

# Feasibility of a Church-Based, CHW-Delivered Diabetes and SDOH Intervention in a Hispanic Community: A Quasi-Experimental Study



Elizabeth M. Vaughan, DO, MPH<sup>1,2</sup> , Saad Nadeem, MBA, MHA<sup>3</sup>,  
Ashok Balasubramanyam, MD<sup>2</sup>, Craig A. Johnston, PhD<sup>4</sup>,  
Patricia Rodriguez Espinosa, PhD, MPH<sup>5</sup>, Mukaila Raji, MD<sup>1</sup>, Aanand D. Naik, MD<sup>6,7</sup>,  
Gabriela A. Gallegos, JD<sup>6</sup>, and Laura R. Porterfield, MD<sup>8</sup>

<sup>1</sup>Department of Internal Medicine, University of Texas Medical Branch, Galveston, TX, USA; <sup>2</sup>Department of Medicine, Baylor College of Medicine, Houston, TX, USA; <sup>3</sup>College of Medicine, Texas A&M, College Station, TX, USA; <sup>4</sup>Department of Health and Human Performance, University of Houston, Houston, TX, USA; <sup>5</sup>Department of Epidemiology and Population Health, Stanford Medicine, Palo Alto, CA, USA; <sup>6</sup>Department of Management, Policy, and Community Health, University of Texas School of Public Health, Houston, TX, USA; <sup>7</sup>Center for Innovations in Quality, Effectiveness and Safety, Michael E. DeBakey VA Medical Center, Houston, TX, USA; <sup>8</sup>Department of Family Medicine, University of Texas Medical Branch, Galveston, TX, USA

## ABSTRACT

**BACKGROUND:** Social determinants of health (SDOH) screenings have identified disproportionate inequities in Hispanic populations that increase diabetes risk, yet they rarely lead to interventions. Churches are trusted community hubs with the potential to address health needs; however, partnerships with Hispanic churches remain largely unexplored.

**OBJECTIVE:** To assess the feasibility of a church-based, community health worker (CHW)-led program to identify and address SDOH inequities in a Hispanic community.

**DESIGN:** Pilot quasi-experimental feasibility study

**PARTICIPANTS:** Forty-seven Hispanic adults, predominantly women (74.5%), with a mean age of 51 years

**INTERVENTIONS:** Five church congregants obtained CHW state certification (160-h course) and received training in teaching skills, diabetes self-management, and SDOH. With ongoing mentoring, CHWs led a 6-month diabetes prevention and self-management program with monthly in-person education and weekly mHealth coaching focused on addressing SDOH inequities in the healthcare access and quality domain.

**MAIN MEASURES:** Feasibility was assessed across eight pre-established variables (integration, expansion, demand, implementation, limited efficacy, acceptability, practicality, and adaptation), including CHWs' ability to address SDOH inequities such as insurance coverage, established medical home, primary care utilization, eye exams, medication access, and glucose monitoring.

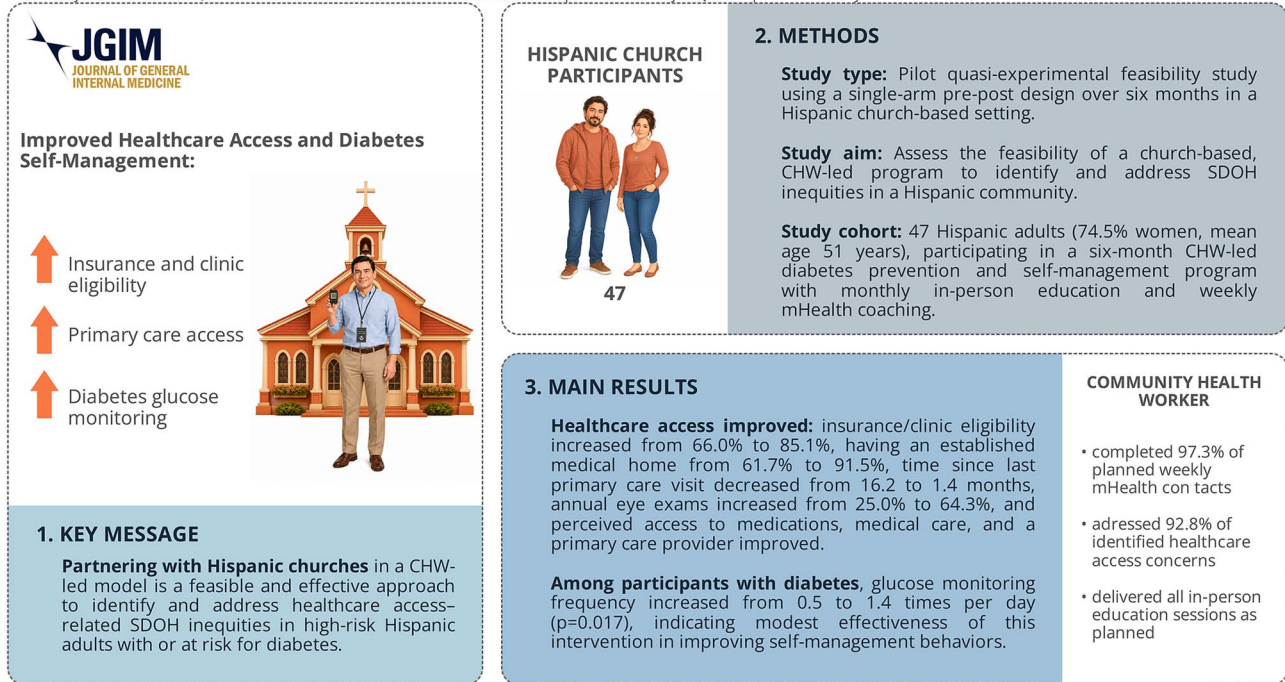
**KEY RESULTS:** CHWs completed 97.3% of planned weekly mHealth contacts, identified and addressed 92.8% of participant concerns, and conducted all in-person education sessions per protocol. Healthcare access improved significantly: insurance coverage/clinic eligibility (66.0 to 85.1%;  $p=0.025$ ), established medical home (61.7 to 91.5%;  $p<0.0001$ ), time since last primary care visit (16.2 to 1.4 months;  $p=0.017$ ), and annual eye exams (25.0 to 64.3%;  $p<0.0001$ ). On a 5-point Likert scale, participants increased access to medications ( $\Delta=0.54$ ;  $p=0.03$ ), medical care ( $\Delta=0.67$ ;  $p=0.012$ ), and a primary care provider ( $\Delta=0.79$ ;  $p=0.009$ ). Among participants with diabetes, glucose monitoring increased from 0.5 to 1.4 times daily ( $p=0.017$ ).

