. On average, CHW patients received a median of 4 home visits and 20 telephone calls. At 1 year, some patients in the usual care (31%) and CHW (26%) groups were lost to attrition ($P = .37$). We report data from the 215 patients with follow-up.

Measures

We report self-reported access to care over the past 12 months at exit interview, including inability to obtain care, obtain prescriptions, contact doctor when needed, or communicate with providers in their preferred language. We used questions derived from the Medical Expenditures Panel Survey to assess the self-reported number of outpatient visits and hospitalizations.⁸ We also reviewed the electronic medical record (EMR) to extract data on health care utilization, including primary care clinic visits (including diabetes clinic), inpatient hospitalizations, and emergency department (ED) visits in the study year and the previous year.

Statistical Analysis

We examined categorical outcomes using χ^2 analysis, and we used logistic regression models to adjust for age, gender, education, depression, and comorbidities. We evaluated self-reported and EMR utilization outcomes using the Wilcoxon Rank Sum test. We used generalized estimating equations to compare data on the median number of outpatient visits, percentage inpatient hospitalizations,

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At the time of the study, all of the authors were with the University of Miami, Miami, FL.

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This article was accepted May 12, 2018.

doi: 10.2105/AJPH.2018.304542

and ED visits from the year before the intervention year. We set statistical significance at $\alpha = 0.05$. We performed analyses using SPSS version 22 (IBM SPSS Statistics, Armonk, NY) and SAS version 9.2 (SAS Institute, Cary, NC).

RESULTS

Patients in both groups had similar distribution with respect to age (55 ± 7 years in both groups), gender (both groups 45% male), and years of education, measured as percentage with less than 12 years of education (41% in CHW group and 43% in usual care group). At 1 year, we found statistically significant differences in 2 of the 4 self-reported access to care measures (Table 1). Among participants in the CHW group, 30% reported inability to access care, compared with 43% in the usual care group ($P = .04$). Additionally, 28% of the participants in the CHW group reported inability to access medications, compared with 41% in the usual care group ($P = .03$). These differences persisted after adjustment for age, gender, education, depression, and comorbidities (odds ratio [OR] = 0.52; 95% confidence interval [CI] = 0.29, 0.93 and (OR = 0.45; 95% CI = 0.24, 0.82, respectively).

Participants self-reported a median of 7 encounters with the health care system, and 28% had an inpatient stay during the study

year. The CHW and usual care group had similar self-reported rates of service utilization. EMR-derived utilization data in the CHW versus usual care group indicated a median of 3 versus 2 outpatient visits, 15% versus 17% had an inpatient stay, and 57% versus 70% had an ED visit. These comparisons were not statistically significant. Additionally, there were no significant changes in outpatient visits, inpatient stays, or ED visits between study years.

DISCUSSION

In this study of Latinos with poorly controlled diabetes, we found that CHW group patients self-reported fewer problems obtaining needed care and medications. These results remained robust after multivariate adjustment. However, we did not find any significant difference in utilization between groups when we used measures from self-reported data or EMR data. Data from research using an experimental study design to examine the impact of CHWs on access and utilization have been limited.^{9,10} A randomized study among hospitalized patients showed that CHWs improved postdischarge primary care visits but did not reduce readmissions.⁵ Our findings add to this literature, with a specific focus on Latinos with diabetes. Perhaps improved access to care will lead to sustained changes in service utilization;

longer follow-up is needed to determine this. Additional, longer-term research on CHWs in Latino populations is needed.

We hypothesize various approaches through which our CHWs improved access to health care. CHWs maintained regular contact with medical staff to facilitate communication and appointment scheduling.¹¹ CHWs also informed patients of local pharmacies with low-cost generic medications. These CHW activities may be responsible for improved access to some aspects of care and may be important elements to emphasize in CHW trainings.

There are several caveats that need to be considered. First, our attrition rate was 27%. To address this limitation, we also examined EMR data from all 300 patients enrolled and found no significant differences in service utilization. We also found discrepancies between self-reported and EMR utilization data. Although self-reported measures may be subject to recall bias, they allow us to examine utilization data not captured by the EMR, such as care received at other facilities not part of the public hospital system. Lastly, our study was not adequately powered to examine inpatient days and ED visits.

