

Implementation Evaluation of a Parks- and Faith-Based Multilevel Intervention to Promote Physical Activity Among Latinos

Lilian G. Perez,¹ Tara Blagg,² Alane Celeste-Villalvir,³ Gabriela Castro,¹ Michael A. Mata,⁴ Sergio Perez,⁵ Elva Arredondo,⁶ Steven Loy,⁷ Anne Larson,⁸ and Kathryn P. Derose^{1,9}

¹RAND Corporation, Santa Monica, CA, USA; ²Pardee RAND Graduate School, Santa Monica, CA, USA; ³The Praxis Project, San Francisco, CA, USA; ⁴Nazarene Theological Seminary, Kansas City, MO, USA; ⁵Archdiocese of Los Angeles, San Gabriel Pastoral Region, Irwindale, CA, USA; ⁶Department of Psychology, San Diego State University, San Diego, CA, USA; ⁷Department of Kinesiology, California State University, Northridge, CA, USA; ⁸School of Kinesiology, California State University, Los Angeles, CA, USA; ⁹Department of Health Promotion and Policy, University of Massachusetts Amherst, Amherst, MA, USA

Background: Latinos in the United States face multiple barriers to engaging in physical activity (PA). We implemented a faith-based multilevel intervention to promote PA in parks for Latino adults, which was partially adapted to a virtual platform during the COVID-19 pandemic, and evaluated it using the Reach, Effectiveness, Adoption, Implementation, and Maintenance framework. **Methods:** We conducted in-depth semistructured interviews (83% in Spanish) with 24 intervention participants (75% women) participating in a cluster randomized controlled trial in 2019–2022 that linked 6 churches (3 intervention, 3 control) with parks in East Los Angeles, CA. The intervention included in-person, park-based fitness classes, which were adapted to Facebook during the pandemic; PA motivational text messages; and other activities. Interviews assessed Reach (participation), Effectiveness (perceived impacts), Implementation (participation barriers/facilitators), and Maintenance (plans for sustaining PA), as well as perceived pandemic impacts. **Results:** About 80% of interviewees participated in ≥1 park class and 67% in ≥1 virtual class (Reach). Interviewees perceived positive intervention impacts across multiple health and well-being domains (Effectiveness) despite perceived negative pandemic impacts; several facilitators to participation (personal, social, program) and few barriers (personal, virtual, environmental; Implementation); and plans for maintaining PA (eg, revisiting intervention text messages and video recordings; Maintenance). **Conclusions:** Findings support the utility of Reach, Effectiveness, Adoption, Implementation, and Maintenance to understand the broad impacts of a faith-based PA intervention. Findings point to the adaptability and robustness of the intervention during a public health crisis. Overall, findings may help inform the translation of the intervention to other communities to advance health equity.

Keywords: exercise, hispanics, health promotion, health equity, implementation science, RE-AIM

Key Points


- A faith-based intervention, adapted to a virtual platform during a public health emergency, reached and supported physical activity, health, and the well-being of an underserved Latino community.
- Participants identified multilevel drivers of exercise class participation, multilevel perceived impacts, and key intervention components that could support physical activity maintenance.
- Findings point to the utility of implementation evaluations to inform the future translation and sustainability of faith-based interventions to promote health equity.

The health benefits of physical activity (PA) are well known,^{1–4} yet many communities experience unequal opportunities to engage in PA. In the United States, Latinos have the highest prevalence of physical inactivity (32.1%) compared to other racial and ethnic groups.^{5,6} Consequently, Latinos have some of the highest rates of obesity and chronic conditions.^{7,8} Although a growing number of interventions, many based in community settings such as churches, have been shown to increase PA among Latinos,^{9–12} such interventions are rarely sustained or scaled up to have broader impacts beyond the research context.¹³

The drivers of Latinos' low PA include factors at multiple levels,¹⁴ and interventions are increasingly targeting multilevel PA determinants, that is, facilitators and barriers, in line with the socioecological framework.^{15,16} For example, multilevel PA interventions with the Latino community have targeted individual (eg, self-efficacy) and social (eg, social support) factors, and a few have addressed environmental (eg, access to exercise facilities) and organizational (eg, leadership support) factors.^{14,17} In particular, several studies have engaged faith-based organizations in designing and implementing multilevel PA interventions^{10,18,19} because they have wide reach in Latino communities and are a trusted source of health information.^{20,21} However, multilevel PA interventions are complex and often warrant additional resources that many churches may not have, including PA amenities.²² Further, some faith leaders may lack the knowledge and support to address PA in their congregation despite their interest to be

Celeste-Villalvir  <https://orcid.org/0000-0002-7736-9557>

Arredondo  <https://orcid.org/0000-0002-9715-692X>

Perez (lperez@rand.org) is corresponding author,  <https://orcid.org/0000-0003-3823-7380>

involved.²³ Such challenges can affect who engages in these interventions, their implementation and impacts, and the extent to which they can be sustained or scaled up. Evaluations of faith-based multilevel PA interventions in Latino communities have largely focused on effectiveness, specifically individual PA,^{14,24–26} while understanding of implementation and their broader impacts such as reach are less understood. The field of implementation science can help fill these gaps.

Implementation science is defined as the study of methods to promote the integration of research and evidence into practice and policies.²⁷ Specifically, the framework called Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) can guide the evaluation of multilevel PA interventions with a health equity focus.^{28–30} RE-AIM can help understand a program's robustness, translatability, and public health impact.³⁰ For example, an evaluation of the Be Fit Be Well intervention suggested the intervention's success could be explained by several factors across RE-AIM domains, including implementation and maintenance: use of community health workers providing ongoing support.²⁹ Thus, RE-AIM can help explain intervention impacts that cannot be understood by studying changes in PA alone.

RE-AIM can also capture dynamic, contextual changes and intervention adaptations.³¹ In 2020, the COVID-19 pandemic required that many interventions pivot to virtual platforms, which may have influenced which participants remained engaged, potentially due to technological challenges,³² and intervention impacts. The pandemic may have also worsened or created new barriers to engaging in PA, such as restricted access to PA open spaces and economic challenges.³³ It is unclear how Latino communities navigated such challenges during the pandemic or how a faith-based PA intervention may have helped address such challenges to help them stay physically active.

This study applies the RE-AIM framework^{30,34} to evaluate a multilevel intervention linking churches with local parks to promote PA, specifically from the perspective of churchgoing Latino participants.³⁵ The present study examines the following questions: (1) Who engaged in intervention activities and why (reach), (2) What were the perceived impacts of the intervention (effectiveness), (3) What multilevel barriers and facilitators impacted participation (implementation), and (4) How did participants plan to stay active postintervention (maintenance)? Given the evaluation focused on participant perspectives, we did not assess Adoption, such as which churches participated, as this can be captured in future process evaluations using administrative data.

Methods

Study Design

As part of a supplemental study to an ongoing intervention trial, we conducted in-depth semistructured interviews to assess participant perspectives of Reach, Effectiveness, Implementation, and Maintenance following participation in a faith- and park-based multilevel PA intervention in East Los Angeles, CA, and surrounding areas, titled *Parroquias y Parques/Parishes and Parks*.³⁵ The intervention is an ongoing cluster randomized controlled trial implemented in 2 cohorts. Intervention participants are offered a program led by lay peer leaders and kinesiology students, targeting multilevel determinants of PA: individual, group, church, and neighborhood park. Participants in the control churches only receive publicly available information about PA such as handouts.

A Community Advisory Board, including community, park, and government representatives, guide all aspects of the research.

The present study focuses on the first cohort of 6 Catholic churches, specifically a sample of participants from the 3 intervention churches (n = 24). Intervention activities for the second cohort of churches are ongoing. The supplemental study obtained Institutional Review Board approval, and participants provided verbal informed consent for the interviews; they provided written informed consent for the main intervention.