**CONCLUSIONS:** Findings support the feasibility of partnering with Hispanic churches to both identify and address healthcare access SDOH inequities.

## Graphical Abstract

Vaughan EM et al. | *Journal of General Internal Medicine*

Feasibility of a Church-Based, CHW-Delivered Diabetes and SDOH Intervention in a Hispanic Community: A Quasi-experimental Study



Abbreviations: Community Health Worker (CHW); Social Determinants of Health (SDOH);

Creative Commons License BY-ND 4.0

**KEY WORDS:** diabetes; Hispanics or Latin(o)(a)s; church or faith-based; telehealth or mHealth; community health worker

J Gen Intern Med

DOI: 10.1007/s11606-026-10668-0

© The Author(s) 2026

## INTRODUCTION

Social determinants of health (SDOH) are the conditions in which people are born, grow, live, and work, along with broader environmental factors shaping daily life.<sup>1,2</sup> Healthy People 2030 outlines five SDOH domains: healthcare access and quality (HAQ), education access and quality, social/community context, neighborhood and built environment, and economic stability.<sup>3</sup> SDOH inequities drive health disparities, including diabetes, disproportionately affecting minority populations.<sup>1,2</sup> Hispanic populations in particular experience higher rates of diabetes and related complications, reflecting these inequities; accordingly, the CDC recognizes Hispanic ethnicity as an independent risk factor for diabetes.<sup>3,4</sup>

Studies have developed SDOH screening tools, particularly following Centers for Medicare & Medicaid Services and Joint Commission requirements for hospital-based screening.<sup>5,6</sup> However, most focus on non-HAQ domains, such as food insecurity (91%), part of the economic stability domain.<sup>7,8</sup> Although diabetes is linked to SDOH inequities, existing tools often fail to capture the needs of those at risk

or affected.<sup>9</sup> Further, while screening for SDOH needs is well established,<sup>10,11</sup> a critical gap remains between identifying needs and delivering effective interventions.<sup>12,13</sup> A systematic review (1980–2023) identified 30 studies assessing SDOH; only 18 proposed interventions, and none addressed HAQ-related SDOH.<sup>9</sup> This gap reflects the structural complexity of HAQ-related SDOH beyond traditional clinical care and barriers, such as limited trust, care navigation challenges, and lack of culturally tailored support.<sup>14</sup>

Community-based collaboration with trusted local partners offers a strategy to address this gap.<sup>15</sup> Faith-based institutions, such as churches, often serve as key access points for individuals who may be unaware of their health needs or who need support navigating care.<sup>16</sup> Beyond this role, churches address broader unmet social needs, including housing or food insecurity. Churches provide a framework for communities to share responsibility for health promotion while offering potential long-term infrastructure<sup>17,18</sup> and often maintain substantial volunteer networks that can support sustained community-based interventions.<sup>19</sup>

This potential is amplified when churches partner with community health workers (CHWs), local lay leaders who bridge communities to healthcare systems.<sup>20</sup> CHW programs are particularly impactful in underserved communities by leveraging trusted relationships, cultural alignment, and lived experience to reduce barriers to care and improve engagement.<sup>17,21</sup> Prior studies demonstrate that church congregants can be successfully trained as CHWs in interventions among

non-Hispanic Black adults. A systematic review of 15 studies ( $n = 2285$ ) found that ~80% incorporated CHWs.<sup>22–24</sup> Another study utilized CHWs in a program targeting hypertension; ongoing training and support ensured CHWs maintained intervention fidelity.<sup>25</sup>

However, research in Hispanic congregations remains limited, as most CHW church interventions have been conducted in non-Hispanic Black congregations, highlighting a gap in evidence and practice.<sup>26</sup> Church-based health initiatives may be especially promising for Hispanic communities, where churches are longstanding hubs of trust and social connection.<sup>27</sup> Since 2015, our team has used a clinic-based mentoring model to train CHWs for diabetes management interventions in Hispanic communities, resulting in improved and sustained outcomes.<sup>28–31</sup> To extend reach to individuals with limited healthcare access or who are unaware of medical needs, this study adapted our clinic-based model to a church-based setting, training congregants to serve as CHWs.

This 6-month pilot study assessed the feasibility of a Hispanic church-based, CHW-delivered diabetes prevention and self-management intervention focused on addressing HAQ-related SDOH inequities. Church congregants were certified as CHWs and mentored to deliver the interventions. We hypothesized that the program would demonstrate feasibility, advancing the field by partnering with Hispanic churches to show an expansion of CHWs' role beyond system navigation to actively address SDOH, supporting scalable church-based health interventions.

## METHODS

### Study Design and Setting

This 6-month pilot quasi-experimental feasibility study used a single-arm pre–post design to evaluate a Hispanic church-based diabetes and SDOH intervention. Here, “feasibility study” refers broadly to research that informs future full-scale trials.<sup>32</sup> All participants provided informed consent. The study was approved by IRB #23–0169 and registered at ClinicalTrials.gov (#NCT05965869).

### Theoretical Framework

Community-based participatory research (CBPR) principles, including shared decision-making, long-term commitment, and trust building, informed the intervention to ensure collaboration between researchers and community partners. Principles were applied across all research phases, such as assessment, design, implementation, analysis, dissemination, and translation into action.<sup>33</sup> Planning meetings identified church partner goals (e.g., increasing community presence), and post-intervention feedback highlighted the need for regular communication (e.g., monthly meetings).

## CHWs and Participants

**CHWs.** Our team asked church leadership to identify 4–6 CHW candidates and assist with outreach and initial screening (availability, willingness to train, role fit). Consistent with standard definitions, CHWs were trusted community members familiar with local needs.<sup>23</sup> For this study, CHWs were Hispanic, Spanish-speaking, and contributed ~4 h/week; in-line with Hispanic church norms, where most roles are volunteer-based, CHWs were unpaid (gas reimbursed). Tablets with video and microphone capabilities were provided for CHW use.

**Participants.** Eligible participants were self-identified Hispanic adults ( $\geq 18$  years) who spoke Spanish and lived near the host church. Exclusions included pregnancy (due to a likely increase healthcare utilization that could bias outcomes), type 1 diabetes, and no interaction with CHWs (e.g., no-show/unreachable). Recruitment occurred 1 month prior to baseline via church events, flyers, and word-of-mouth, including promotion by church leadership. Bilingual research staff screened eligibility (phone or in person) and obtained verbal consent using an IRB-approved script.

