



A Systematic Review of Church-Based Health Interventions Among Latinos

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Abstract

Latinos face healthcare access barriers and are highly religious. Church-based health interventions could help address these disparities. We conducted a systematic review of church-based health interventions among Latinos using multiple search terms and databases. The 21 articles reviewed represented 19 interventions. Only six were tested through full-scale randomized controlled trials and five had statistically significant improvements in health-related outcomes. Most (16) utilized groups classes, eight promoted screening or preventive services, and three provided these on-site. Few intervened at multiple levels (e.g., individual, group, and community) and only three utilized pastors' sermons to deliver health-related messages. Church-based health interventions among Latinos are nascent, with only a handful of full-scale trials. Various pilot studies demonstrating feasibility across diverse health conditions suggest model adaptability. Larger studies with objectively measured outcomes and interventions that address multiple levels and structural issues are needed to ensure improvements in Latinos' access and health.

Keywords Latinos · Congregations · Health interventions · Systematic review

Introduction

In 2016, the Latino population reached 58 million in the U.S., representing 18% of the population and the largest racial-ethnic minority group [1]. Religious congregations such as churches offer great promise as partners for reaching underserved Latinos and addressing a range of health disparities. Churches are credible, stable entities that have significant reach within underserved communities and a history of social service provision and advocacy related to health and well-being. There are an estimated 300,000 religious congregations in the United States (U.S.) [2], and national surveys have found that about half of all adults attend religious services at least monthly [3]. Churches are often trusted community resources for health information, and play a critical role among Latinos, who, like African Americans, report higher levels of religious affiliation than

other populations [4]. Churches have historically played an important role in the civic and social integration, or assimilation, of recent immigrants [5, 6].

Despite the important role that Latino churches play in their communities, the science of health promotion among Latinos in congregational settings is much less well developed than among African Americans. For example, the earliest reviews of congregation-based health promotion [7, 8] together identified only four articles involving Latino churches, compared to 25 that involved African American churches. Reviews of church-based interventions (i.e., interventions that take place in congregational settings) on specific topics (e.g., physical activity, cancer education, etc.) have also found that most studies have focused on African American churches [9–11]. Such interventions have drawn on various theories, but a key one is the socioecological theory and how congregations can influence members' behaviors at multiple levels of change (individuals, interpersonal, organizational policies and resources, etc.) [8]. Interventions conducted in African American churches can suggest potential interventions, but until interventions are tested with churches that primarily serve Latinos, it is unclear whether these are equally effective among Latino church-going populations.

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Understanding the state of the literature on church-based interventions among Latinos is especially important given the fact that Latinos are often more likely than other racial-ethnic groups to face or experience barriers to healthcare. For example, in a church-based HIV screening intervention that included both African American and predominantly Latino churches, 63% of Latinos tested were uninsured versus 22% of African Americans tested [12]. Historically, Latinos have been more likely to lack health insurance than any other racial-ethnic group [13]. These barriers persist with the Affordable Care Act, since many immigrants are not eligible for coverage and Latinos are less likely to enroll even when eligible [13–15]. Barriers to enrollment and coverage among Latinos include limited English proficiency, not knowing what coverage options are available, and living in a state where Medicaid was not expanded [13, 15]. Such barriers are likely to increase if the recent changes in the public charge definition—which will deny green cards and citizenship to immigrants if they enroll in Medicaid—are implemented [16, 17].

This article reviews interventions that have been tested in congregations with majority Latino populations in the U.S. Our aim is to summarize the types of interventions and populations studied, as well as critique the state of the science (e.g., study designs, evidence of effectiveness) in this particular population and setting. Doing so can help inform future interventions that aim to reach underserved Latinos with health interventions.