Intervention

Parishes and Parks targets factors across multiple levels:³⁵ individual text messages; peer leader support and walking groups; church strategies including PA-focused sermons/homilies, church announcements and support for the intervention, and church-sponsored events in the parks; and strategies at the neighborhood park including park-based group exercise classes, park environmental advocacy, and participation in the local park advisory board. With the help of church priests, the intervention recruited lay leaders from the intervention churches (15–25 per church) to serve as “peer leaders,” who were tasked with motivating other parishioners to engage in intervention activities, leading walking groups, and participating in trainings. Prepandemic, group exercise classes took place in the park closest to each intervention church, that is, 1 km or less or about a 10-minute walk, and were led by trained kinesiology students, including some who were bilingual or from Latino backgrounds, which was intended to build trust and effective communication with participants.³⁶ Classes were based on the 3 WINS Fitness program, a free exercise program delivered by kinesiology students in underserved communities.³⁷ Classes focused on cardiovascular fitness and strength building exercises were each 1 hour long, and, held 3 to 4 times a week.

Intervention activities for cohort 1 were initiated in each church in the fall of 2019, after completion of baseline data collection. In March 2020, most intervention activities were paused due to the COVID-19 pandemic restrictions for in-person gatherings. The daily PA motivational text messages continued and were adapted to provide more pandemic-related support such as how to stay safe.³² Peer Leaders also continued to meet each month virtually. Other components, including environmental activities and PA-related church sermons, were paused indefinitely due to challenges in adapting to virtual delivery with this population. All study churches stopped having in-person services, and Cal State LA interns were remote until fall of 2021. When it was clear that the pause in in-person activities was going to be extended indefinitely, we explored the feasibility and acceptability of a virtual class option offered through Facebook Live and then implemented this starting in the fall of 2020. Virtual fitness classes were offered at the same frequency and length as the in-person classes, were led by kinesiology students, and offered aerobic and strength building activities. The intervention Facebook page was publicly available, so participants did not need to create an account. Videos were recorded live and saved on the Facebook page. Text messages notified participants about the class schedule, and the project coordinator offered technological assistance. In-person classes resumed in the summer of 2021 and continued through the fall of 2022. Due to pandemic disruptions, the intervention period covered approximately 2 years and several of church and environmental activities were not carried out consistently or at all for this cohort. Text messages, including motivational and intervention activity reminders, continued throughout these 2 years, with

slightly reduced frequency in the second year, to 3 times per week rather than daily. The present evaluation focuses on participants' perceived impacts of the text messages and in-person and virtual classes.

Sampling

Details about the church and participant recruitment for the main intervention trial can be found in a published protocol paper.³⁵ In brief, the Archdiocese of Los Angeles was a key partner in this study and provided a list of parishes to identify those that met inclusion criteria: located in a zip code with over 80% Latino residents, was within 5 miles of our partner institutions where student instructors for the exercise classes attended, and had a park within 1 km where classes could take place. The principal investigator and project manager met with the dean of the deanery that the parishes belonged to and presented at the deanery meeting to meet the priest and obtain updated information about the parishes. The final list of eligible parish-park pairs was discussed with the Community Advisory Board to select those to be invited. The head priests of eligible churches received an official invitation letter, signed by the principal investigator and the Catholic Bishop overseeing the parishes, and met with the principal investigator and project manager, where they confirmed their interest to participate. Parish sizes ranged from 350 to 2000 adults attending mass on the weekends.

For the present qualitative study, we randomly selected 30 participants to participate in an in-depth semistructured interview. We aimed to hear perspectives from everyone, including those who may have faced more barriers to participate at all. A recruitment letter was sent to participants and a bilingual (Spanish/English) team member called them, with up to 2 additional contact attempts per individual, to inquire about their interest to participate. A total of 24 participants (8 per church) agreed to participate. A review of the notes and transcripts for the 24 interviews revealed we had reached thematic saturation; thus, we stopped recruitment. Interviewees received a \$50 gift card for participating.

Data Collection

In-depth semistructured interviews were conducted from November 2022 through January 2023 by 2 bilingual (Spanish/English) team members (Perez and Blagg) with qualitative research experience. Interviews were conducted over the phone in the participant's preferred language and ranged from 15 to 45 minutes; those who did not participate in any classes had shorter interviews. Interviews were audio-recorded, professionally transcribed verbatim in the interview language, and reviewed by Perez for accuracy. Notes were taken during the interview and used to supplement the transcripts, as needed.

The interview protocol (sample questions in Table 1; full protocol in Appendix 1) assessed perspectives across reach, focusing on class participation and reasons for attending; effectiveness, specifically perceived impacts across personal, social, program, organizational, and environmental levels; implementation, including multilevel barriers/facilitators to class participation; and maintenance, focusing on plans for staying active postintervention. We also inquired about COVID-19 impacts, such as changes to employment, and recommendations for future PA interventions, for example, park/virtual or hybrid.

Further, all participants completed a baseline health survey for the overall intervention trial. We examined sociodemographic data, including gender, age, nativity, education, employment status, and marital status.

Data Analysis

We uploaded transcripts to Dedoose³⁸ for coding. The lead author (Perez) developed an initial codebook based on inductive and deductive reasoning³⁹ and interview protocol, as well as conducted a preliminary review of the transcripts. Two bilingual researchers (Perez and Celeste-Villalvir) independently coded the same 6 transcripts and met to reconcile differences in coded content and interpretations, modifying the codebook as needed, including

Table 1 Sample Interview Questions Across 6 Key Topics With Sample of Latino Participants From Cohort 1 of Parishes and Parks

Topic	Sample question
Reach	<ul style="list-style-type: none"> • In 2019, Parishes and Parks was offering your church some exercise classes at the nearby park [PARK NAME] 2–3 times a week in the evenings and sometimes on the weekends. Do you remember attending any of those classes? [Can you tell me a little bit about that experience?] • When the pandemic started, we could no longer offer the classes in the parks, so Parishes and Parks designed a new exercise program on Facebook live, these classes started in October of 2020 and were offered 4 times a week, mostly on evenings and Saturday mornings. Did you ever attend one of those classes on Facebook? [Can you tell me a little bit about that experience?] • In addition to the classes, Parishes and Parks sent you some text messages about the importance of physical activity, do you remember receiving those messages? [Did you find them motivating? Is there an example of a message that you found particularly motivating?]
Effectiveness	<ul style="list-style-type: none"> • You mentioned attending the [PARK and/or ONLINE] classes offered by Parishes and Parks, how do you think the program has impacted you? • How do you think the text messages affected you?
Implementation	<ul style="list-style-type: none"> • What motivated you to participate in those classes? • What made it difficult for you to attend the classes in the park/on Facebook?
Maintenance	<ul style="list-style-type: none"> • After the Parishes and Parks program ends, what do you plan to do for exercise? [What would help support you to do that? What would make it difficult for you to do that?]
COVID-19	<ul style="list-style-type: none"> • Think about the beginning of the pandemic, how did this crisis affect your ability to engage in physical activity?
Recommendations for Future Physical Activity Programs	<ul style="list-style-type: none"> • Finally, I want to ask about your thoughts on how to develop an exercise program for other churches in the future. Would you recommend promoting physical activity classes in parks only, social media only, or both? [Why do you recommend this approach?]

labels, definitions, and merging codes. The final codebook contained 8 codes and 63 subcodes as well as definitions and examples. The coders then independently coded a different subset of 6 transcripts, that is, 25% of overall sample, to estimate interrater reliability. Interrater reliability calculation was performed using existing SAS code.⁴⁰ Cohen kappa score for the 6 transcripts was .76, representing good interrater reliability. Perez and Celeste-Villalvir then separately coded the remaining transcripts using the finalized codebook and checked in regularly to discuss questions or issues that arose. Once all transcripts were coded, the excerpts were exported to Excel. Perez reviewed the excerpts to identify themes and subthemes, assess the range and frequency of themes, and identify additional themes that emerged. Themes were presented to the research team and Community Advisory Board for feedback. We computed frequencies and mean statistics for the sociodemographic variables and compared the interview sample data to the overall main study sample ($n = 507$) using one sample test of proportions for binary variables and single-sample t tests for continuous variables in SAS (version 9.4).