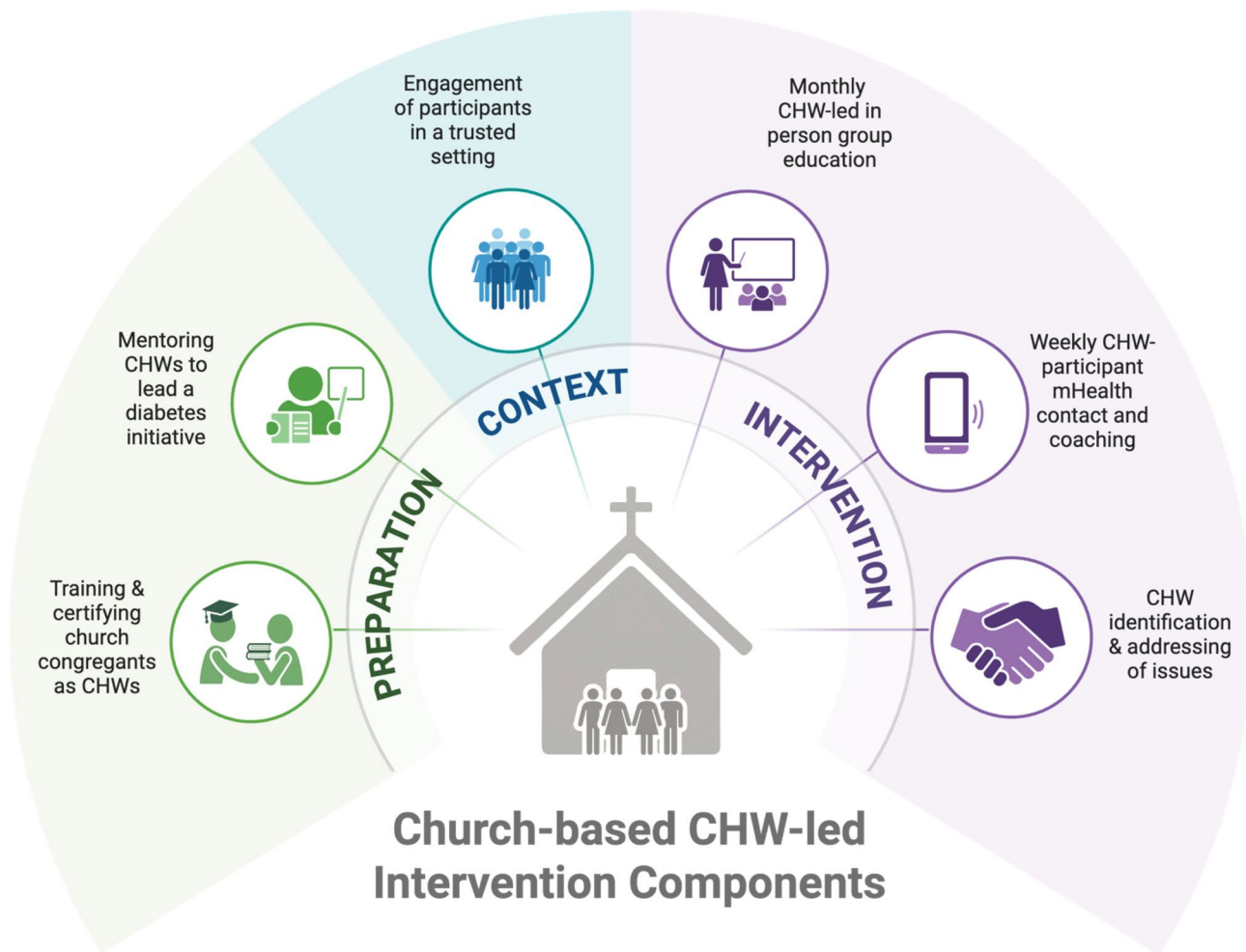
## Research Team

The team consisted of investigator scientists and six CHW instructors. CHW instructors provided the required state CHW certification (160 h)<sup>34</sup> and training (diabetes, SDOH) for 35 h, along with weekly mentoring through individual (phone, text) and group (videoconferencing) sessions. All training was in Spanish. Instructors attended group education sessions for support and fidelity monitoring; to reduce power dynamics, only one team member attended for half of the sessions.

## Intervention

The intervention used our clinic-based model as a template for structure, curriculum, and CHW mentoring.<sup>28–30</sup> For 6 months, participants engaged in (1) monthly group education and (2) weekly CHW—participant mobile health (mHealth) coaching and support. Figure 1 summarizes the components. All materials and education were in Spanish.

**Group Education.** CHWs led monthly, 1-h in-person Saturday sessions at the church. Session attendance was optional to avoid excluding participants with schedule conflicts or those who did not wish to attend group sessions. The curriculum covered guideline-based diabetes prevention and self-management and structured SDOH resource navigation;<sup>28,29</sup> CHWs distributed glucometers (month 1) and trained participants on their use and glucose targets. To reinforce learning, CHWs texted two short



**Figure 1** Components of the church-based Community Health Worker (CHW)-led intervention. Preparation: included providing church congregants the required state certification course to become CHWs (160 h),<sup>34</sup> delivering intervention training (35 h), weekly mentoring through individual (phone, text) and group (videoconferencing) sessions, and observation by the research team of monthly CHW-led education classes.

(~20-min) educational YouTube videos monthly, created by the research team and aligned with each topic.

**mHealth Contact and Coaching.** CHWs contacted assigned participants weekly via mHealth (text or phone, per participant preference) to (1) provide coaching on healthy living (e.g., lifestyle modification, goal setting) and (2) address HAQ-related SDOH concerns (e.g., supplies, appointments, insurance) identified on the baseline survey and during the intervention, including facilitating connections to community services. Text messaging used secure platforms and was limited to non-identifiable information to protect privacy, and CHW-participant interactions were documented in a secure, online team spreadsheet.

**Screening and Addressing SDOH Needs.** Existing SDOH screening tools have limited coverage of the HAQ domain and are not tailored to diabetes-specific needs. SDOH inequities increase chronic disease risk; Hispanic populations

experience a disproportionate burden of these inequities and higher diabetes rates. To address this gap, we developed a diabetes-focused bilingual (Spanish/English) SDOH survey using a CBPR approach with community partners and IRB-approved language services to capture upstream SDOH relevant to prevention and management in this high-risk population. Survey items were adapted from Healthy People 2030 objectives.<sup>3</sup> Given variability in insurance and healthcare systems, our research team worked with CHWs to develop a resource list of clinics and services, including eligibility criteria (insurance vs. county-funded), to support individualized referrals.