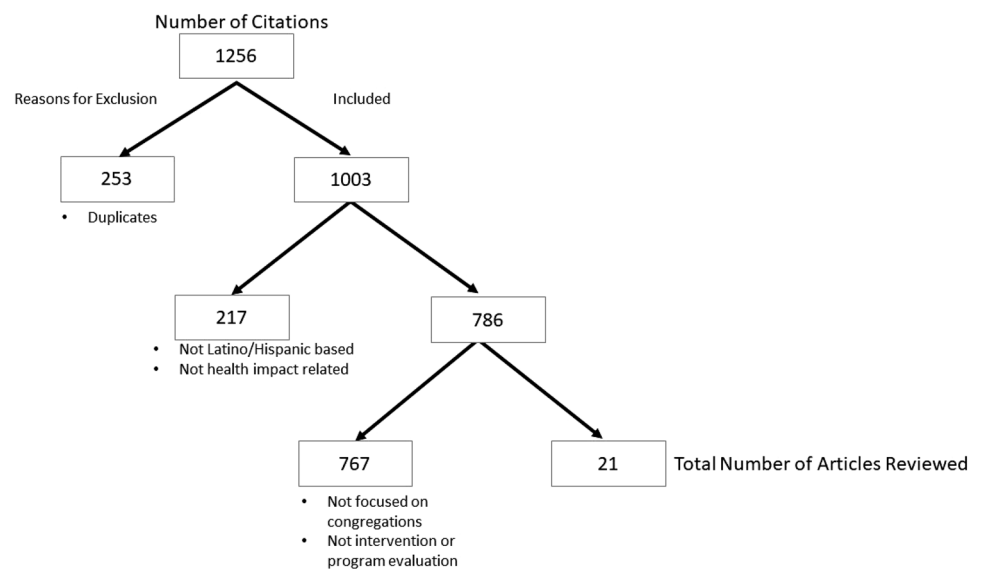
Methods

We conducted a systematic search with the assistance of a research librarian using the following databases: PubMed, CINAHL, PsycInfo, Cochrane, Web of Science, Scopus, and Social and Sociological abstracts. The keywords applied to the search were composed of three intersecting components: Latino participants (“Latina” OR “Latinas” OR “Latino” OR “latinos” OR “Hispanic*” OR “Mexican–American*” OR “Mexican–American*”), faith-based organizations (“church*” OR “religion” OR “religious” OR “spiritual*” OR “faith-based” OR “faith based” OR “community programs” OR “Catholicism”) and a study describing an intervention or program (“randomized control trial” OR “programs” OR “projects” OR “intervention*” OR “evaluation*”). We conducted the search through October 2018. We considered only journal articles and excluded studies in dissertation or thesis format. The total number of articles identified was 1256 of which 253 were duplicates.

The selection process for the articles remaining after removal of duplicates (1003) is shown in Fig. 1. We first reviewed for publications that targeted or included Latino or Hispanic populations in a health-related intervention, including mental health and health education. In the second round of exclusion, we carefully reviewed abstracts and methods sections if necessary to determine if (1) the program or intervention was carried out in a religious congregation and (2) the publication detailed an intervention or controlled study with well described quantitative results.

We focused on studies that implemented health-related interventions in Latino congregational settings—i.e., they did not only use the congregation for recruitment of participants. Once a congregation-based intervention was

Fig. 1 Review process for excluding citations



determined, a further review was made to abstract details about the study and intervention, such as the number of congregations and participants, socio-demographics, study design, target groups, nature of the health intervention, and primary findings. During this detailed review, additional articles were excluded because they: (1) described the same intervention and did not provide any unique outcomes, (2) only used congregations for recruitment, or (3) did not make clear that Latinos or Latino churches were involved in the study. Through these exclusion criteria, the concluding results were 21 articles for review that represented 19 unique interventions [18–35]. Two articles [19, 28] described the same study, but are included because they assessed the effects of two distinct interventions. Two other articles provided additional outcomes or analyses for the same intervention [36, 37] and thus were included in the entries for the primary or first article published [19, 35].

Two reviewers abstracted pertinent details about each study using a standard code sheet developed for this study; any discrepancies were resolved by consensus. Our overall aim was to assess the *science* of Latino church-based interventions (e.g., strength of study designs and evidence for effectiveness) as well as aspects of the *practice* of such interventions (e.g., what types of health issues have been addressed, how have they been addressed, etc.).

Since this systematic review involved only published journal articles and no human subjects, it did not require internal review board approval.

Results

Populations and Geographic Settings

Table 1 provides an overview of characteristics for the 19 unique interventions identified. Nearly all the interventions focused on adults (one pilot study included mothers and daughters) [38]. Twelve focused on Latinos only [18–21, 23, 28, 30–34], while four included Latinos and African Americans [24–26, 29], two focused on Latinos and non-Hispanic whites [22, 35], and one focused on Latinos, African Americans and non-Hispanic whites [27]. Just over half (10) of the interventions were implemented with women only (the other nine with men and women). Most interventions (12) were implemented only in Catholic churches, while five were implemented in both Catholic and Protestant churches, one in a Protestant church, and two did not identify the denomination types. In terms of geographic region: 11 were implemented in the West (eight in California, one in Colorado) or Southwest (Arizona, Texas); four in the Northeast; two in the Midwest; and two in the Southeast (Arkansas and Florida).

Intervention Focus, Modality, and Tailoring

Nearly half of the interventions (eight) focused on cancer screening, most frequently for breast cancer only [23, 27, 28, 30, 35], with one focusing on cervical cancer [31] and two on multiple cancer types (breast, cervical, and/or colorectal) [18, 32]. Another eight interventions focused on obesity-related health conditions and behaviors, including diabetes [20, 29, 33], stroke [22], and physical inactivity [19, 21, 26, 38]. The remaining three focused on other health issues (vaccinations [24], HIV stigma and testing [25], and organ donation [34]).

Intervention modalities and complexity varied. As is common in church-based interventions, group classes (on diabetes, nutrition, physical activity, influenza vaccination, HIV stigma and testing, cancer screening, organ donation) were a common component and used in 16 of the 19 interventions. In seven of these interventions, the groups classes were led by church leaders or members (the latter often trained as *promotoras*); in the other nine, the classes were led by external health professionals. The frequency of classes varied from one-time (vaccinations, breast and cervical cancer screening, organ donation) to six times per week for 2 years (physical activity). Motivational interviewing or counseling delivered via telephone was used in three interventions. Eight of the interventions had a screening test or other preventive healthcare service (e.g., mammography, pap, HIV test, vaccinations) as a primary outcome; in three of these, the screening test or service offered at the church as part of the intervention (Holschneider et al. [31] also provided pap smear screening at the church, but the outcome was knowledge of cervical carcinoma screening). Integration of program health messages into pastors' sermons was also used in three interventions [18, 25, 35]. Few of the interventions would be considered multi-level—i.e., addressed factors at the individual, group, congregational and community levels.