Results

Interviewees were similar in sociodemographics compared with the overall main study sample ($P > .05$; data not shown). Specifically, they were predominantly female, middle-to-older aged, Spanish-speaking, born outside the United States, and of low socioeconomic status (Table 2). Themes are organized by 4 RE-AIM domains as well as the 2 additional topics on pandemic impacts and recommendations for future PA interventions (Table 3). Exemplary quotes translated to English are provided to illustrate themes.

Reach

Interviewees reported higher participation in the park-based classes (80%) than virtual classes (67%; Table 3). Although we did not ask about the walking groups, given they were just starting when the pandemic started and needed to be suspended indefinitely, a few interviewees mentioned participating. Reach was also high for intervention text messages (79%); other interviewees either did not

remember or did not receive them. Interviewees also expressed engaging in alternative activities when they could not attend classes, with walking being the most common exercise.

Among those who attended intervention classes, interviewees revealed overall positive experiences. For the park-based classes, positive elements included the social aspect of group classes, benefits to one's health, and opportunity to learn new ways of exercising. For the virtual classes, positive elements included the convenience of exercising at home and on one's own time with the recordings; increased motivation to exercise; exercises were fun; and feeling connected to others online in the Live classes. However, a few interviewees noted they still preferred in-person classes because online videos were harder to concentrate on, and lacked the social aspect, and exposure to fresh air that one would get from being a park.

Effectiveness

Interviewees perceived positive intervention impacts across multiple levels: personal, social, environmental, virtual, and other (Table 3). The most common perceived impact was on personal health, including helping to develop a healthier lifestyle; physical health benefits for weight loss, pain reduction, chronic disease management; and mental health benefits such as reduced depressive symptoms. Most interviewees noted the text messages enhanced motivation to exercise. The second most common perceived impact was on social health, including helping to build connections with fellow parishioners.

Less commonly perceived impacts were in the environmental and virtual domains. A few interviewees reported the classes helped them feel safer and more comfortable visiting the intervention park. A few reported improved confidence to use technology and virtual programs. Further, a few noted the classes benefited multiple generations, including older participants and children of participants who joined the classes.

Implementation

Interviewees cited personal, social, and program factors as top facilitators to participating in intervention classes (Table 3). The

Table 2 Sociodemographic Characteristics of Latino Interviewees From Cohort 1 of Parishes and Parks, East Los Angeles, California

	Total (N = 24)	Church 1 (n = 8)	Church 2 (n = 8)	Church 3 (n = 8)
Female, n (%)	18 (75%)	6 (75%)	6 (75%)	6 (75%)
Age, mean (SD)	55.4 (11.6)	52.6 (14.9)	57.3 (8.2)	56.4 (11.7)
Spanish interview, n (%)	20 (83.3%)	7 (87.5%)	6 (75%)	7 (87.5%)
Foreign-born persons, n (%)	20 (83.3%)	7 (87.5%)	6 (75%)	7 (87.5%)
Education, n (%) ^a				
Less than high school	16 (66.7%)	5 (62.5%)	4 (50%)	7 (87.5%)
High school graduate/GED or higher	8 (33.3%)	3 (37.5%)	4 (50%)	1 (12.5%)
Employment, n (%) ^a				
Part/full-time/self-employed	8 (33.3%)	3 (37.5%)	1 (12.5%)	4 (50%)
Unemployed/homemaker/retired/disabled	16 (66.7%)	5 (62.5%)	7 (87.5%)	4 (50%)
Marital status, n (%) ^a				
Married/living with partner	17 (70.8%)	5 (62.5%)	7 (87.5%)	5 (62.5%)
Not married/divorced/separated/widowed	7 (29.2%)	3 (37.5%)	1 (12.5%)	3 (37.5%)

^aVariables were dichotomized based on distribution of the data. Abbreviations: GED, general educational development.

Table 3 Summary of Main Qualitative Findings Across Themes and Exemplary Quotes From Cohort 1 of Parishes and Parks, East Los Angeles, California

Theme	Main findings	Exemplary quotes
Reach	<ul style="list-style-type: none"> • Higher participation in the park-based vs virtual classes. Attended both types of classes (n = 14); only the park-based classes (n = 5); only the virtual classes (n = 2); neither type of class (n = 3); A few (n = 5) mentioned attending the intervention walking groups. • High reach for the intervention text messages (n = 19). • When not in class, participants engaged in alternative activities (n = 15). Walking, personal home equipment, exercising at a park on own, other group class (eg, Zumba), videos on YouTube, playing with kids. • Overall positive experiences with both types of classes, but preferences for in-person classes, as a motivator for participation. 	<p>“Only a couple of them [virtual classes] because we would have had [internet] connections . . . It was still fun, but it’s not the same like when you’re actually in the park out and about with the air and talking to other people it’s different, but it was fun.” (English-speaking female)</p>
Effectiveness	<p>Park-based class benefits: Social aspect of group setting; health benefits, learn new exercises;</p> <p>Virtual class benefits: Convenience to exercise at home and on own time; motivation to exercise; fun exercises; feeling connected to others online;</p> <p>A few (n = 5) noted preferences for in-person classes because virtual classes lacked social aspect and exposure to fresh air.</p> <ul style="list-style-type: none"> • Positive impacts across multiple levels <ul style="list-style-type: none"> Personal (n = 18): Lifestyle behaviors, physical and mental health benefits, and motivation to exercise; Social (n = 14): Building social connections and feeling motivated in group setting; Environmental (n = 3): Feeling safer in park; Virtual (n = 2): Increased confidence to use technology and virtual programs; Other (n = 2): Benefits for youth and older populations. 	<p>“I fell into depression, it was just laying around, without energy, not for talking or nothing. And then going out there, to the exercises, we’d get there, talk and at the same time laugh. Yes, it helped me, my mind was distracted and I wasn’t thinking about so many things.” (Spanish-speaking female)</p> <p>“Before, I didn’t do much exercise, nothing, because in 2015 I was sent to a specialist, a doctor, for problems with my back, and the doctor recommended surgery. I said I didn’t want it, that I wanted to think about it, but they told me if you don’t get the operation, in any moment, you’ll be disabled. That created some fear in me and I didn’t want to do anything, I spent my time sitting, watching TV; walking 10–15 min would make me feel bad, I was going backwards right? And then, I started to come to this program, which helped me, it took away the fear of exercising. It also took away a lot of the pain.” (Spanish-speaking male)</p>

(continued)

Table 3 (continued)