### Adaptations from the Clinic-Based Model

The church-based model was adapted from our clinic-based program using a CBPR-informed approach, with input from CHWs, community stakeholders, and church partners. Both models included in-person diabetes education and weekly CHW-participant mHealth contact. Key

**Table 1 Areas of Focus and Outcomes for Feasibility Study Evaluating a Diabetes and Social Determinants of Health (SDOH) Intervention in Hispanic Churches<sup>32</sup>**

| Focus            | Definition                                                                                                   | Question(s) asked                                                                              | Outcomes                                                                                                                                                                                                                                            |
|------------------|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Integration      | Evaluates system changes needed to embed the intervention and whether resulting changes support feasibility. | Can the program be incorporated into an existing system?                                       | <ul style="list-style-type: none"> <li>Ability to recruit, certify, and train church congregants as CHWs</li> </ul>                                                                                                                                 |
| Expansion        | Assesses potential success when applying an effective intervention to new populations or settings.           | Can a tested program be extended to reach new populations?                                     | <ul style="list-style-type: none"> <li>Proportion of anticipated vs. actual participants recruited</li> </ul>                                                                                                                                       |
| Demand           | Evaluates expected or actual use of the intervention within a target population or setting.                  | How likely is the program to be used?                                                          | <ul style="list-style-type: none"> <li>Anticipated* vs. actual CHW-participant mHealth contact, including communication mode (text, call, both, unknown, no contact)</li> <li>In-person session attendance</li> </ul>                               |
| Implementation   | Examines how well and in what ways the intervention can be carried out as intended.                          | Can the program be successfully delivered in a real-world setting?                             | <ul style="list-style-type: none"> <li>Identification of healthcare access barriers (baseline survey, 18-items Likert scale)<sup>3</sup></li> </ul>                                                                                                 |
| Limited efficacy | Tests the intervention on a small scale using limited samples, outcomes, or follow-up.                       | Is the program likely to succeed with the intended population under controlled conditions?     | <ul style="list-style-type: none"> <li>CHWs' ability to address healthcare access barriers (exit survey, 18-items Likert scale)<sup>3</sup></li> </ul>                                                                                              |
| Acceptability    | Examines how target participants and implementers perceive and respond to the intervention.                  | How suitable, appealing, or satisfactory is the program to deliverers and recipients?          | <ul style="list-style-type: none"> <li>Satisfaction surveys for participants (exit survey, 9 items: Likert scale, open-ended) and CHWs (DSHS CHW Satisfaction and Evaluation Survey, 15 items: Likert scale, open-ended)<sup>29,34</sup></li> </ul> |
| Practicality     | Assesses whether the intervention can be delivered under real-world constraints (e.g., time, resources).     | Can the program be carried out with available resources and participants without outside help? | <ul style="list-style-type: none"> <li>CHWs identify new healthcare access concerns during the intervention<sup>3</sup></li> <li>CHWs lead in-person sessions without the research team's presence</li> </ul>                                       |
| Adaptation       | Focuses on modifying the intervention to fit new contexts, populations, or formats.                          | How well does a program or process perform in a new format or with a different population?     | <ul style="list-style-type: none"> <li>Program previously implemented in clinics for 10 years, now delivered in churches; compared satisfaction and abilities to recruit both CHWs and participants<sup>28,29</sup></li> </ul>                      |

\*Anticipated contact frequency was once per week. Actual contact was coded as yes/no based on whether the CHW reached the participant; multiple contacts within the same week were counted as one

CHW, community health worker; DSHS, Department of State Health Services; mHealth, mobile health; SDOH, social determinants of health

adaptations included a prevention emphasis in the church model—broadening reach to individuals without access to care and those at risk for diabetes and focused on SDOH. In contrast, the clinic-based model was treatment-focused, including individuals with established diabetes receiving clinical care, emphasizing glycemic control, and requiring clinician involvement in intervention delivery.<sup>28–30</sup>

## Measures

Table 1 defines study measures across eight pre-established variables: integration, expansion, demand, implementation, limited efficacy, acceptability, practicality, and adaptation.<sup>32</sup> We compared (pre/post) changes in self-reported SDOH survey items (e.g., insurance, retinal exam, glucose supplies) from baseline to 6 months. Open-ended responses were analyzed using a structured thematic approach; two independent authors (EV, LP) coded responses and identified themes, with discrepancies resolved by consensus or a third author (CJ).

Data were recorded in an online team spreadsheet, allowing CHWs to review progress addressing participants' diabetes-related and SDOH needs and track their

ability to identify new concerns. For this pilot study, we aimed to enroll 8–10 participants per CHW, consistent with prior studies,<sup>28–31</sup> for a total target of ~45 participants. Analyses were unadjusted associations, reflecting the pilot nature of the study. Likert scale responses were treated as continuous variables and analyzed using independent-sample *t* tests, while binomial outcomes (e.g., insurance status) were analyzed with two-sample tests of proportions. Statistical significance was set at  $p < 0.05$ .

## RESULTS

### Integration

Church leadership identified five congregants to serve as CHWs. All met eligibility criteria and completed the required training. Our team certified, trained, and mentored the CHWs to lead the intervention. All CHWs were female (mean age of 52 years  $\pm$  7.9) and fluent in Spanish, with English proficiency ranging from basic ( $n = 3$ ) to intermediate ( $n = 1$ ) to fluent ( $n = 1$ ). CHWs originated from Colombia

**Table 2 Participant (n = 47) Baseline Demographic and Clinical Information**

| Variable                                | n (%)      |
|-----------------------------------------|------------|
| <b>Sex (n)—female</b>                   | 38 (74.5)  |
| <b>Ethnicity (n)</b>                    |            |
| Hispanic                                | 47 (100.0) |
| <b>Country of origin (n)</b>            |            |
| Argentina                               | 2 (4.3)    |
| Bolivia                                 | 3 (6.4)    |
| Colombia                                | 5 (10.7)   |
| Cuba                                    | 1 (2.1)    |
| Dominican Republic                      | 1 (2.1)    |
| El Salvador                             | 4 (8.5)    |
| Honduras                                | 1 (2.1)    |
| Mexico                                  | 2 (4.3)    |
| Puerto Rico                             | 1 (2.1)    |
| Peru                                    | 1 (2.1)    |
| Venezuela                               | 23 (48.9)  |
| Unknown                                 | 3 (6.4)    |
| <b>Employment (n)</b>                   |            |
| Domestic                                | 18 (38.3)  |
| Manual labor or food service            | 6 (12.8)   |
| Medical                                 | 1 (2.1)    |
| Business                                | 10 (21.3)  |
| Unemployed                              | 4 (8.5)    |
| Other/unknown                           | 8 (17.0)   |
| <b>Highest education attainment (n)</b> |            |
| Some primary                            | 1 (2.1)    |
| Completed primary                       | 2 (4.3)    |
| Some high school                        | 3 (6.4)    |
| Completed high school                   | 16 (34.0)  |
| Some college                            | 4 (8.5)    |
| Completed college                       | 21 (44.7)  |
| <b>Contact day preferences (n)</b>      |            |
| Weekday                                 | 37 (78.7)  |
| Weekend                                 | 4 (8.5)    |
| <b>Church attendance (n)</b>            |            |
| At host church                          | 28 (59.6)  |
| At another church                       | 4 (8.5)    |
| None                                    | 12 (25.2)  |
| <b>Diabetes therapy (n = 9)</b>         |            |
| Oral only treatment                     | 8 (88.9)   |
| Injection only                          | 0 (0.0)    |
| Injection and oral                      | 1 (11.1)   |
| <b>Medical history (n)</b>              |            |
| Obesity/overweight                      | 37 (78.7)  |
| Fasting blood sugar > 100               | 8 (17.0)   |
| Gestational diabetes                    | 2 (4.3)    |
| Family history of diabetes              | 30 (63.8)  |
| Physical activity < 3 times weekly      | 22 (46.8)  |