Tailoring interventions for the spiritual/religious characteristics of participants was described for some of the interventions, but the extent varied. Sometimes this meant opening group sessions with prayer or a spiritual reading chosen by participants, while implementing a standard educational curriculum [20, 26, 38]. Only a handful described more extensive tailoring to the religious setting [19, 21, 22, 25].

Study Design and Intervention Effectiveness

Just over half of the interventions (10) were tested using randomization and/or a control group design. Of these, six were tested through full-scale trials [19, 22, 24, 27, 28, 32], including between 10 and 30 churches (a median of 15 or 16 churches). Four other interventions were pilot studies—in most cases involving two churches each [20,

Table 1 Church-based interventions focused on Latinos (n = 19) included in the review

Author (year)	Program focus	Population setting and demographics	Sample N = churches n = participants	Study design	Intervention description	Intervention implementers	Findings
1. Allen et al. (2014)	Breast, cervical, and colorectal cancer screening	Latina adults (Boston, MA) 58% C. American 31% S. American 8% Caribbean 3% Other Mean age 43 years (range 18–79)	N = 1 (Baptist) n = 155	One-group pre-/post-evaluation (pilot) Baseline, 6-month follow-up	6-month intervention: (1) One-to-one outreach (2) Group education and “bingo” games (3) Dissemination of health messages via small media and pastor sermons (4) Behavioral goal-setting (5) Referrals, mobile health vans, and assistance with applications for state-based insurance Theory: Integrative Model of Behavioral Prediction	Church members trained as peer health advisors, assisted by patient navigator	Study focused on feasibility and acceptability Changes in cancer screenings (adherence with breast cancer screening recommendations and in adherence to all recommended screening tests) were not statistically significant

Table 1 (continued)

Author (year)	Program focus	Population setting and demographics	Sample N = churches n = participants	Study design	Intervention description	Intervention implementers	Findings
2. Arredondo et al. (2014)	Physical activity (PA)	Mother–daughter Latina parishioner pairs (San Diego County—Chula Vista) Mothers: 89% Mexican-born or other Latin American country Mean age 37 years Daughters: 11% Mexican-born or other Latin American country Mean age 10 years	N = 1 (Catholic) n = 10 mother-daughter pairs	One-group pre/post evaluation (pilot) Baseline, 8-week follow-up	8-week mother-daughter educational sessions (2.5 h each) covering: (1) Physical activity (2) Parenting and family communication (3) Community resources and modifying home environment (4) Nutrition (5) Photovoice *Sessions began with prayer *Youth activities included interactive games and activities and physical activity sessions Theory: Social Cognitive Theory (SCT) and Family Systems Theory	PI and promotora led mothers' sessions; 2 youth leaders led daughters' sessions	<i>Mothers reported:</i> – Increase in PA hours per week – Decrease in number of hours of TV watching for them and daughters <i>Daughters reported:</i> – Increase in negative attitudes towards TV watching – Increase in parental support for PA (no significance testing because of small sample)

Table 1 (continued)

Author (year)	Program focus	Population setting and demographics	Sample N = churches n = participants	Study design	Intervention description	Intervention implementers	Findings
3. Arredondo et al. (2017) Perez et al. (2018)	Physical activity	Latina adult parishioners (San Diego County) Predominantly Mexican-born women Mean age = 44 years	N = 16 (Catholic), n = 436 [All 16 churches were predominantly Latino] N = 16, n = 319	Cluster RCT (stratified churches by size and randomized) Baseline, 12-month, 24-month follow-up	Fe en Accion (1) Physical activity classes offered at church (6 times per week for 2 years) (2) 30-min motivational interviews (3 interviews in 1st year) (3) Mailed monthly educational handouts (over 2 years) (4) Walkability audits and advocacy *Materials tailored for spiritual and cultural factors Control: Cancer screening attention control condition Theory: Socio-Ecological Framework	Church members trained as promoters	<i>Intervention participants had:</i> – Higher accelerometer-assessed moderate to vigorous PA (MVPA) (diff. in adj. mean = 0.15; effect size = 0.25; P = .03) – More self-reported leisure-time MVPA (diff. in adj. mean = 0.39; effect size = 0.38; P = .003). Intervention participants had significantly: – Lower BMI (diff. in adj. mean = -0.43; P = 0.004) – Increase in behavioral strategies for engaging in physical activity (diff. in adj. mean = 1.08; P < 0.001) <i>Neighborhood esthetics</i> only significant moderator. Intervention group had significantly higher PA at follow-up, only when participants neighborhood esthetics were positive.