Theme	Main findings	Exemplary quotes
Implementation	<ul style="list-style-type: none"> • Multilevel facilitators to class participation Personal (n = 18 for park-based classes; n = 11 for virtual classes): Desire to improve health, being active, curious to try something new, needing motivation, having time, feeling safe to exercise at home; Social (n = 12 for park-based classes; n = 6 for virtual classes): Social support and connections; Program (n = 11 for park-based classes; n = 9 for virtual classes): Class schedule and frequency, instructor characteristics, staff support; Organizational (n = 3 for park-based classes; n = 0 for virtual classes): Support from church leaders for intervention activities; Environmental (n = 9 for park-based classes; n = 6 for virtual classes): Living close to park, park safety, social connections at park; having space at home to exercise; Virtual (n = 10 for virtual classes): Being comfortable using social media and having access to technology. • Multilevel barriers to class participation Personal (n = 15 for park-based classes; n = 7 for virtual classes): Lack of time, lack of transportation, health concerns, preference to exercise alone, lack of shoes, dislike of online classes, not seeing class reminders; Social (n = 7 for park-based classes; n = 9 for virtual classes): Family responsibilities, lack of social support, social media platform lacked social visibility; Program (n = 3 for park-based classes; n = 1 for virtual classes): Class schedule did not work for them; Organizational (n = 2 for park-based classes; n = 0 for virtual classes): Not observing support from church leadership; Environmental (n = 7 for park-based classes; n = 0 for virtual classes): Park safety concerns, traffic, lack of transportation, extreme heat, lack of programming, homelessness; Virtual (n = 17 for virtual classes): Low technological literacy, poor connection, lack of device, negative attitudes toward social media. 	<p><i>Personal facilitator</i>: “Because I live alone, I enjoy socializing with others, with other parishioners from my church, and we get together and talk about church and life, right? So that’s why I liked it and I’m happy to participate in any event that the church has, right?” (Spanish-speaking male)</p> <p><i>Social facilitator</i>: “There is a woman here [peer leader]. She would sometimes give me rides. Yes, because sometimes it [class] would end late and I’m afraid to be out at night. But she would show up and bring me.” (Spanish-speaking female)</p> <p><i>Program facilitator</i>: “Well, first of all, I liked that they were conducted by the instructors in Spanish and that made it easier, because here the community is more Spanish speaking than English, but they were able to relate to that and I got good feedback from the community, those who were watching it. For it was convenient and it worked out for them, because they would participate at that hour or at a later time after they were home from work.” (English-speaking female)</p> <p><i>Personal barrier</i>: “Well yes because I don’t have a car, I would just wait for my husband to return from work, and sometimes would get home a bit late and then there was no time to get there, and to go by bus it takes longer.” (Spanish-speaking female)</p> <p><i>Social barrier</i>: “You know how a family is, well you know that those of us with family still in school makes it hard to participate. Almost all those who participated were people without kids in school. So, it is harder.” (Spanish-speaking male)</p> <p><i>Virtual barrier</i>: “No, no, I have never understood how to use social media, only the telephone to talk and answer. My telephone is a Samsung number 2, imagine! I only bought it to make calls, because I have family in . . . But no, I am not on social media. No, I can’t use the internet. The only thing I know how to use a bit is WhatsApp and YouTube on the phone, it’s what I know how to use.” (Spanish-speaking female)</p>
Maintenance	<ul style="list-style-type: none"> • Postintervention PA plans Walking, fitness class, online videos, hike or swim, repeat intervention exercises and text message advice. • Facilitators to PA maintenance Personal (n = 10): Motivation, time, for health; Social (n = 10): Social support; Environmental (n = 4): Fresh air, safety, proximity to park; Other (n = 3): Access to materials to exercise, walking groups, family activities at park. • Barriers to PA maintenance Personal (n = 4): Time constraints, health issues; Social (n = 4): No social support; Environmental (n = 4): Poor weather, lack of access to PA facilities, safety concerns. 	<p>“I’m going to continue doing the exercises I learned from you all. Because I know it’s coming to an end. It will help to continue—doing the exercises, my blood sugar doesn’t go up, my pressure doesn’t—My pressure is fine, doing exercises and all that, but if I’m only sitting, I eat and eat, and my sugar goes up. I don’t exercise, and in two years—I’m 65 y old—I won’t be able to stretch, because bones atrophy, the junctures aren’t the same. That’s why it’s important to keep moving, walking, moving your arms.” (Spanish-speaking female)</p>

(continued)

Table 3 (continued)

Theme	Main findings	Exemplary quotes
COVID-19 Impacts	<ul style="list-style-type: none"> • Worsened health Decreased exercise due to health issues and local restrictions; Declining mental and physical health; Getting sick or losing loved one to COVID-19; Coping mechanisms: gardening, time outdoors, reading the bible, self-care. • Economic consequences Lost employment; inability to pay bills. • Mixed impacts on social health Greater caretaking; Loneliness vs social support. 	<p>“Unfortunately, I caught COVID-19, I got sick and it lasted a long time, but thanks to God we’re still here. The exercises helped us to stay healthy and have stronger defenses, it helped a lot.” (Spanish-speaking male)</p>
Recommendations for future PA programs	<ul style="list-style-type: none"> • Most recommend hybrid (virtual + park) program. • Church supports Faith leader/staff support; greater advertisement; church space for classes; walking groups; inviting ministries. • Other supports Transportation assistance; integrate faith into programming; education on PA and nutrition; incentives; etc 	<p>“There are a lot of people who have access to social media and don’t go to church, and there are people who go to church but don’t have social media. A lot of people don’t like to exercise so if they see it available in different formats that may get their attention because sometimes there are programs like this but we don’t take advantage of them.” (Spanish-speaking female)</p>

Abbreviations: PA, physical activity; TV, television.

top barriers were virtual and personal factors. Few cited organizational church factors as either a barrier or facilitator.

Most interviewees cited personal facilitators to participate in the park-based classes, such as a desire to improve one's health, and already being a physically active person. Similar factors were identified for the virtual classes, in addition to feeling safer exercising at home during the pandemic. There were several personal barriers for the park-based classes, such as lack of time, health issues, and lack of transportation. Personal barriers for the virtual classes included lack of time, dislike of online classes, and not seeing the class reminders.

For both types of classes, social facilitators included social support, including giving one another rides to the park, and exercising together, and having children to help set up the virtual classes, as well as opportunities to build social connections. For both types of classes, social barriers included family responsibilities and lack of social support, including no one to help set up their devices. For the virtual classes, a barrier was that one could not see other participants on the screen, only the instructor.

For both types of classes, common program facilitators included the convenient class schedule and good frequency; positive instructor characteristics such as patient, attentive, motivating, friendly; good class pace; and good program staff support. Few cited program barriers, including not knowing or not being able to make the class schedule because it was either too late or not late enough.

Facilitators to participation in virtual classes included being comfortable using social media and having good access to the internet and an appropriate device, such as smartphone or computer. Barriers to virtual class participation included low technological literacy, with several having little to no experience using social media or text messaging; unstable or poor internet connection; and lack of an appropriate device.

Environmental facilitators to participating in the park-based classes included living close to the park, familiarity with the park, and perceived park safety. Having adequate space at home was a facilitator to participating in the virtual classes. Environmental barriers to participating in the park-based classes included safety concerns, traffic, lack of public transportation, and extreme summer heat. A few interviewees noted environmental concerns they believed deterred others from participating in the park-based classes, including gang activity, drug use, lack of programming for residents, lack of parking, and homelessness. No one cited environmental barriers to participate in the virtual classes.

A few interviewees cited church organizational factors as either a facilitator or barrier. A facilitator was seeing support from church leaders for the intervention, such as encouraging participation, supporting the project coordinator, and offering church space for activities, not observing such support was a barrier.

Maintenance

Most interviewees noted they would walk to stay active postintervention; others suggested joining a fitness class, watching online videos, or doing their own exercises (Table 3). A few interviewees suggested they would repeat the intervention class exercises, apply advice from the text messages, or re-watch the recordings. Facilitators to staying active postintervention included personal self-motivation and having time, social support, safety in the neighborhood, and other factors such as access to materials to exercise and family-friendly activities at the park. In contrast, few barriers to PA maintenance were reported, including personal time

constraints, health issues, lack of social support like not having anyone to exercise with, and environmental barriers including poor weather, neighborhood safety concerns, and lack of access to exercise facilities.

COVID-19 Impacts

About half of interviewees reported lower levels of PA during the pandemic due to health challenges and local restrictions to using public spaces such as parks. Interviewees also perceived the pandemic worsened their mental and physical health and increased sedentary behaviors, though a few perceived their exercise/diet improved. Further, participants cited economic challenges such as job losses, reduced work hours, and an inability to pay bills. Those with children noted increased responsibilities to look after their kids doing online school and greater caretaking. Further, there were mixed perceived impacts on social well-being, including feeling alone or having more family support. Some interviewees reported they and/or their family or neighbors contracted COVID-19 and a few interviewees reported losing a loved one to COVID-19. A few interviewees also described coping mechanisms, such as spending time outside and reading the Bible with their family.

