

Community Partnership to Co-Develop an Intervention to Promote Equitable Uptake of the COVID-19 Vaccine Among Pediatric Populations

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Data Statement

The data are available from authors upon reasonable request.

Abstract

Objective: To describe the process of engaging community, caregiver, and youth partners in codeveloping an intervention to promote equitable uptake of the COVID-19 vaccine in non-

Hispanic Black (Black) and Hispanic youth who experience higher rates of COVID-19 transmission, morbidity, and mortality but were less likely to receive the COVID-19 vaccine.

Methods: A team of 11 Black and Hispanic community partners was assembled to codevelop intervention strategies with our interdisciplinary research team. We used a mixed-methods crowdsourcing approach with Black and Hispanic youth (n=15) and caregivers of Black and Hispanic youth (n=20) who had not yet been vaccinated against COVID-19, recruited from primary care clinics, to elicit perspectives on the acceptability of these intervention strategies.

Results: We codeveloped five strategies: (1) community-tailored handouts and posters, (2) videos featuring local youth, (3) family-centered language to offer vaccines in the primary care clinic, (4) communication-skills training for primary care providers, and (5) use of community health workers to counsel families about the vaccine. The majority (56-96.9%) of youth and caregivers rated each of these strategies as acceptable, especially because they addressed common concerns and facilitated shared decision-making. **Conclusions:** Engaging community and family partners led to the co-development of culturally- and locally-tailored strategies to promote dialogue and shared decision-making about the COVID-19 vaccine. This process can be used to codevelop interventions to address other forms of public health disparities.

Policy Implications: Intervention strategies that promote dialogues with trusted healthcare providers and support shared decision-making are acceptable strategies to promote COVID-19 vaccine uptake among youth from historically underserved communities. Stakeholder-engaged methods may also help in the development of interventions to address other forms of health disparities.

Introduction

Youth who identify as non-Hispanic Black (Black) or Hispanic have higher rates of COVID-19 morbidity and mortality than non-Hispanic White (White) youth.^{1,2} Despite the safety and efficacy of COVID-19 vaccines,³⁻⁵ there are universally lower vaccination rates among Black youth compared with White youth^{2,6} and lower vaccination rates for Hispanic youth in some states compared with White youth.⁶ Furthermore, COVID-19 vaccination rates across the nation have plateaued.⁶ To protect underrepresented pediatric populations from the impact of COVID-19, it is imperative to promote equitable uptake of COVID-19 vaccines.

Inequitable COVID-19 vaccine uptake is due to a combination of factors including vaccine hesitancy⁷ and systemic barriers to accessing the vaccine.^{8,9} Prior work highlighted that caregivers of Black youth and youth from socioeconomically disadvantaged communities were less likely to intend to vaccinate their child against COVID-19 and viewed the vaccine as less safe and effective.¹⁰⁻¹² Prior work also demonstrated the importance of who communicates with families about the COVID-19 vaccine, with parents of all sociodemographic backgrounds viewing their child's pediatrician as the most trusted source of information.^{11,12} Finally, lower digital literacy and language barriers may make it difficult for families to schedule appointments to vaccinate their children against COVID-19.⁸ Therefore, interventions to promote equitable COVID-19 vaccine uptake in pediatric populations should increase awareness about the benefits and safety of the COVID-19 vaccine and decrease barriers to accessing the vaccine.¹³