Table 1 (continued)

Author (year)	Program focus	Population setting and demographics	Sample N = churches n = participants	Study design	Intervention description	Intervention implementers	Findings
4. Baig et al. (2015)	Diabetes self-management	Mexican-American adults diagnosed with diabetes (Chicago, IL) 95% of participants were of Mexican origin 81% Female Mean age = 54 years	N = 2 (Catholic) n = 100	RCT (pilot) Baseline, 3-month and 6-month follow up	Picture Good Health – 8-week group education classes on diabetes, nutrition and cooking, physical activity, goal setting, motivation and “stimulus control” – Referred participants to church-sponsored exercise programs *Sessions began with prayer and allowed for faith and spirituality discussions Control: One 90-min diabetes lecture Theory: Social Cognitive Theory, Translational Model, Self-Determination Theory	Trained lay leaders affected by diabetes	Primary outcome glycosylated hemoglobin (A1C) : At 3 months, both groups decreased – 0.32% (95% CI [– 0.62, – 0.02]). Change in A1C from baseline to 6 mo. follow-up not significant Difference in change in A1C, LDL, blood pressure and weight from baseline to 3- and 6-months not significant Intervention participants reported fewer days consuming high fats [– 1.34, 95% CI (– 2.22, – 0.46)] and more days participating in exercise session [1.58, 95% CI (0.24, 2.92)]
5. Bopp et al. (2011)	Physical activity	Latino adults (Manhattan, Kansas) 81% of Mexican descent 62% Female Mean age = 42 years	N = 2 (Catholic) n = 47	Cluster RCT (pilot) Baseline, 6-month follow up	Faithful Footsteps Educational information, 8-week <i>walk for life</i> walking contest and health fair *Materials tailored spiritually and culturally Control: received educational units (without physical activity) for 6 weeks Theory: N/A	Church leaders	Intervention participants had greater knowledge and awareness of healthy behaviors as well as physical activity recommendations

Table 1 (continued)

Author (year)	Program focus	Population setting and demographics	Sample N = churches n = participants	Study design	Intervention description	Intervention implementers	Findings
6. Brown et al. (2015)	Reduce stroke risk factors	Hispanic or non-Hispanic white adult parishioners (Corpus Christi, TX) Sociodemographics by treatment/control groups – 62%/66% female – 83%/85% Hispanic/Latino – 27%/14% Non-Hispanic white – Mean age = 53/51 years	N = 10 (Catholic) n = 760	Cluster RCT Baseline, 6- and 12-month follow ups	The Stroke Health and Risk Education (SHARE) Project 1-year multicomponent intervention: (1) Self-help materials (healthy eating guide, physical activity guide with pedometer, motivational short film, photo novela about blood pressure control) (2) < 5 motivational interviewing calls (3) 2 tailored newsletters (4) 2-h workshop to teach pairs to provide autonomy supportive counseling (5) Parish environmental and social changes (availability of low-sodium foods and fruits and vegetables, cooking and physical activity programs) *Materials tailored culturally and spiritually Control: Skin cancer awareness materials or sunblock (at 3 and 9 months) Theory: N/A	Researchers and trained motivational interviewers	Intervention group had a significantly greater fruit and veggie intake (0.25 cups a day [95% CI (0.08, 0.42)] and a significant decrease in sodium intake – 123 mg/day [95% CI (– 195, – 52)] compared to control group No significant difference in self-reported physical activity (– 27 metabolic equivalent-minutes per week [95% CI (– 526, 471), P = 0.56])

Table 1 (continued)

Author (year)	Program focus	Population setting and demographics	Sample N = churches n = participants	Study design	Intervention description	Intervention implementers	Findings
7. Colon-Otero et al. (2014)	Breast cancer	Hispanic (NE, Florida) Most prominent age range was 40–49 years old	N = 6 n = 97	Pre/post questionnaires	(1) Community advertising campaign (media outreach via Hispanic print and radio aimed at healthy eating habits) 1-h church-based seminar on early detection and mammograms, breast self-exam, community resources, and healthy diet Theory: N/A	Radio stations and print media, nutrition faculty, and a bilingual Oncologist	Awareness: Knowledge and intent to perform self-breast exam went from 76% to 97%; willing to make changes in diet went from 25% to 63%. Screening Program Participation: % of Hispanic patients in Duval County that participated increased from 17% to 24%
8. Daniels et al. (2007)	Vaccinations	African American and Latino adults (San Francisco, CA) Overall sample: – 75% female – 44% African-American – 43% Latino – 3% Asian – 8% White Mean age = 65 years	N = 15 n = 186 [Churches had to be > 50% African American or Latino]	Cluster RCT Baseline, 3 to 6-month follow up	1-h educational session on influenza, on-site vaccination Control: Influenza pamphlets and church-based education Theory: N/A	UCSF researchers with medical training	Intervention participants were more likely to receive: – Influenza vaccines [OR 4.8 with the 95% confidence interval of (2.5, 9.4)] – Pneumococcal vaccination [OR 3.6 95% CI (1.8, 7.2)]

Table 1 (continued)

Author (year)	Program focus	Population setting and demographics	Sample N = churches n = participants	Study design	Intervention description	Intervention implementers	Findings
9. Derose et al. (2016)	HIV stigma and mistrust reduction and HIV testing	African American and Latinos adult congregants, (Long Beach and Los Angeles, CA) Overall sample: – 63% Female – 34% African American – 17% US-born Latino – 16% Foreign-born Latino, high English proficiency – 33% Foreign-born, low English proficiency Mean age = 40 years	N = 5 – 1 Catholic (86% Latino) – 2 Pentecostal (100% Latino) – 2 Baptist (94-96% AA) n = 1,235	Cluster RCT (pilot) Baseline, 6-month follow up	Facilitating Awareness to Increase Testing for HIV (FAITH) Church-level intervention: (1) Educational workshops (90 min HIV education workshop, 90 min peer leader workshop) (2) HIV sermon/imagined contact scenario (3) Church-based HIV testing events *Materials tailored spiritually and culturally Control: Waitlist Theory: Contact hypothesis and Socio-ecological Framework	Health department personnel; church members trained as peer leaders; pastor	Congregants at Latino churches had statistically significant reductions in: – HIV stigma (– 0.16, [– 0.25, – 0.06] for Catholic and – 0.38 [– 0.71, – 0.05] for Pentecostal) – HIV mistrust [– 0.15 (– 0.24, – 0.05)] for Catholic and – 0.56 [– 0.86, – 0.27] for Pentecostal Congregants at African American and Latino churches had statistically significant higher rates of HIV testing during follow-up (32% vs. 13% in African American, 38% vs. 7% in Latino, p < .001)