(n = 2), Argentina (n = 1), Mexico (n = 1), and Venezuela (n = 1). Two CHWs had a diabetes, while three did not.

## Expansion

A total of 109 individuals were approached for enrollment. Of these, 3% (n = 4) were not reached and 50% (n = 54) declined participation. The most common reasons for declining were lack of interest (20%, n = 11), work or scheduling conflicts (15%, n = 8), and unknown reasons (65%, n = 35). Of the 51 enrolled participants, four were excluded due to no CHW contact, resulting in 47 participants and achieving the recruitment target (n = 40–50). The mean participant age was 51 years.

Table 2 shows participant demographics and baseline characteristics. Most participants were women and nearly half were Venezuelan, with the remainder from other Latin American countries. Among participants, 19.1% reported a diabetes diagnosis, primarily treated with oral medications. All others were considered at risk based on CDC criteria for Hispanic ethnicity.<sup>4</sup> Most self-reported overweight or obesity, and many reported a family history of diabetes. Nearly half engaged in physical activity < 3 times/week. More than one-third worked in domestic jobs and more than half had completed some or all college. Most attended the host church; the majority preferred weekday contact with CHWs.

## Demand

A total of 1021 participant–CHW mHealth contacts related to diabetes care were planned, of which 993 were completed, yielding a 97.3% completion rate. Among these contacts, 50.4% (n = 500) were text messages, 23.0% (n = 228) were a combination of calls and texts, 20.4% (n = 203) were phone calls, and 6.2% (n = 62) were of unknown type. Class attendance exceeded the 10–20% target, ranging from 13 to 59% across six sessions. The highest turnout occurred in the final session, and the lowest in the second-to-last session. On average, three participant supporters (family members or friends) attended each session.

## Implementation

A total of 111 healthcare access concerns were identified in the baseline survey (Table 3). The most common concern was ophthalmology appointments (28.8%, n = 32), followed by other appointments (16.2%, n = 18), diabetes supplies (14.4%, n = 16), insurance and/or clinic eligibility (13.5%, n = 15), clinic-related issues (13.5%, n = 15), glucose abnormalities (9.0%, n = 10), medications (1.8%, n = 2), and other concerns (2.7%, n = 3).

## Limited Efficacy

Of the 111 healthcare access concerns identified at baseline, CHWs addressed 92.8% (n = 103) (Table 3). Health insurance and clinic eligibility coverage increased from 66.0 to 85.1% (p = 0.025) following CHW assistance with county health system registration or connections to insurance providers. The proportion reporting a medical home increased from 61.7 to 91.5% (p < 0.0001). Receipt of an eye exam within the past year improved from 25.0 to 64.3% (p < 0.0001) after participants received information on locations offering diabetes eye exams.

The average time from last primary care visit decreased from 16.2 to 1.4 months (p = 0.017); the proportion of participants without a primary care visit in the past 12 months decreased from 28% at baseline to 5% (p = 0.02). On a 5-point Likert scale, participants increased access to

**Table 3 Participant (*n* = 47) Entry vs. Exit Survey Data Addressing the Healthcare and Quality (HAQ) Domain of the Social Determinants of Health (SDOH)**

| Variable                                                                               | Entry<br><i>n</i> (%) | Exit<br><i>n</i> (%) | <i>p</i> -value |
|----------------------------------------------------------------------------------------|-----------------------|----------------------|-----------------|
| Health insurance/clinic eligibility                                                    | 31 (66.0)             | 42 (85.1)            | 0.025           |
| Medical home                                                                           | 29 (61.7)             | 43 (91.5)            | <0.0001         |
| Daily medications prescribed                                                           | 43 (91.5)             | 39 (83.0)            | 0.800           |
| Daily medications taken                                                                | 40 (85.1)             | 35 (74.5)            | 0.731           |
| Eye exam in the last 12 months                                                         | 14 (25.0)             | 36 (64.3)            | <0.0001         |
| Diabetes diagnosis                                                                     | 9 (19.2)              | 12 (25.5)            | 0.462           |
| Check glucose (if with diabetes diagnosis)                                             | 4 (8.5)               | 16 (34.0)            | <0.0001         |
| Need diabetes supplies e.g., glucometer, lancets                                       | 11 (23.4)             | 9 (19.2)             | 0.580           |
| Variable                                                                               | Entry<br>mean (SD)    | Exit<br>mean (SD)    | <i>p</i> -value |
| Weekly glucose checks (participants with diabetes only)                                | 3.6 (5.2)             | 2.5 (1.9)            | 0.403           |
| Daily glucose checks (participants with diabetes only)                                 | 0.5 (0.7)             | 1.4 (1.0)            | 0.017           |
| Time since last primary care appointment (months)                                      | 16.2 (37.6)           | 1.4 (4.3)            | 0.017           |
| Likert scale from 1 to 5 (mean, SD), where 1 = strongly disagree to 5 = strongly agree |                       |                      |                 |
| I have good health                                                                     | 3.91 (1.2)            | 3.96 (1.2)           | 0.860           |
| I can obtain needed medications                                                        | 4.09 (1.4)            | 4.63 (0.8)           | 0.028           |
| I have access to medical care                                                          | 3.96 (1.6)            | 4.63 (0.9)           | 0.012           |
| I have a primary care provider                                                         | 3.78 (1.7)            | 4.57 (1.0)           | 0.009           |
| I speak about health with my family and friends                                        | 3.54 (1.5)            | 4.04 (1.3)           | 0.100           |
| Spirituality affects how I take care of my health                                      | 4.26 (1.0)            | 4.52 (0.9)           | 0.200           |
| My spiritual or religious community supports me                                        | 4.07 (1.2)            | 4.07 (1.4)           | 1.000           |

medications ( $\Delta = 0.54$ ;  $p = 0.03$ ), medical care ( $\Delta = 0.67$ ;  $p = 0.012$ ), and a primary care provider ( $\Delta = 0.79$ ;  $p = 0.009$ ). No other significant pre–post differences were observed across the remaining survey items. Among participants with diabetes, glucose monitoring frequency increased significantly ( $p < 0.0001$ ), from 0.5 to 1.4 times per day ( $p = 0.017$ ).