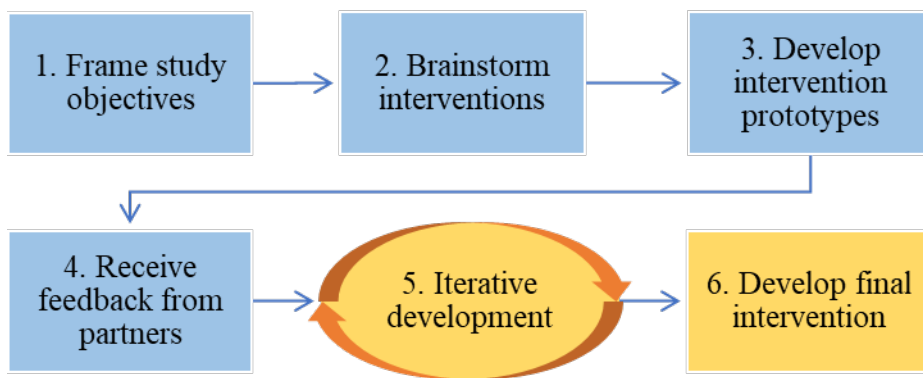
Interventions to reduce racial and ethnic disparities in COVID-19 vaccine uptake in pediatric populations are lacking. Multicomponent, dialogue-based interventions that are tailored to community-specific concerns have reduced hesitancy around influenza and human papillomavirus vaccines.¹⁴ Successful interventions also incorporated educational materials tailored to communities' concerns,^{15,16} stories from trusted persons,^{15,17} motivational

interviewing,^{18,19} and community health workers.^{20,21} The current study aimed to develop a multicomponent intervention to equip trusted messengers with the tools and resources necessary to promote COVID-19 vaccine uptake among Black and Hispanic pediatric populations, working with community and patient partners to ensure the intervention was culturally-tailored and community-informed.^{22,23}

Overview of Co-Development Process

Our process for codeveloping and refining the intervention (Figure 1) was informed by models proposed by Leask et al.²⁴ and Wallerstein et al.²⁵ Throughout the co-development process, we utilized strategies from New Mexico's Engage for Equity Promising Practices Guide,²⁶ a set of practices for conducting community-based participatory research that has empirical support²⁷; has been applied to socioeconomic, racial, and ethnic disparities in COVID-19²⁸; and demonstrated utility in developing and disseminating culturally-tailored, health promotion interventions to community partners.²⁹ We divided our process into two phases. In Phase 1, we worked with community partners to codevelop intervention strategies. In Phase 2, we elicited feedback on these strategies from youth who had yet to get the COVID-19 vaccine and/or their caregivers, which we then used to iteratively refine the intervention. As these phases were sequential, we first present the methods and results of Phase 1 and then the methods and results of Phase 2. The Institutional Review Board approved the procedures for this project.

Figure 1. Process for Co-Developing Intervention



Positionality Statement

We acknowledge that the racial, ethnic, socioeconomic, and educational backgrounds of the research team influence the research being conducted. The research team for this project is demographically and professionally diverse. One author (ML) is active in the community, advocating for efforts to promote health and well-being of community members across Delaware. We acknowledge that our professional and personal backgrounds may affect how we approached the process of codeveloping interventions and the interpretation of findings. The research team worked to develop culturally sensitive research methods, had regular discussions to ensure the study was guided by their cultural knowledge, and worked closely with community partners (described in more detail in the next section) to incorporate the community's perspective when codeveloping the intervention and interpreting findings.

Phase 1: Co-Development of Intervention with Community Partners

Phase 1 Methods

We employed steps 1-4 (Figure 1) to co-develop interventions in both English and Spanish.

Identifying Partners

We worked with an advisory committee consisting of health care and policy professionals with connections to Black and Hispanic community groups and expertise in community engagement to identify community partners, with consideration of community history/context and partner capacity, to develop the proposed intervention. The advisory committee helped identify 16 potential partners from the Black and Hispanic communities, including leaders from local youth groups, religious organizations, and local community advocacy groups. These potential partners were then contacted via email; 10 partners representing Black (n = 7) and Hispanic (n = 3) communities initially agreed to serve as a community partner. The final group represented youth leaders from youth or community groups (n = 4), religious leaders (n = 2), advocacy groups for communities of color (n = 3), and a community health worker (n = 1). After the first meeting, we sought to include more input from the Hispanic communities. Therefore, at the recommendation of our advisory committee, we recruited a parent who identified as Hispanic and a leader from a community center serving Hispanic families. This resulted in a total of 12 community partners by the third meeting.