PA Intervention Recommendations

Most interviewees recommended a hybrid program, that is, park-based and virtual, for future PA interventions for Latino communities. Interviewees suggested church supports for future PA programs can include church leader/staff support, having more advertising, using church space for classes, organizing walking groups, and inviting youth and church groups/ministries to program activities. Other supports included transportation support; pairing classes with social activities, such as meals, integrating faith into programming, integrating education talks on PA and nutrition, and providing incentives such as raffles, food, and gift cards.

Discussion

Using the RE-AIM framework, this study found Parishes and Parks had good reach among interviewees, positive perceived impacts beyond PA, the potential to promote PA maintenance, and there were more facilitators than barriers to participation. Findings highlight the benefits across health and well-being domains from community multilevel approaches. It also points to the potential for virtual adaptations to enhance reach in Latino communities and promote well-being during public health emergencies. Further, identified challenges to class participation highlight areas for targeted strategies to enhance future implementation and scale-up.

Parishes and Parks leveraged the strengths of churches, such as trust and reach, and parks, including space and amenities to promote PA among Latinos; however, moving the classes to a virtual platform during the pandemic appeared to reach fewer participants. Other studies have also suggested that Spanish-speaking and older Latinos prefer in-person health programs over online programs.^{21,41} This study also identifies psychosocial motivations for engaging with in-person programs, including desires for socialization and connection to nature, aligning with other studies pointing to the social and mental health benefits of exercising outdoors.^{42,43}

Despite the lower reach of the virtual classes, they offered an opportunity to remain active when the pandemic created barriers to

exercising. Although interviewees suggested they preferred park-based classes, most recommended a hybrid park-based and virtual PA program in the future. This unexpected finding is potentially rooted in Latinos' cultural value of collectivism to support the whole community over centering individual preferences.⁴⁴

Overall, studies globally show mobility and PA decreased during the pandemic while sedentary behaviors increased.⁴⁵ Thus, the present qualitative findings suggest Parishes and Parks may have filled a critical need in the community. In particular, interviewees highlighted how text messages provided an opportunity to stay engaged with the intervention and motivation to remain active. Thus, while the pandemic may have exacerbated or created new barriers to exercise, Parishes and Parks still appeared to reach participants and help them stay motivated to exercise, including individuals who could not participate in the in-person park classes but were able to attend for the first time through the virtual classes.

In terms of the effectiveness domain, interviewees revealed broad perceived impacts across a range of outcomes, with the most common being personal health and social benefits. Although evidence of the intervention's effectiveness is forthcoming in a future publication, these findings are promising and align with another qualitative study of the 3 WINS Fitness program.⁴³ Findings also align with quantitative studies showing the health benefits of community-based PA interventions among Latino¹⁷ and older adult⁴⁶ populations. In particular, Parishes and Parks promoted PA in parks, which is associated with better mental well-being compared to indoor PA.⁴⁷ Text messaging interventions have also been found to be acceptable among churchgoing Latino populations⁴⁸ and effective in promoting PA⁴⁹ and health.⁵⁰

An additional finding was the perceived impacts on social health. Although larger social networks and social support are associated with Latinos' PA,^{51,52} few evaluations have examined the impacts of PA interventions on Latinos' social outcomes. A meta-analysis of PA intervention trials found that group exercise settings promote social functioning.⁵³ Further, a qualitative study of the 3 WINS Fitness program found the program promoted social connections, including camaraderie, friendship, community, and family, among both the student instructors and predominantly Latino participants.⁴³ This finding aligns with the present study suggesting Parishes and Parks may have promoted social connections with fellow parishioners.

Interviewees also noted the intervention may have benefited their children, which is consistent with an evaluation of another faith-based obesity prevention intervention for African American and Latino adults.⁵⁴ Given churches have wide reach among Latino families, future PA interventions may consider enhancing support from participants' existing social networks.⁵²

This study also found limited evidence for improving technological literacy among those who attended the virtual classes. To our knowledge, no evaluation has examined the impacts of an online PA intervention on Latinos' technological literacy. Future work is needed to understand effective strategies to close the digital divide for advancing health equity.⁵⁵

In the implementation domain, virtual factors were key determinants of participating in the online classes. Virtual barriers included lack of familiarity with social media or text messaging, and unstable internet. Some interviewees were more familiar with WhatsApp and YouTube. However, Facebook is the most commonly used social media platform, followed by YouTube, among Latinos, regardless of language preference.^{56,57} Future studies may consider using multiple platforms to reach a broader audience. Our findings also point to the value of providing technological support

to enhance engagement and virtual strategies, such as exercise videos and text messages, to support PA. This is in line with another study that found technological support is important for increasing willingness to participate in online exercise programs.⁵⁸ Additional factors that may have promoted equitable access to the online classes included making the social media page public thereby removing the requirement to create an account, and saving video recordings to view at any time. Nevertheless, interviewees noted Facebook was limited in promoting social connections, as it did not allow one to see other participants in the class. Overall, findings point to the benefits and drawbacks of a virtual PA intervention for a predominantly Spanish-speaking, older Latino population with low technological literacy.

In contrast, environmental barriers and facilitators were most relevant to the park-based classes. Facilitators included park proximity, familiarity, safety, and social cohesion, while common barriers included concerns about park safety and access such as transportation barriers. Parishes and Parks was designed to address park environmental barriers through environmental advocacy; however, this component was not carried out for cohort 1 due to pandemic restrictions. The advocacy training was implemented with cohort 2 and will be evaluated in a future paper. Past studies have pointed to the benefits of addressing environmental barriers through community-led strategies.⁵⁹

Interviewees identified several personal motivations such as a desire to improve one's health; social support; and program facilitators, including having supportive staff, promoted participation in the park-based or virtual classes. Personal barriers, particularly lack of time, were also frequently cited, while lack of social support and program barriers, such as conflicts with the class schedule, was less common. Other studies have also identified multilevel factors associated with Latinos' PA.^{14,60} Overall, findings suggest Parishes and Parks was effective in addressing social- and program-level barriers. However, several personal barriers are more complex and reflect circumstances potentially driven by upstream, structural inequities. Future PA interventions may need to partner with local agencies, such as transportation, health care, and workforce services, to facilitate access to appropriate supports to ensure programs are accessible to all.

Organizational factors were the least cited determinants of class participation. Another study suggests church factors, such as faith leader support and church culture are important for supporting engagement in a faith-based PA intervention.²³ However, interviewees may have placed more weight on factors with more direct influences in their lives, including personal and social factors, than the broader congregation for determining whether to participate. The pandemic also restricted in-person mass for extended periods of time, which resulted in pausing the intervention's component of integrating PA in the sermons. Even after local restrictions were lifted, priests felt the need to focus on "essential" activities, such as sacraments, for some time. This may have resulted in reduced visibility of the faith leaders' role in the intervention. Nevertheless, interviewees recognized the churches' role in promoting parishioners' participation in future interventions, such as offering space for activities and promoting engagement of church groups.

Finally, for the maintenance domain, most interviewees planned to stay active postintervention through walking. Some interviewees noted they were going to continue what they learned or use resources provided by Parishes and Parks, particularly the text messages and video recordings. One study of an internet-based intervention with Spanish-speaking Latinas, which involved continued access to the website during the 6-month maintenance

phase, also found sustained improvements in PA.⁶¹ Future interventions may consider integrating technology-based strategies, such as website, video recordings, and text messages, to support PA maintenance.