PUBLIC HEALTH IMPLICATIONS

In the United States, diabetes affects 30.3 million people (9.4% of the population), with costs estimated at \$245 billion.¹² We found that a CHW intervention among Latinos with diabetes resulted in improvements in self-reported access to care. These findings add to the growing body of knowledge showing that CHWs are key members of the public health workforce that addresses diabetes. However, we did not find improvements in service utilization. The effect of CHWs on service utilization may vary depending on the infrastructure of the health system where the CHW program is implemented. Additional research is needed to determine whether such findings are consistent in other settings and among other populations. **AJPH**

CONTRIBUTORS

A. Chang and O. Carrasquillo designed and performed the analysis and wrote the article. E. Patberg, V. Cueto, and B. Singh selected validated measures and performed data collection and database management. H. Li

TABLE 1—Self-Reported Access to Health Care and Utilization in the Past 12 Months: Miami Healthy Heart Initiative; Miami, FL; 2010–2015

Characteristic	Usual Care (n = 104), % or No. (IQR)	Intervention (n = 111), % or No. (IQR)
Unable to access needed care*	43	30
Unable to obtain necessary prescriptions*	41	28
Unable to communicate with provider in language of choice	0	2
Found it somewhat difficult to contact doctor ^a	78	72
Self-reported utilization		
Outpatient visits	7.0 (9.0)	8.0 (8.0)
Proportion with inpatient stay	32	24

Note. IQR = interquartile range.

^an = 80 in the control group and 83 in the intervention group because some patients reported that they did not try to contact the doctor.

* $P < .05$.

performed the statistical analysis. S. Kenya, Y. Alonzo, and O. Carrasquillo planned and executed the clinical trial.

ACKNOWLEDGMENTS

We would like to thank the University of Miami, the community health workers, and the patients who participated in this study.

HUMAN PARTICIPANT PROTECTION

We obtained institutional review board approval from the University of Miami.

REFERENCES

1. Pérez LM, Martínez J. Community health workers: social justice and policy advocates for community health and well-being. *Am J Public Health*. 2008;98(1):11–14. [Erratum in *Am J Public Health*. 2010;100(10):1826]
2. Norris SL, Chowdhury FM, Van Le K, et al. Effectiveness of community health workers in the care of persons with diabetes. *Diabet Med*. 2006;23(5):544–556.
3. Kim K, Choi JS, Choi E, et al. Effects of community-based health worker interventions to improve chronic disease management and care among vulnerable populations: a systematic review. *Am J Public Health*. 2016;106(4):e3–e28.
4. Palmas W, March D, Darakjy S, et al. Community health worker interventions to improve glycemic control in people with diabetes: a systematic review and meta-analysis. *J Gen Intern Med*. 2015;30(7):1004–1012.
5. Kangovi S, Mitra N, Grande D, Huo H, Smith RA, Long JA. Community health worker support for disadvantaged patients with multiple chronic diseases: a randomized clinical trial. *Am J Public Health*. 2017;107(10):1660–1667.
6. Carrasquillo O, Lebron C, Alonzo Y, Li H, Chang A, Kenya SA. Effect of a community health worker intervention among Latinos with poorly controlled type 2 diabetes: the Miami Healthy Heart Initiative Randomized Clinical Trial. *JAMA Intern Med*. 2017;177(7):948–954.
7. Carrasquillo O, Patberg E, Alonzo Y, Li H, Kenya S. Rationale and design of the Miami Healthy Heart Initiative: a randomized controlled study of a community health worker intervention among Latino patients with poorly controlled diabetes. *Int J Gen Med*. 2014;7:115–126.
8. Cohen J. *Design and Methods of the Medical Expenditure Panel Survey Household Component*. Rockville, MD: Agency for Health Care Policy and Research; 1997.
9. Verhagen I, Steunenberg B, de Wit NJ, Ros WJ. Community health worker interventions to improve access to health care services for older adults from ethnic minorities: a systematic review. *BMC Health Serv Res*. 2014;14:497.
10. Shah MK, Heisler M, Davis MM. Community health workers and the Patient Protection and Affordable Care Act: an opportunity for a research, advocacy, and policy agenda. *J Health Care Poor Underserved*. 2014;25(1):17–24.
11. Lebron CN, Reyes-Arrechea E, Castillo A, Carrasquillo O, Kenya S. Tales from the Miami Healthy Heart Initiative: the experiences of two community health workers. *J Health Care Poor Underserved*. 2015;26(2):453–462.
12. Centers for Disease Control and Prevention. *National Diabetes Statistics Report, 2017*. Atlanta, GA: US Department of Health and Human Services; 2017.