Engaging Partners

We engaged partners across eight meetings held approximately once per month. Meetings were held by video conference and at two different times each month (over a lunch hour and after work hours) to facilitate participation. In addition, we used practices from the New Mexico's Engage for Equity Promising Practices Guide to develop shared values, integrate historical and cultural contexts, and promote productive dialogue. We utilized parts of Wallerstein and colleagues' Community Engagement Survey to assess synergy of the partnership after meetings.³⁰ Community partners used a 6-point Likert scale (ranging from 1 to 6) to rate the synergy of the partnership, with higher scores indicating greater synergy. Engagement practices were refined, as needed, based on results from this survey.

Phase 1 Results

The objectives of the first meeting were to develop a shared vision for the intervention. Community partners shared that they responded well to information that came from trusted sources and addressed their specific concerns about the vaccine. The community partners also stressed the importance of targeting both youth and caregivers because many caregivers involve their child in the decision about whether to get vaccinated. Finally, youth and adult community partners shared how a dialogue with a trusted health care provider positively influenced their decision to get the vaccine. Feedback from community partners was distilled into themes (Table 1). Ten (100%) community partners attended and six (54.5%) completed the community engagement survey following the first meeting. The average score was 4.90 (standard deviation [SD] = 1.11), indicating good levels of engagement. In open-ended responses, community partners said that they wanted to hear more from the youth leaders. In response to this, during subsequent meetings, facilitators purposefully elicited input from youth leaders.

Table 1. Themes from Community Partner Meetings

	Community-Tailored Handouts & Flyers	Videos Featuring Local Families	Family-Centered Language to Offer Vaccines	Communication Skills Training for Providers	Community Health Workers
Target youth and parents	X	X		X	X
Feature local families and providers	X	X			
Tailor to community concerns and motivators	X	X	X	X	X
Leverage pediatric clinics	X	X	X	X	X

Note: “X” indicates the theme(s) that each strategy addresses.

During meetings 2 and 3, we gathered feedback on pre-existing informational handouts and videos developed by other hospitals, public health departments, and outreach organizations. The community partners noted that, although they liked the content of the informational handouts and videos, it was important to employ local families and physicians to deliver the messages. The community partners also felt that the informational handouts could be tailored to local communities’ questions and concerns. Finally, the community partners suggested that handouts and posters be less wordy and use appealing imagery featuring Black and Hispanic youth. Ten (91%) community partners attended the second meeting, and nine (75%) community partners attended the third meeting. Three partners (27.3%) completed the community engagement survey after the third meeting; the average score on the community engagement survey was 4.93 (SD = 1.22), indicating that levels of partner engagement among respondents remained high.

Based on community partner input, we developed a multicomponent intervention. Each component used a different modality to address community beliefs and motivators identified by community partners, leverage trusted messengers like primary care providers and local families, and encourage dialogue with health care providers in the primary care setting, as recommended by our community partners (Table 1). These components included (1) community-tailored educational handouts and motivational posters for distribution at primary care clinics; (2) videos featuring local youth, families, and health care providers to address misinformation about COVID-19 vaccines and motivate youth to be vaccinated, which will be distributed by primary care clinics; (3) family-centered language to routinely offer the COVID-19 vaccine to improve access and encourage dialogue about the COVID-19 vaccine in the primary care setting; (4) training primary care providers on family-centered communication skills and motivational interviewing; and (5) employing community health workers to conduct outreach to patients and families about the COVID-19 vaccine within the primary care setting using other intervention components (e.g., sharing handouts and videos).

Intervention components were developed in English and then translated to Spanish using a third-party translation company. During meetings 4-8 (average attendance 54.8%), we planned how to create the intervention components (e.g., how to engage local youth to participate in video and photo shoots), solicited feedback about the intervention components developed by our team (for example, community partners asked us to incorporate more color and photos of youth on handouts), and discussed how to broadly disseminate the intervention to the community. Ratings of partner engagement slightly declined across meetings 4-8 (mean = 4.24; SD = 0.64). In open-ended responses, partners expressed that they wanted youth partners to participate more. To address this, research team leaders made efforts to elicit more feedback from youth during meetings.