Some of the same facilitators and barriers that influenced interviewees' ability to participate in Parishes and Parks also came up as determinants of PA maintenance, but this time interviewees reported fewer barriers. Further, several interviewees noted when they could not participate in intervention classes, particularly during the pandemic, they engaged in other forms of PA, suggesting Parishes and Parks may have helped participants overcome or navigate barriers to PA to stay active. Few studies have examined maintenance in the context of faith-based PA interventions.⁶² Although this study focused on PA maintenance in a hypothetical sense, findings point to the potential of Parishes and Parks to promote sustained PA change and identify key determinants to support sustained behaviors.

This study had several strengths. By using the socioecological framework with RE-AIM, we obtained rich insights about multi-level barriers and facilitators to participation as well as multilevel perceived intervention impacts. Nevertheless, a limitation of this study is the possibility that those who did not participate in the intervention also declined to participate in interviews, thus there may be additional barriers not captured in this study. Further, perspectives on PA maintenance could only be assessed through hypothetical inquiry and we could not assess maintenance at the church-level. Interviews with church staff would be needed to understand intervention sustainability.

Conclusions

In conclusion, this study points to the utility of RE-AIM for evaluating the translation potential and broad public health impacts of a faith-based PA intervention aimed to advance PA equity in the Latino population. Participants' perspectives provided rich insights into their experiences and recommendations for strengthening the implementation and sustainability of faith-based PA interventions for the Latino community. Although effectiveness evidence is important for understanding what works, such data may be insufficient for translating interventions to real-world settings. Thus, this study points to the value and need for more implementation research of equity-centered interventions.

Acknowledgments

We would like to thank the Parishes and Parks study team for their assistance on the project intervention activities and data collection efforts.

Funding Sources: This work was funded by the National Cancer Institute (R01CA218188). The lead author was funded by a Diversity Supplement from the National Cancer Institute (3R01CA218188-03S2).

References

- Physical Activity Guidelines Advisory Committee. *Physical Activity Guidelines Advisory Committee Scientific Report*. US Department of Health and Human Services; 2018.
- White RL, Babic MJ, Parker PD, Lubans DR, Astell-Burt T, Lonsdale C. Domain-specific physical activity and mental health: a meta-analysis. *Am J Prev Med*. 2017;52(5):653–666. doi:10.1016/j.amepre.2016.12.008
- Samitz G, Egger M, Zwahlen M. Domains of physical activity and all-cause mortality: systematic review and dose–response meta-analysis of cohort studies. *Int J Epidemiol*. 2011;40(5):1382–1400. doi:10.1093/ije/dyr112
- Raza W, Krachler B, Forsberg B, Sommar JN. Health benefits of leisure time and commuting physical activity: a meta-analysis of effects on morbidity. *J Transp Health*. 2020;18:100873. doi:10.1016/j.jth.2020.100873
- Watson KB, Whitfield G, Chen TJ, Hyde ET, Omura JD. Trends in aerobic and muscle-strengthening physical activity by race/ethnicity across income levels among US adults, 1998–2018. *J Phys Act Health*. 2021;18(suppl 1):S45–S52. doi:10.1123/jpah.2021-0260
- Centers for Disease Control and Prevention. Adult physical inactivity prevalence maps by race/ethnicity. <https://www.cdc.gov/physicalactivity/data/inactivity-prevalence-maps/index.html>. Accessed February 7, 2024.
- Stommel M, Schoenborn CA. Variations in BMI and prevalence of health risks in diverse racial and ethnic populations. *Obesity*. 2010; 18(9):1821–1826. doi:10.1038/oby.2009.472
- Hales CM, Carroll MD, Fryar CD, Ogden CL. Prevalence of obesity among adults and youth: United States, 2015–2016. 2024. <https://www.cdc.gov/nchs/products/databriefs/db288.htm>. Accessed February 7, 2024.
- Derose KP, Rodriguez C. A systematic review of church-based health interventions among Latinos. *J Immigr Minor Health*. 2020;22(4): 795–815. doi:10.1007/s10903-019-00941-2
- Florez KR, Payan DD, Palar K, Williams MV, Katic B, Derose 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. doi:10.1093/nutrit/nuz046
- Loya JC. Systematic review of physical activity interventions in Hispanic adults. *Hisp Health Care Int*. 2018;16(4):174–188. doi:10.1177/1540415318809427
- Perez LG, Arredondo EM, Elder JP, Barquera S, Nagle B, Holub CK. Evidence-based obesity treatment interventions for Latino adults in the U.S.: a systematic review. *Am J Prev Med*. 2013;44(5):550–60. doi:10.1016/j.amepre.2013.01.016
- Reis RS, Salvo D, Ogilvie D, Lambert EV, Goenka S, Brownson RC. Scaling up physical activity interventions worldwide: stepping up to larger and smarter approaches to get people moving. *Lancet*. 2016; 388(10051):1337–1348. doi:10.1016/s0140-6736(16)30728-0
- Larsen BA, Noble ML, Murray KE, Marcus BH. Physical activity in Latino men and women: facilitators, barriers, and interventions. *Am J Lifestyle Med*. 2015;9(1):4–30. doi:10.1177/1559827614521758
- Sallis JF, Owen N, Fisher E. Ecological models of health behavior. *Health Behav: Theory Res Prac*. 2015;5:43–64.
- Richard L, Gauvin L, Raine K. Ecological models revisited: their uses and evolution in health promotion over two decades. *Annu Rev Public Health*. 2011;32(1):307–326. doi:10.1146/annurev-publhealth-031210-101141
- Ickes MJ, Sharma M. A systematic review of physical activity interventions in Hispanic adults. *J Environ Public Health*. 2012; 2012:156435. doi:10.1155/2012/156435
- Arredondo EM, Elder JP, Haughton J, et al. Fe en Acción: promoting physical activity among churchgoing Latinas. *Am J Public Health*. 2017;107(7):1109–1115. doi:10.2105/AJPH.2017.303785
- Derose KP, Williams MV, Flórez KR, et al. Eat, pray, move: a pilot cluster randomized controlled trial of a multilevel church-based intervention to address obesity among African Americans and Latinos. *Am J Health Promot*. 2019;33(4):586–96. doi:10.1177/0890117118813333