## Acceptability

Participant satisfaction was uniformly high (Table 4). Participants increased awareness of diabetes ( $4.9/5.0 \pm 0.42$ ), healthy eating ( $4.9/5.0 \pm 0.34$ ), and self-management confidence ( $4.7/5.0 \pm 0.49$ ). CHW calls and texts enhanced participant medical care ( $4.8/5.0 \pm 0.47$ ), and the program improved quality of life ( $4.6/5.0 \pm 0.64$ ); participants were highly likely to recommend the program ( $5.0/5.0 \pm 0.21$ ). Open-ended responses underscored the value of personalized CHW support, communication, health awareness, and emotional and spiritual encouragement. Participants provided suggestions for additional activities and continued long-term programs.

CHW satisfaction was high across all measures (mean of  $5.4/6.0 \pm 0.08$ ), ranging from  $5.2/6.0 (\pm 0.84)$  for telehealth use to  $5.6/6.0 (\pm 0.55)$  for overall rating and teaching effectiveness. Open-ended responses noted improved knowledge and confidence among CHWs in supporting participants, families, and communities. CHWs emphasized benefits of education on nutrition, physical activity, and mental and holistic health, and described strategies for applying these skills in both professional and personal contexts. Suggested improvements included time management, specific topics

(e.g., lifestyle modification), computer skills, and clearer role delineation.

## Practicality and Adaptation

In addition to the original 111 concerns, CHWs identified 36 new issues during the intervention that were not on the survey; all were addressed. The 36 new concerns included access-to-care barriers (21%), glucose control or diabetes supplies problems (15%), and other disease-related problems (65%), most of which were related to overweight or obesity. CHWs independently led 50% of in-person sessions ( $n = 3/6$ ). Compared with prior clinic-based models, this church-based intervention demonstrated comparable satisfaction and recruitment effectiveness for both CHWs and participants.<sup>28–30</sup>

## DISCUSSION

This study demonstrated the feasibility of partnering with Hispanic churches to address SDOH inequities by certifying congregants as CHWs to lead a 6-month diabetes program for Hispanics—a population at high risk for diabetes and its complications. The program improved healthcare access, including insurance coverage and clinic eligibility, eye exam completion, time since last primary care visit, and ability to obtain medications. This study advances the field by partnering with Hispanic churches to implement a community-based healthcare intervention, training congregants as CHWs, and expanding CHWs' role from passive educators to active contributors in care delivery to address SDOH inequities.

Table 4 Results of Participant Satisfaction Exit Surveys

| Likert scale from 1 to 5 (mean, SD), where 1 = strongly disagree to 5 = strongly agree |                                                                                                                                                                                                                                                                                                               | Likert scale from 1 to 5 (mean, SD), where 1 = strongly disagree to 5 = strongly agree                                                                                                                                            |
|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| I am more aware of diabetes                                                            |                                                                                                                                                                                                                                                                                                               | 4.85 (0.42)                                                                                                                                                                                                                       |
| I am more aware of how to eat healthy foods                                            |                                                                                                                                                                                                                                                                                                               | 4.87 (0.34)                                                                                                                                                                                                                       |
| I can put into practice what I learned                                                 |                                                                                                                                                                                                                                                                                                               | 4.74 (0.49)                                                                                                                                                                                                                       |
| CHWs' calls and texts improved my medical care                                         |                                                                                                                                                                                                                                                                                                               | 4.78 (0.47)                                                                                                                                                                                                                       |
| I would recommend this program to a friend or family member                            |                                                                                                                                                                                                                                                                                                               | 4.96 (0.21)                                                                                                                                                                                                                       |
| My quality of life (comfort, happiness) improved                                       |                                                                                                                                                                                                                                                                                                               | 4.63 (0.64)                                                                                                                                                                                                                       |
| Open-ended feedback grouped into key categories                                        |                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                   |
| Category                                                                               | Description                                                                                                                                                                                                                                                                                                   | Comment examples                                                                                                                                                                                                                  |
| 1. Personalized support and communication                                              | Participants deeply appreciated the personalized attention, care, and follow-up from community health workers (CHWs). They felt listened to, supported, and motivated through calls and messages.                                                                                                             | "The personalized attention from my CHW."<br>"The CHW was consistent and encouraging."<br>"The calls were motivating and informative."                                                                                            |
| 2. Learning and education                                                              | Participants learned practical information and viewed videos about diabetes, nutrition, and self-care. Many improved their habits, started exercising, or became more aware of their health and insurance options.                                                                                            | "I didn't know anything about diabetes" and "I learned to use the glucometer."<br>"I am more aware of seeking medical help."<br>"I liked the videos and the follow-up."<br>"The materials were very informative" and "practical." |
| 3. Emotional, spiritual and community support                                          | Participants valued the emotional encouragement, prayers, and sense of community. They appreciated having a safe space to share and support one another.                                                                                                                                                      | "The teachings and prayers were very meaningful."<br>"The meetings and follow-up helped me feel supported."<br>"(CHWs) helped us become aware and gave emotional support."                                                        |
| 4. Suggestions for improvement                                                         | Participants suggested improvements such as offering classes on different days/times, extending the program, adding exercise or cooking classes, and including more health topics or group activities.                                                                                                        | "Offer classes at times other than Saturdays."<br>"Add exercise and recipe classes."<br>"Make the program longer."                                                                                                                |
| 5. Overall satisfaction                                                                | Many participants expressed high satisfaction with the program, describing it as life-changing, helpful, and motivating. Several asked for it to continue.                                                                                                                                                    | "Everything was excellent."<br>"Please continue the program."<br>"Keep running it—it saved my life."                                                                                                                              |
| Highlighted participant example                                                        | <i>A participant enrolled to support her spouse in the program. Through the intervention, CHWs helped reactivate her insurance, and she scheduled an annual exam. During the exam and follow-up testing, she was found to have breast cancer. Connection to insurance was key to detection and treatment.</i> |                                                                                                                                                                                                                                   |

Partnering with Hispanic churches leverages trusted, culturally grounded settings that reach individuals who may not otherwise engage with healthcare systems. Churches provide built-in social support and can involve congregants as CHWs, creating a sustainable, community-driven model. Church-based interventions have largely occurred in non-Hispanic Black congregations, have not targeted SDOH domains, and have often focused on clinical outcomes (e.g., blood pressure, HbA1c) with mixed or null findings; some non-Hispanic Black churches included CHWs, but not in Hispanic congregations.<sup>22,35–38</sup> A systematic review of 21 health initiatives in Hispanic churches revealed that few reported measurable outcomes, and only five demonstrated significant improvements.<sup>18</sup> Impact on clinical outcomes in church settings may be challenging given limited connection

to clinical infrastructure and the need for medication management, titration, and individualized clinical decision-making. In contrast, this study leverages the core strengths of churches—their reach, trust, and sustained engagement within the community—to focus on facilitating linkage to care and access to resources rather than aiming for clinical outcomes.