Phase 2: Evaluating Acceptability and Intervention Refinement

Phase 2 Methods

In Phase 2 (Figure 1; steps 5 and 6), we gathered perspectives from Black and Hispanic youth and caregivers on the acceptability of the intervention components via crowdsourcing, a form of online problem-solving with individuals with relevant experience and perspectives.^{31,32} We then revised components based on their feedback.

Recruitment

Potentially eligible caregivers and youth were identified by reviewing the electronic health records of all youth who had received care at one of the four participating primary care clinics in the past year. Caregivers of youth between 5 and 17 years old and youth between 12 and 17 years old were eligible to participate if (1) they identified as non-Hispanic Black or Hispanic, (2) they were proficient in English or Spanish, and (3) the youth, or the caregiver's child, had not received any dose of the COVID-19 vaccine. Youth and their caregivers were encouraged to participate as a dyad, but they could participate individually. Purposive sampling was used to obtain a diverse sample regarding race, ethnicity, and primary language.

A total of 362 families (177 Black and 185 Hispanic) were approached by phone call, text, and/or email, of which caregivers and/or youth from 36 families enrolled (27 caregivers, 19 youth). Caregivers and youth completed an e-consent process with a trained research coordinator.

Data Collection

Once enrolled, caregivers and youth were emailed instructions to create a de-identified account on Yammer.com, a secure, online social network platform for qualitative data collection, and then assigned to one of four private groups (Caregiver/English, Youth/English, Caregiver/Spanish, Youth/Spanish) so they could only see posts and responses for their group.

Between November 2021 and January 2022, we posted 10 study questions within each group (Table 2). Follow-up questions were developed, as needed, based on participant responses. No data were collected for post 1, which was designed to engage participants by allowing them to share why they joined the study. In post 2, youth and caregivers voted for a slogan to be featured in all content. In posts 3-10, two forms of data were collected from youth and caregivers. First, participants indicated if an intervention component was acceptable by survey responses (yes/no). Second, participants provided open-ended responses to explain why they thought the component

was acceptable or not. Those in the Caregiver/Spanish group were provided all information and questions in Spanish and those in the Youth/Spanish group were provided all information and questions in Spanish and English. Youth and caregivers were compensated for each response they provided.

Table 2. Overview of Crowdsourcing Posts

1	Introduction & rapport building (why did you join this group?)
2	Choosing a slogan to motivate youth to get the COVID-19 vaccine
3	Educational handout addressing community myths about the COVID-19 vaccine
4	Family-centered language for offering the vaccine at primary care visits
5	Communication strategies for primary care providers
6	Community health care workers conducting outreach at primary care clinics
7	Motivational Flyers
8	Video featuring local Black youth or Hispanic families – motivation to get the vaccine
9	Video featuring local Black youth or Hispanic families – addressing concerns about vaccine safety
10	Videos to address community-specific concerns w/vaccine
11	Addressing mistrust w/medical system (youth & Black caregivers only)
12	Addressing questions about COVID-19 vaccine (Spanish-speaking caregivers only)

Note: For posts 7 and 10 we posted follow-up posts for specific groups based on participants' responses to the original posts.

Data Analysis

We excluded seven caregivers and four youth from analysis (two caregivers withdrew prior to the crowdsourcing procedures; five caregivers and one youth did not sign up for Yammer; three youth did not provide at least one response to posts 2-10), resulting in a final patient-partner group of 20 caregivers and 15 youth (Table 3). A mixed-methods approach was used to analyze the data. First, we calculated the proportion of respondents that found each intervention component acceptable, neutral/mixed, and unacceptable. An a-priori criteria of 80% of participants rating an intervention component as acceptable was established. Components where fewer than 80% of participants rated as acceptable would be revised based on open-ended responses. Next, we mixed quantitative and qualitative data through the process of *building* in which qualitative data were used to better understand participants' acceptability ratings.^{30,33} A two-person team (PTE, CT) analyzed the qualitative data to understand what caregivers and youth did and did not like about specific intervention components.