20. Bolger D, Prickett PJ. Where would you go? Race, religion, and the limits of pastor mental health care in Black and Latino congregations. *Religions*. 2021;12(12):1062. doi:10.3390/rel12121062
21. Cristancho S, Peters K, Garces M. Health information preferences among Hispanic/Latino immigrants in the U.S. rural Midwest. *Glob Health Promot*. 2014;21(1):40–49. doi:10.1177/1757975913510727
22. Wende ME, Kaczynski AT, Bernhart JA, Dunn CG, Wilcox S. Objective church environment audits and attendee perceptions of healthy eating and physical activity supports within the church setting. *Int J Environ Res Public Health*. 2020;17(10):3598. doi:10.3390/ijerph17103598
23. Houghton J, Takemoto ML, Schneider J, et al. Identifying barriers, facilitators, and implementation strategies for a faith-based physical activity program. *Implementation Sci Commun*. 2020;1:51. doi:10.1186/s43058-020-00043-3
24. Camplain R, Sotres-Alvarez D, Alvarez C, et al. The association of acculturation with accelerometer-assessed and self-reported physical activity and sedentary behavior: The Hispanic Community Health Study/Study of Latinos. *Prev Med Rep*. 2020;17:101050. doi:10.1016/j.pmedr.2020.101050
25. Perez LG, Carlson J, Slymen DJ, et al. Does the social environment moderate associations of the built environment with Latinas' objectively-measured neighborhood outdoor physical activity? *Prev Med Rep*. 2016;4:551–557. doi:10.1016/j.pmedr.2016.10.006
26. Perez LG, Slymen DJ, Sallis JF, Ayala GX, Elder JP, Arredondo EM. Interactions between individual and perceived environmental factors on Latinas' physical activity. *J Public Health*. 2016;39(2):e10–e18. doi:10.1093/pubmed/fdw061
27. Eccles MP, Mittman BS. Welcome to implementation science. *Implement Sci*. 2006;1:5908. doi:10.1186/1748-5908-1-1
28. Compernelle S, De Cocker K, Lakerveld J, et al. A RE-AIM evaluation of evidence-based multi-level interventions to improve obesity-related behaviours in adults: a systematic review (the SPOT-LIGHT project). *Int J Behav Nutr Phys Act*. 2014;11:147. doi:10.1186/s12966-014-0147-3
29. Glasgow RE, Askew S, Purcell P, et al. Use of RE-AIM to address health inequities: application in a low-income community health center-based weight loss and hypertension self-management program. *Transl Behav Med*. 2013;3(2):200–210. doi:10.1007/s13142-013-0201-8
30. Glasgow RE, Vogt TM, Boles SM. Evaluating the public health impact of health promotion interventions: the RE-AIM framework. *Am J Public Health*. 1999;89(9):1322–1327. doi:10.2105/ajph.89.9.1322
31. Shelton RC, Chambers DA, Glasgow RE. An extension of RE-AIM to enhance sustainability: addressing dynamic context and promoting health equity over time. *Front Public Health*. 2020;8:134. doi:10.3389/fpubh.2020.00134
32. Whitley MD, Perez LG, Castro G, Larson A, Derose KP. Modifying text messages from a faith-based physical activity intervention with Latino adults in response to the COVID-19 pandemic. *Community Health Equity Res Policy*. 2024;44(4):399–407. doi:10.1177/2752535x221150009
33. Wingood M, Peters DM, Gell NM, Brach JS, Bean JF. Physical activity and physical activity participation barriers among adults 50 years and older during the COVID-19 pandemic. *Am J Phys Med Rehabil*. 2022;101(9):809–815. doi:10.1097/phm.00000000000002041
34. Gomes R, Battaglia C, Fort M, et al. *A Guidebook to the Pragmatic and Iterative Use of the Practical, Robust Implementation and Sustainability Model (PRISM) and Reach, Effectiveness, Adoption, Implementation, Maintenance framework (RE-AIM) for Planning, Implementation, and Sustainment*. Colorado Implementation Science Center in Cancer Control; 2024. https://medschool.cuanschutz.edu/docs/librariesprovider94/di-docs/guides-and-tools/iprism-and-reaim-guidebook_wip.pdf?sfvrsn=adea27bb_0. Accessed July 15, 2024.
35. Derose KP, Cohen DA, Han B, et al. Linking churches and parks to promote physical activity among Latinos: rationale and design of the Parishes & Parks cluster randomized trial. *Contemp Clin Trials*. 2022;123:106954. doi:10.1016/j.cct.2022.106954
36. Rodríguez AM, Neher T, Toevs SE. Successes and barriers identified by public health professionals engaging Hispanic communities. *J Latinx Psychol*. 2024;10:264. doi:10.1037/lat0000264
37. Loy S. 3 WINS fitness: sustainable, affordable, and scalable fitness program for the next generation. *J Phys Act Health*. 2019;16(4):241–242. doi:10.1123/jpah.2019-0030
38. Dedoose. *Cloud Application for Managing, Analyzing, and Presenting Qualitative and Mixed Method Research Data*. Socio Cultural Research Consultants, LLC; 2021. www.dedoose.com
39. Bingham AJ, Witkowsky P. Deductive and inductive approaches to qualitative data analysis. In: Vanover C, Mihas P, Saldana J, eds. *Analyzing and Interpreting Qualitative Data: After the Interview*. Sage; 2021:133–146.
40. Uebersax J. Calculating Kappa with SAS®. <https://john-uebersax.com/stat/saskappa.htm>
41. Au LE, Whaley S, Gurzo K, Meza M, Ritchie LD. If you build it they will come: satisfaction of WIC participants with online and traditional in-person nutrition education. *J Nutr Educ Behav*. 2016;48(5):336–342 e1. doi:10.1016/j.jneb.2016.02.011
42. Twohig-Bennett C, Jones A. The health benefits of the great outdoors: a systematic review and meta-analysis of greenspace exposure and health outcomes. *Environ Res*. 2018;166:628–637. doi:10.1016/j.envres.2018.06.030
43. Chaudhari LS, Lang-Balde R, Carlos J, Loy S. Qualitative analysis of a kinesiology student-led sustainable exercise program targeting underserved communities. *J Phys Act Health*. 2022;19(12):820–827. doi:10.1123/jpah.2022-0277
44. Gaines SO Jr, Marelich WD, Bledsoe KL, et al. Links between race/ethnicity and cultural values as mediated by racial/ethnic identity and moderated by gender. *J Pers Soc Psychol*. 1997;72(6):1460–1476. doi:10.1037/0022-3514.72.6.1460
45. Park AH, Zhong S, Yang H, Jeong J, Lee C. Impact of COVID-19 on physical activity: a rapid review. *J Glob Health*. 2022;12:5003. doi:10.7189/jogh.12.05003
46. Tcymbal A, Abu-Omar K, Hartung V, et al. Interventions simultaneously promoting social participation and physical activity in community living older adults: a systematic review. *Front Public Health*. 2022;10:1048496. doi:10.3389/fpubh.2022.1048496
47. Coon TJ, Boddy K, Stein K, Whear R, Barton J, Depledge MH. Does participating in physical activity in outdoor natural environments have a greater effect on physical and mental wellbeing than physical activity indoors? A systematic review. *Environ Sci Technol*. 2011;45(5):1761–1772. doi:10.1021/es102947t
48. Whitley MD, Payan DD, Florez KR, et al. Feasibility and acceptability of a mobile messaging program within a church-based healthy living intervention for African Americans and Latinos. *Health Inform J*. 2020;26(2):880–896. doi:10.1177/1460458219853408
49. Smith DM, Duque L, Huffman JC, Healy BC, Celano CM. Text message interventions for physical activity: a systematic review and meta-analysis. *Am J Prev Med*. 2020;58(1):142–151. doi:10.1016/j.amepre.2019.08.014
50. Hall AK, Cole-Lewis H, Bernhardt JM. Mobile text messaging for health: a systematic review of reviews. *Annu Rev Public Health*. 2015;36(1):393–415. doi:10.1146/annurev-publhealth-031914-122855

51. Marquez B, Elder JP, Arredondo EM, Madanat H, Ji M, Ayala GX. Social network characteristics associated with health promoting behaviors among Latinos. *Health Psychol.* 2014;33(6):544–553. doi:10.1037/hea0000092
52. Soto SH, Arredondo EM, Haughton J, Shakya H. Leisure-time physical activity and characteristics of social network support for exercise among Latinas. *Am J Health Promot.* 2018;32(2):432–439. doi:10.1177/0890117117699927
53. Shvedko A, Whittaker AC, Thompson JL, Greig CA. Physical activity interventions for treatment of social isolation, loneliness or low social support in older adults: a systematic review and meta-analysis of randomised controlled trials. *Psychol Sport Exerc.* 2018; 34:128–137. doi:10.1016/j.psychsport.2017.10.003
54. Perez LG, Flórez KR, Seelam R, Williams MV, Derose KP. Effects of a faith-based obesity intervention on African American and Latino adults' children. *Community Health Equity Res Policy.* 2024;10:5992. doi:10.1177/2752535x241235992
55. Arias López MDP, Ong BA, Borrat Frigola X, et al. Digital literacy as a new determinant of health: a scoping review. *PLoS Digital Health.* 2023;2(10):e0000279. doi:10.1371/journal.pdig.0000279
56. Pew Research Center. Social media preferences vary by race and ethnicity. 2024. <https://www.pewresearch.org/short-reads/2015/02/03/social-media-preferences-vary-by-race-and-ethnicity/>. Accessed February 19, 2024.
57. Abrajano MGM, Pope A, Vidigal R, Kamau E, Tucker JA, Nagler J. Social media, information, and politics: insights on Latinos in the U.S. 2022. <https://csmapnyu.org/research/academic-research/social-media-information-and-politics-insights-on-latinos-in-the-u-s>. Accessed February 19, 2024.
58. Suderman K, Skene T, Sellar C, et al. Virtual or in-person: a mixed methods survey to determine exercise programming preferences during COVID-19. *Curr Oncol.* 2022;29(10):6735–6748. doi:10.3390/curroncol29100529
59. Arredondo E, Mueller K, Mejia E, Rovira-Oswalder T, Richardson D, Hoos T. Advocating for environmental changes to increase access to parks: engaging promotoras and youth leaders. *Health Promot Pract.* 2013;14(5):759–766. doi:10.1177/1524839912473303
60. Perez LG, Kerr J, Sallis JF, et al. Perceived neighborhood environmental factors that maximize the effectiveness of a multilevel intervention promoting physical activity among Latinas. *Am J Health Promot.* 2018;32(2):334–343. doi:10.1177/0890117117742999
61. Hartman SJ, Dunsiger SI, Bock BC, et al. Physical activity maintenance among Spanish-speaking Latinas in a randomized controlled trial of an Internet-based intervention. *J Behav Med.* 2017;40(3):392–402. doi:10.1007/s10865-016-9800-4
62. Dunn CG, Wilcox S, Saunders RP, Kaczynski AT, Blake CE, Turner-McGrievy GM. Healthy eating and physical activity interventions in faith-based settings: a systematic review using the reach, effectiveness/efficacy, adoption, implementation, maintenance framework. *Am J Prev Med.* 2021;60(1):127–35. doi:10.1016/j.amepre.2020.05.014