Training congregants as CHWs was a strategic and sustainable approach. Hispanic churches have a robust volunteer base, minimizing long-term program costs and reflecting existing initiatives. Many churches express interest in supporting whole-person health—mind, body, and spirit—but often lack the structure or expertise to operationalize initiatives.<sup>36</sup> Providing CHW certification, training, and mentoring offers a formal framework that supports these goals and

integrates CHWs into healthcare.<sup>21</sup> This model is inherently scalable: a small initial cohort can be trained (~4 h/week) and equipped to train and mentor additional volunteers, enabling program expansion in churches with minimal external resources. In this program, although five CHWs were trained, only three were needed to operate the intervention, with remaining members creating capacity for ongoing peer training and continuity. This capacity-building is particularly important given the rising prevalence of chronic disease and associated healthcare costs among Hispanic populations.

Future work should test CHW-led interventions in clinical trials to evaluate effectiveness and feasibility in real-world settings. The presence of family members and friends at sessions suggests potential diffusion of intervention content beyond enrolled participants. Scalable dissemination will require integration into church volunteer workflows, tailoring for diverse populations, and addressing barriers to engagement. Partnerships with community organizations and digital health tools may further enhance reach and sustainability.

## Strengths and Limitations

This study's strengths include a novel approach addressing SDOH inequities—specifically healthcare access barriers—through partnerships with Hispanic churches and training congregants as CHWs. While including both participants with and at risk for diabetes could have limited tailoring to group-specific needs, we observed facilitated shared learning and broadened reach. CBPR-informed interventions are increasingly recognized as essential for sustainability,<sup>33</sup> but operationalizing them in real-world settings remains challenging; this study provides a practical model to bridge that gap.

Limitations include self-reported data and lack of a control arm. The study was conducted in a single geographic region with a small sample size, nearly half of whom were Venezuelan. The use of a study-specific, non-validated tool may limit comparability and introduce measurement bias, although it was necessary due to a lack of validated measures of HAQ domain in this population. Additionally, not all CHW-addressed concerns or downstream outcomes (e.g., clinic access, treatment) were captured, potentially underestimating their full impact. Larger studies are needed to confirm these findings and further evaluate the model's impact and scalability.

## CONCLUSION

This study demonstrates the feasibility of shifting a CHW-led intervention from clinic-based to church-based settings. Findings support an underexplored collaboration with Hispanic churches and suggest that this model may effectively reach high-risk individuals who lack healthcare access or are disengaged from the system. This novel approach to identifying and addressing SDOH inequities demonstrates

the potential of community-driven models to meaningfully improve healthcare access.

---

**Corresponding Author:** Elizabeth M. Vaughan, DO, MPH; Department of Internal Medicine, University of Texas Medical Branch, Galveston, TX, USA (e-mail: emvaughan316@gmail.com).

**Author Contribution** EV and LP conceived of the presented idea. EV and CJ developed the theory, performed the computations, and verified the analytical methods. EV, AN, and CJ supervised the findings of this work. EV, SN, CJ, and LP drafted the initial manuscript. All authors (EV, SN, AB, CJ, PRE, MR, AN, GG, LP) discussed the results and contributed to the final manuscript.

**Funding** This work was supported by the National Institutes of Health, National Institute of Diabetes, Digestive, and Kidney Diseases Federal Award, grant number DK129474 (Principal Investigator: Vaughan) and American Rescue Plan Act (ARPA) Public Law 117-2, Section 9901 (Vaughan, site PI).

**Data Availability** The data that support the findings of this study are available from OCHIN upon reasonable request.

## Declarations

**Human Ethics and Consent to Participate** This study was conducted in accordance with ethical standards for research involving human participants and was approved by the institutional review board (IRB). Informed consent was obtained from all participants. Participation was voluntary, and participants could withdraw at any time without consequence. Participant confidentiality was maintained throughout the study.

**Clinical Trial Registration** This study was registered at ClinicalTrials.gov (trial registry #NCT05965869; July 20, 2023).

**Conflict of interest** The authors declare that they do not have a conflict of interest.

**Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

## REFERENCES

1. Levy NK, Park A, Solis D, et al. Social Determinants of Health and Diabetes-Related Distress in Patients With Insulin-Dependent Type 2 Diabetes: Cross-sectional, Mixed Methods Approach. *JMIR Form Res.* 2022;6(10):e40164.
2. Meacham SL, Meisha D, Doerfler SM, et al. Social determinants of health impacting obesity, diabetes mellitus and death due to injury in West Virginia and Virginia coal counties 2015.
3. Office of Disease Prevention and Health Population. Healthy People 2030. 2025; <https://odphp.health.gov/healthypeople>. Accessed 4 Dec 2025.
4. Centers for Disease Control and Prevention, US Department of Health and Human Services. National Diabetes Fact Sheet: National Estimates and General Information on Diabetes and Prediabetes in the United States. Atlanta: CDC; 2020.