Table 3. Demographics and Descriptives

	Caregivers (n = 20)	Adolescent (n = 15)
	N (%)	N (%)
Sex		
Female	17 (85.0)	9 (60.0)
Male	3 (15.0)	6 (40.0)
Race/ethnicity		
Non-Hispanic Black	12 (60.0)	11 (73.3)

Hispanic (any race)	8 (40.0)	4 (26.7)
Relation to target child		
Biological mother	17 (85.0)	---
Biological father	3 (15.0)	---
Primary spoken language		
English	14 (70.0)	13 (86.7)
Spanish	6 (30.0)	1 (6.7)
Both	---	1 (6.7)
Insurance type ^a		
Public	14 (70.0)	4 (50.0)
Private	6 (30.0)	4 (50.0)
Intend to get COVID-19 vaccine? ^a		
Yes	6 (30.0)	1 (12.5)
No	3 (15.0)	1 (12.5)
Maybe	11 (55.0)	6 (75.0)
	Mean (SD), range	Mean (SD), range
Age (years)	40.4 (7.3), 31.0-64.0	13.9 (1.6), 12-17
Target child age (years)	10.8 (3.6), 5.0-17.0	---

Note: ^aCaregiver responses report on all adolescents except for the eight youth who participated without their caregivers.

Phase 2 Results

First, we presented the results of the polls on preferred slogan (Table 4). A majority of Black caregivers (67%), Black youth (67%), and Hispanic youth (100%) preferred a slogan that focused on how the COVID-19 vaccine would let you get back to doing things you enjoy. Most Hispanic caregivers (67%) preferred a slogan that focused on how getting the COVID-19 vaccine would protect your family and community. After consultation with our community partners, we decided that English materials would include the slogan “Get back to the moments you missed,” whereas Spanish materials would include the slogan “Protect yourself, your family, your community” since most Hispanic youth were bilingual.

Table 4. Stakeholder Voting for Slogans

	NHB Caregivers (n = 12)	NHB Youth (n = 9)	Hispanic Caregivers (n = 6)	Hispanic Youth (n = 6)
Get back to the things you enjoy	8% / ---	0%	17%	---
Get back to the people and	25% / 67% ^a	67%	0%	100%

moments you missed

Get back to the people and things you love	25% / ---	11%	0%	---
Protect yourself, your family, your community	25% / 33% ^a	22%	67%	0%
For you friends, your family, your community	17% / ---	17%	17%	---

Note: ^aResults from second round of voting.

Prototypes of six distinct intervention components were provided to participants and five were rated as acceptable by $\geq 80\%$ of youth and caregivers and therefore did not require refinement (Table 5). Approximately 85% of participants rated the community-tailored handout as acceptable. Qualitative data revealed that participants felt the handout answered important questions and was easy to read. Some caregivers also noted that it could facilitate conversations about the vaccine with their primary care provider. One Black caregiver shared, “*The fact sheet offers up front information which could open up questions that the families may feel more comfortable asking a health care professional after reading.*” One Black youth expressed concern about serious side effects from the vaccine, so a section was added about myocarditis risk.

Table 5. Acceptability Ratings for Intervention Components

Component	Acceptable % (n)	Neutral/Mixed % (n)	Unacceptable % (n)
Community-tailored handouts (n = 27)	85.2 (23)	14.8 (2)	0.0 (0)
Family-centered language to offer vaccines (n = 30)	56.7 (17)	30.0 (9)	13.3 (4)
Provider family-centered communication strategies (n = 33)	93.9 (31)	6.1 (2)	0.0 (0)
Community health workers (n = 32)	96.9 (31)	0.0 (0)	3.1 (1)
Community-tailored flyers (n = 32)	87.5 (28)	6.3 (2)	6.3 (2)
Videos^a	90.2%	8.4	1.4
“Do I need the COVID-19 vaccine if I’m young and healthy?” (n = 25)	96.0 (24)	4.0 (1)	0.0 (0)