Appendix 1: Interview Protocol

Text in italics is instructions for the interviewer (not to be read).

1. In 2019, Parishes and Parks was offering your church some exercise classes at the nearby park [PARK NAME] 2 to 3 times a week in the evenings and sometimes on the weekends. Do you remember attending any of those classes?
 - a. *If yes* →
 - i. Can you tell me a little bit about that experience?
 - ii. What motivated you to participate in those classes?
 - iii. Were there times when you couldn't attend, and if so, what made it difficult for you to attend those classes? [*see PROBE*]
 - b. *If no* → What made it difficult for you to attend the classes in the parks? [*see PROBE*]
 PROBE: if not mentioned by participant, ask about factors at multiple levels:
 - personal (eg, *self-efficacy to do PA; transportation*),
 - social (eg, *family/work obligations, social support*),
 - program (eg, *class schedule; class frequency/length; role of class instructors; language of classes; type of exercises; role of peer leaders in motivating attendance*),
 - organizational (eg, *role of church leaders; church support for health behaviors*), or
 - environmental (eg, *concerns about park or surrounding neighborhood*)
2. When the pandemic started, we could no longer offer the classes in the parks, so Parishes and Parks designed a new exercise program on Facebook live, these classes started in October of 2020 and were offered 4 times a week, mostly on evenings and Saturday mornings. Did you ever attend one of those classes on Facebook?
 - a. *If yes* →
 - i. Can you tell me a little bit about that experience?
 - ii. What motivated you to participate in those classes?
 - iii. Were there times when you couldn't attend, and if so, what made it difficult for you to attend those classes? [*see PROBE*]
 - b. *If no* → What made it difficult for you to attend the classes on Facebook? [*see PROBE*]
 PROBE: if not mentioned by participant, ask about factors at multiple levels:
 - personal (eg, *self-efficacy to do PA*),
 - virtual (eg, *ability to use Facebook; technology access; internet access*)
 - social (eg, *family/work obligations; social support; role of peer leaders*),
 - program (eg, *class schedule; class frequency/length; role of class instructors; language of classes; type of exercises*),
 - organizational (eg, *role of church leaders; church support for health behaviors*), or
 - environmental (eg, *space at home*)
3. The online class videos were also posted on the Facebook page so anyone could watch the videos at any time. Did you ever watch the videos on your own time (ie, not during the live class session)?
 - a. *If yes* →
 - i. Can you tell me a little bit about that experience watching the videos on your own time?
 - ii. What did you like about having unlimited access to the videos?
 - iii. What did you not like about this option? (eg, *no interaction with instructor or other participants*)
 - b. *If no* → What made it difficult for you to watch the videos during your free time? [*see PROBE*]
 PROBE: if not mentioned by participant, ask about factors at multiple levels:
 - personal (eg, *self-efficacy to do PA*),
 - virtual (eg, *ability to use Facebook; technology access; internet access*)
 - social (eg, *family/work obligations; social support*),
 - program (eg, *role of class instructors; language of classes; type of exercises; role of peer leaders*),
 - organizational (eg, *role of church leaders; church support for health behaviors*), or
 - environmental (eg, *space at home*)

4. [Ask *ONLY* if they reported attending either type of class] You mentioned attending the [PARK and/or ONLINE] classes offered by Parishes and Parks, how do you think the program has impacted you? [see *PROBE*]

PROBE: if not mentioned by participant, ask about effects on the following:

- physical activity,
- physical and/or mental health,
- personal factors (eg, self-efficacy to do PA),
- social factors (eg, changes in social support from others; motivated others to exercise; connection to other parishioners),
- environmental factors (eg, changes in perceptions about the park near the church; creating space at home for exercise),
- virtual factors, if applicable (eg, changes in ability to use virtual programs on social media)

5. In addition to the classes, Parishes and Parks sent you some text messages about the importance of physical activity, do you remember receiving those messages?

a. *If yes* →

- i. Did you find them motivating? [If so, how did it motivate you? If not, why did you not find them motivating?] Is there an example of a message that you found particularly motivating?
- ii. How useful were the messages during the pandemic?
- iii. How do you think the text messages affected you? [see *PROBE*]

PROBE: if not mentioned by participant, ask about effects on the following:

- physical activity,
- physical and/or mental health,
- personal factors (eg, self-efficacy to do PA),
- social factors (eg, motivated individual to seek social support from others; motivated individual to support others to exercise; connection to church),
- environmental factors (eg, creating space at home for exercise).

a. *If no* → move to next question

6. After the Parishes and Parks program ends, what do you plan to do for exercise?

a. What would help support you to do that? [see *PROBE*]

b. What would make it difficult for you to do that? [see *PROBE*]

PROBE: if not mentioned by participant, ask about the following:

- personal factors (eg, self-efficacy to do PA; competing demands/responsibilities),
- social factors (eg, social support from others),
- environmental factors (eg, access to park or other recreational facility; neighborhood environment; space at home for exercise),
- virtual factors, if applicable (eg, access to virtual programs)

7. Now I want to ask you a few questions about the COVID-19 pandemic and how it might have affected you.

a. Think about the beginning of the pandemic, how did this crisis affect your ability to engage in physical activity? [see *PROBE*]

PROBE: if not mentioned by participant, ask about the following:

- local restrictions (eg, reduced access or closure of parks/open spaces or gyms/recreational facilities);
- changes to employment and/or economic situation;
- changes to family obligations;
- loss of loved one (due to COVID-19 or other reason)

a. [Ask *ONLY* if they mention reducing or stopping PA] How do you think [decreasing/stopping] physical activity during the pandemic has affected your health?

b. [Ask *ONLY* if they mention increasing or starting PA or maintaining active] How do you think [starting/maintaining/increasing] physical activity during the pandemic has affected your health? What motivated you to start/keep exercising?

8. Finally, I want to ask about your thoughts on how to develop an exercise program for other churches in the future. Would you recommend promoting physical activity classes in parks only, social media only, or both?

a. Why do you recommend this approach?

b. What kinds of exercise classes would you like to see as part of this program?

c. What kind of support could the church provide to help promote parishioner participation in such a program?

d. Is there anything else that could help support participation among parishioners, aside from any church support?

9. We are at the end of the interview, but I would like to finish by asking if there is anything else you want to share about the topic of physical activity or exercise programs for the Latino community?