Table 1 (continued)

Author (year)	Program focus	Population setting and demographics	Sample N = churches n = participants	Study design	Intervention description	Intervention implementers	Findings
10. Dornelas et al. (2007)	Physical activity	Hispanic and African American adult women (Hartford, CT) 48% Hispanic (predominantly Puerto Rican) 46% African American 6% Multi-ethnic/other Mean age = 40 years	N = 2 (also one clinic) Baptist (AA), Catholic (Spanish-speaking Latino) n = 76	Comparison between clinic program versus church-based program Baseline, 10-week follow-up	10-week, 20-session exercise program – 2 days per week – 50 min. moderate intensity dance aerobic activity (salsa, samba) *Classes began with motivational/spiritual reading chosen by participants Theory: N/A	Certified fitness instructors	Attendance: Independent of site, older women (age 50–70 years) attended exercise sessions with a mean and standard deviation of (M = 10.45, SD = 4.49) compared to younger women age 17–27 years (M = 4.88, SD = 5.04). <i>Church participants were primarily women > 40 making it impossible to disentangle the relative effect of locale.</i> Fat consumption: inversely correlated with age ($r = -0.30$, $p = 0.012$) and attendance ($r = -0.23$, $p = 0.05$) No effects of either intervention site on weight, waist-hip ratio, blood pressure

Table 1 (continued)

Author (year)	Program focus	Population setting and demographics	Sample N = churches n = participants	Study design	Intervention description	Intervention implementers	Findings
11. Duan et al. (2000)	Mammography screening	African American, Latino, and white adult women age 50+ years (Los Angeles County, CA) Overall socio-demographics by intervention/control: 51%/55% white 33%/24% African American 11%/17% Hispanic 5%/4% other Age range 50–80 years	N = 30 (Catholic and various Protestant) n = 813 [Churches had to be at least 60% African American, Latino, or white] 8 churches were > 60% Latino	Cluster RCT Baseline, 12-month follow-up	Los Angeles Mammography Promotion (LAMPP) Program One session of barrier-specific telephone counseling. Participants were called annually and counseled based on their specific barriers to mammography. *Counseling was tailored spiritually and culturally Theory: Health Belief Model	Church members trained as peer counselors	Peer telephone counseling maintained 7.5% more baseline-adherent participants than did control condition ($p = .029$)—maintenance failure reduced by almost a third
12. Elder et al. (2017)	Cancer Screening	Latina adult parishioners (San Diego County) 91% Mexico-born Mean age = 44 years	N = 16 (Catholic) n = 436 [All 16 churches were predominantly Latino]	Cluster RCT (stratified the churches by size and then randomized) Baseline, 12-month, 24-month follow-up	Fe en Acción Intervention: 6-week series of classes on cancer screening and risk factors, followed by 90–120-min class with selected group on prevention, treatment and risk factors Control: Physical activity intervention [19] Theory: Socio-Ecological Framework	Church members trained as promotoras	Mammogram in past year [OR 4.64 95%CI (2.10.75) $P = 0.0004$] Clinical breast exam in past year [OR 2.81 95% (1.41–5.57) $P = 0.0003$]

Table 1 (continued)

Author (year)	Program focus	Population setting and demographics	Sample N = churches n = participants	Study design	Intervention description	Intervention implementers	Findings
13. Gutierrez et al. (2014)	Diabetes prevention	African American and Latino adults (Harlem and the Bronx) Overall socio-demographics: 88% Female 42% Latino 58% African American 16% 18–44 years old 52% 45–64 years old 25% 65–74 years old 7.5% 75+ years old	N = 15 (Catholic and various Protestant) [7 Black American, 7 Latino, 1 West African] n = 253	Pre-post no control group Baseline, 12-week and 6-month follow ups	Fine, Fit and Fabulous (FFF) 1-h weekly class over 12 weeks on healthy cooking techniques followed by 1-h of physical activity *Materials tailored spiritually Theory: N/A	Nutrition educator, fitness trainers	Statistically significant changes in nutrition knowledge (various self-reported healthy dietary behavior (various) and PA (increase in exercise in the last 30 days) Mean weight loss was 4.38 lbs. ($p < .05$ in paired t test for changes in weight from baseline)
14. Hall et al. (2007)	Breast cancer knowledge and beliefs	Hispanic women (NE Arkansas) Mean age = 36 years	N = N/A Catholic (women recruited through various churches) n = 31	Post-test only control-group design	Educational program derived from Susan G. Komen Breast Cancer Foundation Website, 40-min educational segment delivered in a large-group instruction and later in small group discussions. Participant received a booklet, key chain and practiced self-examination *Materials tailored culturally Control group: Received a 40-min program about nutrition Theory: Health Belief Model	University nursing faculty member	Breast Cancer Knowledge: Mean score for treatment group was 12.92 (SD = 2.40) and 10.53 (SD = 3.41) for control ($p < 0.05$ one tailed) Breast Cancer Beliefs: Out of 5 items, only 2 differences between groups: Benefits of breast self-examination [treatment group 18.57 (SD = 2.1) and control group 19.80 (SD = 0.4)]. Barriers to mammography [treatment control group 33.50 (SD = 10.7)]