5. Center for Medicare & Medicaid Services. Social Drivers of Health and Health-Related Social Needs. 2025; <https://www.cms.gov/priorities/innovation/key-concepts/social-drivers-health-and-health-related-social-needs>. Accessed December 8, 2025.
6. The Joint Commission. New Requirements to Reduce Health Care Disparities. 2022; <https://www.jointcommission.org/standards/prepublication-standards/new-and-revised-requirements-to-reduce-health-care-disparities/>. Accessed 10 Dec 2022.
7. Cartier Y, Fichtenberg F, Gottlieb L. Screening Tools Comparison Tables. 2018; <https://sirenetwork.ucsf.edu/tools-resources/resources/screening-tools-comparison-tables>. Accessed 10 Dec 2025.
8. Henrikson NB, Blasi PR, Dorsey CN, et al. Psychometric and Pragmatic Properties of Social Risk Screening Tools: A Systematic Review. *Am J Prev Med*. Dec 2019;57(6 Suppl 1):S13–s24.
9. Neshan M, Padmanaban V, Tsilimigras DI, Obeng-Gyasi S, Fareed N, Pawlik TM. Screening tools to address social determinants of health in the United States: A systematic review. *J Clin Transl Sci*. 2024;8(1):e60.
10. Moen M, Storr C, German D, Friedmann E, Johantgen M. A Review of Tools to Screen for Social Determinants of Health in the United States: A Practice Brief. *Popul Health Manag*. 2020;23(6):422–429.
11. Porterfield L, Walcher CM, Jones F, et al. Facilitators and barriers to social care in adult primary care: A systematic review using the social-ecological model. *SSM - Health Systems*. 2025/12/01/ 2025;5:100122.
12. Yan AF, Chen Z, Wang Y, et al. Effectiveness of Social Needs Screening and Interventions in Clinical Settings on Utilization, Cost, and Clinical Outcomes: A Systematic Review. *Health Equity*. 2022;6(1):454–475.
13. Kalsi N, Gordon D, Geske J. Identifying and addressing social determinants of health to improve patient-centered care. *J Clin Transl Sci*. 2024;8(1):e73.
14. Kazi S, Starling C, Milicia A, et al. Barriers and facilitators to screen for and address social needs in primary care practices in Maryland: a qualitative study. *Front Health Serv*. 2024;4:1380589.
15. Whitman A, De Lew N, Chappel A, Aysola V, Zuckerman R, Sommers BD. Addressing social determinants of health: Examples of successful evidence-based strategies and current federal efforts. *Off Heal Policy*. 2022;1:1–30.
16. Hays K, Costello J. Churches as agents of community change: An introduction to the issue. *J Prev Interv Commun*. 2023;51(1):1–6.
17. Poobalan A, Whiteley E, Balsubramanya B, et al. Frontline community health care workers' intervention for diabetes management in resource limited settings: A qualitative study on perspectives of key stakeholders. *J Global Health Rep*. 2021;5.
18. Deroose KP, Rodriguez C. A Systematic Review of Church-Based Health Interventions Among Latinos. *J Immigr Minor Health*. 2020;22(4):795–815.
19. Garland DR, Myers DM, Wolfer TA. Social work with religious volunteers: activating and sustaining community involvement. *Soc Work*. 2008;53(3):255–265.
20. American Public Health Association. Community Health Workers. 2025; <https://www.apha.org/apha-communities/member-sections/community-health-workers>. Accessed 10 Dec 2025.
21. Knowles M, Crowley AP, Vasan A, Kangovi S. Community Health Worker Integration with and Effectiveness in Health Care and Public Health in the United States. *Annu Rev Public Health*. 2023;44:363–381.
22. Williams LB, Abu Farsakh B, Karle ER, Almogheer ZS, Coughlin S, Kim Yeary KH. How effective are church-based weight-loss interventions among Black adults? A systematic review. *Obesity (Silver Spring)*. 2024;32(11):2060–2076.
23. World Health Organization. WHO guideline on health policy and system support to optimize community health worker programmes. Geneva, CH: World Health Organization; 2018.
24. Washburn DJ, Callaghan T, Schmit C, Thompson E, Martinez D, Lafleur M. Community health worker roles and their evolving interprofessional relationships in the United States. *J Interprof Care*. 2022;36(4):545–551.
25. Lynch EB, Tangney C, Ruppar T, et al. Heart 2 Heart: Pilot Study of a Church-Based Community Health Worker Intervention for African Americans with Hypertension. *Prev Sci*. 2024;25(Suppl 1):22–33.
26. Florez KR, Payan DD, Palar K, Williams MV, Katic B, Deroose KP. Church-based interventions to address obesity among African Americans and Latinos in the United States: a systematic review. *Nutr Rev*. 2020;78(4):304–322.
27. DePue JD, Rosen RK, Seiden A, et al. Implementation of a Culturally Tailored Diabetes Intervention With Community Health Workers in American Samoa. *Diabetes Educ*. 2013;39(6):761–771.
28. Vaughan EM, Cardenas VJ, Jr., Chan W, et al. Implementation and Evaluation of a mHealth-Based Community Health Worker Feedback Loop for Hispanics with and at Risk for Diabetes. *J Gen Intern Med*. 2024;39(2):229–238.
29. Vaughan EM, Hyman DJ, Naik AD, Samson SL, Razjouyan J, Foreyt JP. A Telehealth-supported, Integrated care with CHWs, and Medication-access (TIME) Program for Diabetes Improves HbA1c: a Randomized Clinical Trial. *J Gen Intern Med*. 2021;36(2):455–463.
30. Vaughan EM, Naik AD, Amspoker AB, et al. Mentored implementation to initiate a diabetes program in an underserved community: a pilot study. *BMJ Open Diabetes Res Care*. 2021;9(1).
31. Vaughan EM, Johnson E, Naik AD, et al. Long-Term Effectiveness of the TIME Intervention to Improve Diabetes Outcomes in Low-Income Settings: a 2-Year Follow-Up. *J Gen Intern Med*. 2022;37(12):3062–3069.
32. Bowen DJ, Kreuter M, Spring B, et al. How we design feasibility studies. *Am J Prev Med*. 2009;36(5):452–457.
33. Wallerstein N, Oetzel JG, Sanchez-Youngman S, et al. Engage for Equity: A Long-Term Study of Community-Based Participatory Research and Community-Engaged Research Practices and Outcomes. *Health Educ Behav*. 2020;47(3):380–390.
34. Texas Department of State Health Services. CHW Certification Requirements. 2026; <https://www.dshs.texas.gov/chw/CertRequire.aspx>. Accessed 29 Jan 2026.
35. Baig AA, Benitez A, Locklin CA, et al. Picture Good Health: A Church-Based Self-Management Intervention Among Latino Adults with Diabetes. *J Gen Intern Med*. 2015;30(10):1481–1490.
36. Campbell MK, Hudson MA, Resnicow K, Blakeney N, Paxton A, Baskin M. Church-based health promotion interventions: evidence and lessons learned. *Annu Rev Public Health*. 2007;28:213–234.
37. Williams LB, Moser DK, Gustafson A, et al. Reaching high-risk Black adults for diabetes prevention programming during a pandemic: The design of Fit & Faithful a randomized controlled community trial. *Contemp Clin Trials*. 2022;123.
38. Alvarado F, Hercules A, Wanigatunga M, et al. Influence of neighborhood-level social determinants of health on a heart-healthy lifestyle among Black church members: A mixed-methods study. *Am Heart J Plus*. 2023;27:100273.

**Publisher's Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.