Table 1 (continued)

Author (year)	Program focus	Population setting and demographics	Sample N = churches n = participants	Study design	Intervention description	Intervention implementers	Findings
15. Holschneider et al. (1999)	Cervical carcinoma prevention	Hispanic adult women (Los Angeles) 92% from "Central/South America" (likely includes Mexico) 7% US born 92% Spanish-speaking Mean age = 40 years	N = 1 (Catholic) [50% Latino, 35% African-American, 15% White] n = 98	Pre-post no control group (pilot)	Single-visit program that provided a pre-service interview, education class regarding cervical carcinoma and a pap smear screening *Materials tailored culturally Theory: N/A	Dept pathology at USC Women and children hospital	Feasibility: 98% of participants preferred Pap smear screening at the church rather than at a community clinic Knowledge of cervical carcinoma screening: significant improvement in the pre- and post-survey responses
16. Lopez and Castro (2006)	Cancer prevention	Hispanic adult women (Phoenix, Arizona) Socio-demographics by cancer intervention versus family mental health intervention: – 48%/43% 18–39 years old – 52%/57% 40+ years old	N = 14 (Catholic and various Protestant) n = 447	RCT Baseline, 12-month follow up	Compañeros en la Salud Cancer prevention education and cancer screening Control: family mental health education Theory: N/A	Church members trained as promoters	No overall effect of cancer prevention intervention on cancer screening (clinical breast exam, pap, or mammography) Intervention attendance predicted cancer prevention knowledge ($\beta = 0.22, p < .001$)

Table 1 (continued)

Author (year)	Program focus	Population setting and demographics	Sample N = churches n = participants	Study design	Intervention description	Intervention implementers	Findings
17. Marshall et al. (2016)	Diabetes educational program	Latino adult parishioners (North East United States) 51% Female 64% 19–49 years old 34% 50+ years old	N = 2 (Catholic) n = 82	RCT (pilot)	Por Nuestra Salud – Used <i>National Diabetes Education Program Booklet</i> (1) One-on-one training (6 h over 5 weeks) between nurse practitioner and pastor (2) 10 educational seminars for parishioners given by pastor over a 6-week period on diabetes and two health fairs *Material tailored culturally Control: Access to booklet and two health fairs Theory: Community-based Social Marketing Model	Latino Nurse Practitioner (with pastor) and Pastor (with parishioners)	Diabetes Knowledge significant difference in pre-test knowledge between control and intervention groups (intervention mean = 5.33 sd = 1.439 higher than control M = 4.20 sd = 1.305) In posttest, control group had a significantly lower mean (M = 5.92) than intervention group (M = 19.14)
18. Salim et al. (2012)	Organ donation education	Hispanic adults (San Gabriel, CA) 63% Female 93% Hispanic 22% US-born [Participants ages 40–65 years old were more prominent]	N = 4 (Catholic) n = 182	Pre/post surveys	Educational presentation (45 to 60 min) about the need for organ donation, allocation process and religious misconceptions regarding organ donation. Theory: N/A	Local organ procurement organization (OneLegacy)	Significant increase in factual organ donation knowledge (pre: 54% post: 70%, $p < 0.0001$), perceptions regarding organ donation (pre: 43%, post: 58%, $p < 0.0001$), and organ donation beliefs (pre: 50%, post: 60%, $p = 0.0001$), though there were no significant changes to intent-to-donate

Table 1 (continued)

Author (year)	Program focus	Population setting and demographics	Sample N = churches n = participants	Study design	Intervention description	Intervention implementers	Findings
19. Welsh et al. (2005) Sausaia et al. (2007)	Breast cancer screening education	Latina adults (Colorado) 22% Latina 57% White 4% Black 16% Other Age range = 50–64 years	N = 213 (Catholic) n = 6696	Quasi-experimental. Compared two interventions: printed materials only (206 churches) and print + promotoras (4 churches) Baseline-1 year follow up	The Tepeyac Project Printed intervention only (209 churches): received a display of bilingual printed materials about promoting breast cancer screening, delivery of bilingual short messages from pulpit, information about the project in church bulletin Promotora intervention plus print intervention (4 churches): received a promotora-led (bi-monthly) meetings, homilies addressing breast health and information on a newsletter Theory: N/A	Clinica Tepeyac staff	Mammography: Rates for Latinas and non-Latina whites with Medicaid increased though not significant. With GEE, the promotora intervention had a marginally greater effect than the printed statewide intervention in increasing Latinas' mammography use (GEE, $P = .07$) Biennial mammography screening: Women from 5 major health plans living in zip codes of churches that implemented Promotora intervention had significantly higher increase in biennial mammograms than did women living in zip codes of churches that received only the print intervention [– GEE parameter estimate = .24 ($\pm .11$), $p = .03$] (independent of age, income, urban, and insurance)

Bolding is used to highlight outcomes examined

26, 33], but one study had five churches [25]—and used a randomized or non-randomized design with a control group. The other eight interventions were tested through pre-post designs without control groups or post-test only with control group and had a wide range of numbers of churches—from one [18, 31, 38] to 206 [37] (others had two [21], four [34], and 15 [29] churches). One intervention recruited women from various churches and the community in general and held the intervention at a single Catholic church [30].

Of the six interventions tested in full-scale trials, all but one had statistically significant improvements in the primary outcomes, including accelerometer-assessed moderate to vigorous physical activity (MVPA) and self-reported leisure-time MVPA activity [19], self-reported fruit and vegetable intake and sodium intake [22], receipt of influenza and pneumococcal vaccination [24], and receipt of screening mammography [27, 28]. The one full-scale trial that did not have significant intervention effects was one that used promotoras to conduct cancer prevention education (no effect on receipt of pap test, mammography, or clinical breast exam) [32]. However, this study did find that intervention attendance predicted cancer prevention knowledge. Another study, which did not meet the RCT criteria but is notable because of the number of churches involved, implemented a state-wide intervention in which printed educational materials were sent to all 213 Catholic churches and, in four churches in Denver, clinic-based promotoras (peer counselors) also provided outreach and conducted small group meetings around breast health [35, 37]. Another notable aspect of this study was that the evaluation was done not at church level but at the community level, using administrative data from Medicaid, Medicare, and the five major insurance plans in the state. The promotora intervention appeared to have a small increase in biennial mammograms as compared to the print intervention alone [37].

Among the other studies that did not fall in the full-scale RCT category, results were more varied. For example, among the four pilot cluster RCTs, objective measures such as hemoglobin A1C, LDL, blood pressure, and weight were no different in intervention church participants versus controls; however, there were statistically significant improvements in self-reported measures such as fat consumption and physical activity [20], diabetes knowledge [33], awareness of and knowledge about healthy behaviors and physical activity recommendations [21], and HIV-related stigma, mistrust, and testing [25]. Among the studies that used only pre- and post-measures (no control group), there were promising results from the larger of these in promoting meaningful improvements in health (for example, weight loss, nutritional knowledge, dietary behavior, and physical activity) [29]. Nevertheless, most of the pilot pre- and post-designed studies focused on feasibility and acceptability and found

few statistically significant effects on outcomes (of those that were, all were knowledge-based) [18, 23, 31, 34].

Discussion

Partnerships between faith-based communities and public health entities could be effective ways to reach underserved Latinos with critical health interventions, particularly since Latinos are highly religious and face some of the largest healthcare access barriers. However, as evidenced in this review, the science and practice of church-based health promotion is much less well-developed among Latino populations as compared to African Americans. Here we identify the principal findings from our review and areas for research going forward.

In terms of the science of church-based interventions among Latinos, it was apparent that the field is still in its early stages. With only six full scale RCTs and this across several different health issues (cancer screening, physical activity, and stroke risk reduction), more work is needed to determine effectiveness of these approaches. As a point of comparison, just in the area of obesity prevention, there have been at least 14 full-scale church-based efficacy trials (12 with African American churches [39–51] and one each with White [52] and Latino [19] churches). The diverse topics addressed through church-based pilot studies among Latinos—cancer screening, obesity-related health issues, HIV stigma reduction and testing, and organ donation—demonstrate the adaptability of church-based approaches across a range of health topics. And many of these pilot studies demonstrated statistically significant changes in knowledge and attitudes and self-reported behaviors. However, whether such changes in knowledge, attitudes, and self-reported behaviors result in objectively-measured health improvements (e.g., improved weight, blood pressure in the normal range, etc.) is important to determine. Larger studies that are fully powered to detect meaningful differences in biometric and other objectively measured outcomes would strengthen the foundation and understanding of what can be achieved among Latinos through church-based interventions.

In terms of the practice of congregational interventions with Latinos, our review revealed several important trends. First, over half (12) of the interventions focused only on majority Latino churches, but that meant that the other seven included churches and individuals of other races and ethnicities, most notably African Americans (5 interventions). These trends likely reflect the demographic shifts affecting many urban areas in the U.S. but also raises questions about the extent to which cultural tailoring for church-based interventions is needed when working across racial-ethnic groups. Diverse denominations and faith traditions are also likely relevant in terms of tailoring.

Churches that Latinos attend may serve a more diverse congregation than Black churches traditionally have, and this raises additional issues around tailoring. Nationally, 55% of Latinos are affiliated with the Catholic Church, while 16% are evangelical, 5% Mainline Protestant, and 18% are unaffiliated [53]. Thus, it is not surprising that most of the studies targeted Catholic churches, particularly given their hierarchical polity and strong inter-connected network, which likely facilitated recruitment and can facilitate scale-up of effective interventions. However, the proportion of the Latino population affiliated with the Catholic Church has been declining over the past few decades as more switch to non-Catholic denominations (primarily evangelical and Pentecostal) and non-affiliated. Thus, determining how to engage with diverse denominations will become more important in reaching Latino populations through faith-based organizations going forward.

Another trend in terms of practice was that most interventions were conducted in the West, Southwest, and Northeast, regions that traditionally have higher Latino concentrations. However, the past two decades have seen an unprecedented geographic dispersion of the U.S. Latino population, away from traditional destinations to new destinations, particularly in the Upper Midwest and the South [54, 55]. Our review found only four small pilot studies in these newer geographic areas. This is of concern because Latino immigrants in these areas tend to experience worse access [56, 57]. It is thus important to strengthen the health and safety net infrastructure in these destinations, which are likely to be in states with more restrictive Medicaid policies and fewer interpreters and language-concordant providers [58]. Churches that serve Latinos in such areas could play important roles in facilitating outreach, trust, and access to quality services. Moreover, finding ways to link healthcare systems with churches that serve Latinos is a promising strategy, such as healthcare system-employed promotoras and parish nurses that spend time in congregational settings providing preventive services and referrals to care.

A third trend related to the demographic groups involved in these church-based interventions among Latinos. Just over half (10) of the interventions focused on women or girls and just under half included both men and women. Notably, only one of the studies included children (and this was a small feasibility pilot) [38], yet churches offer a unique opportunity to intervene with families and even sometimes across multiple generations (e.g., grandparents, children, grandchildren). Further, it should be noted that Latinos are not a monolithic group but rather have many differences in terms of country of origin, language, years in the U.S., rural versus urban, etc., all of which need to be considered in designing Latino church-based interventions. Although information on age and acculturation was limited in the studies reviewed, it does appear that most Latinos included

in church-based studies have been immigrants and over the age of 40. However, immigrants also face some of the largest healthcare access barriers [58] and the risk of chronic diseases increases with age. Thus, church-based interventions that reach Latinos can have an important impact on population health.

A fourth trend related to intervention modalities. Group activities were common, which is not surprising, since most churches routinely hold groups meetings (e.g., Bible study, prayer)—and can offer social support to promote health behavior change [59, 60]. However, only three interventions leveraged pastors' sermons to deliver or complement intervention content, which seems like a lost opportunity given the moral authority of pastors and pervasiveness of this activity in congregations. Further, sermons are a concrete way to engage pastors, priests and other religious leaders in the intervention and allow for tailoring to culture and faith tradition. Additional work is needed to understand how sermons may be leveraged to promote health across diverse health topics and congregations [61].

Sermons are also an opportunity to make interventions church-level—i.e., ones that reach the entire congregation and not just those who participate in the group activities. Socio-ecological theory posits that health is influenced by multiple levels (intrapersonal, interpersonal, organizational, physical and social environment, and policy) [62]. However, few Latino church-based interventions have taken this multi-level approach and few church-based interventions in general have explicitly addressed the broader community environment [39, 40]. This means that in addition to providing classes or programs for church members, interventionists should consider way to incorporate activities through social networks, congregational meetings, and congregational policies. Further, identifying ways that congregations can advocate to improve community conditions are key. Broader approaches are likely necessary to address the social determinants of health and thereby have a stronger and more sustainable impact on population health.

In terms of topics addressed through church-based interventions among Latinos, cancer screening and obesity-related health conditions comprised the overwhelming majority. Three interventions addressed diabetes—one focused on diabetes self-management and two on diabetes prevention. More work on this topic is needed, given that Latinos are affected by diabetes in similar proportions to African Americans and there have been dozens of church-based interventions focused on African Americans [46, 63, 64]. There are numerous other health issues that disproportionately affect Latinos, such as HIV. Moreover, few of the studies reviewed explicitly addressed issues related to access to the healthcare system, which is of heightened importance for Latinos given that they have the highest rates of uninsurance among all racial-ethnic groups. In one study that

did provide on-site testing (for HIV), 63% of Latinos who participated in the testing were uninsured (compared to 23% of African Americans who tested), while the percent uninsured among Latinos generally in this community was 34% [12]. Church-based screening services—in this case, for HIV testing—appear to be filling an unmet need for uninsured Latino congregants.

In the absence of comprehensive immigration and health policy reforms that would remove several of the barriers that Latinos face to obtaining such services, structural interventions that directly address the disparate access to resources faced by immigrants should become more the norm rather than the exception. Further, future church-based studies may consider including measures related to experiences of stigma and discrimination—this could be increasingly important given heightened immigration enforcement, which has been found to be associated with reduced utilization of prenatal care [65] and poor health and mental health [66, 67] among Latinos.

Limitations

As with most systematic searches, it is possible that we missed some articles. To minimize this possibility, we enlisted the support of a library science expert, used broad search terms, and reviewed many articles in their entirety (rather than only abstract review). In addition, given the tendency toward publication bias (where studies with statistically significant findings are more likely to be published) [68–70], we may have overestimated the evidence that church-based interventions among Latinos are effective in improving certain health behaviors (physical activity, mammography, vaccinations, and dietary behavior). However, since there were so few full-scale effectiveness trials in any given health topic, we have been very cautious in our conclusions.

Conclusion

Latinos and especially Latino immigrants continue to face tremendous health access barriers in the U.S. and partnerships with faith-based organizations could help address some of these. However, the science of church-based health interventions among Latinos is much less well developed than among African Americans. Future work should include fully-powered studies with objectively measured health outcomes and a focus on new geographic destinations. Further, incorporation of multiple levels and structural issues (e.g., facilitating access to care) are likely necessary to produce long-lasting health improvements in this population.

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Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

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