“Why I got the vaccine.” (n = 28)	89.3 (25)	3.6 (1)	7.1 (2)
“How can I trust that the COVID-19 vaccine is safe?” (n = 18) ^b	100 (18)	0.0 (0)	0.0 (0)
“How we feel after getting the COVID-19 vaccine?” (n = 7) ^c	85.7 (6)	14.3 (1)	0.0 (0)
“Rapid development of vaccine” & “vaccine & fertility” (n = 5) ^d	80.0 (4)	20.0 (1)	0.0 (0)

Notes: ^aAverage acceptability ratings across all videos; ^bOnly shown to Black youth and caregivers; ^cOnly shown to Hispanic youth and caregivers; ^dTwo videos shown only to Hispanic caregivers.

Around half (56%) of participants rated family-centered language to offer the vaccine at the time of a clinic visit as acceptable. Caregivers and youth felt that it was an opportunity to talk to their health care provider and learn more about the vaccine; however, many disapproved of the original wording, which suggested that the child was *due* for the COVID-19 vaccine. One Black caregiver explained, “*The approach is wrong because the COVID shot isn’t something my children get. Perhaps more on the lines like the shot is available for your child today are you interested in them getting it or do [you] have any questions or concerns that I can answer.*” Caregivers also shared that, ultimately, families should be the ones deciding whether to get the vaccine. To address this, we changed the wording to ask families about their readiness to *talk to their provider* about the COVID-19 vaccine.

Almost all participants rated primary care providers using family-centered communication skills (93.9%) and community health workers providing education and counseling before visits (96.9%) as acceptable interventions that would help families feel more comfortable with making a decision about the COVID-19 vaccine. For example, one Hispanic caregiver noted “*I think [the communication skills do] help, and even more so if the doctors speak to us more clearly about the importance of the vaccine, one would be calmer to make the best decision.*” Regarding receiving counseling from community health workers, one Black caregiver shared, “*It prepares both sides, saves time & causes no pressure on the parent. Speaking ahead of time [with a community health worker] may help with making an honest, informed decision about whether or not to vaccinate.*”

Over 80% of participants rated the community-tailored motivational posters as acceptable. For example, one Hispanic teen shared that the posters highlighted the benefits of getting vaccinated, such as, “*reuniting with family they haven’t been in contact with since the pandemic started.*” We incorporated families’ suggestions on ways to improve the poster, such as adding a website link, into the final design.

Over 80% of participants rated the videos featuring local youth, families, and health care providers as acceptable. Participants felt that youth and families featured in the videos had relatable reasons for choosing to get vaccinated. As one Black teen shared, “*I say it’s helpful*

because they all got up there and said how they felt about the situation and a lot of them did it for the people they love.” Youth and caregivers also appreciated that the videos answered common and important questions in a way that normalized their own concerns. For example, one Black caregiver shared, *“This is by far the most informative, honest video so far! The facts and fears were talked about in a way that wasn't demeaning.”* Although Hispanic caregivers found the original videos to be acceptable, they wanted more information about the vaccine itself in the videos. Therefore, we asked the Hispanic caregivers for feedback on two additional videos that featured a local pediatrician of Hispanic background answering questions about the COVID-19 vaccine. Most Hispanic caregivers (80%) rated these videos as acceptable.

Discussion

We found that a culturally- and locally-tailored intervention that promotes dialogue with trusted messengers and shared decision-making is a preferred way to promote COVID-19 vaccine uptake among historically marginalized communities. We successfully engaged community partners to identify barriers and facilitators to COVID-19 vaccine uptake and develop intervention components to address these. Results from the community engagement survey indicated high levels of engagement from our community partners throughout the development phase. Findings from the crowdsourcing phase of the study indicated that the intervention components were highly acceptable to our patient partners.

The format and content of our multicomponent intervention is consistent with a systematic review on effective strategies to address vaccine hesitancy.¹² In practice, the components of our cocreated intervention could be implemented independently or in concert. For example, it may be that videos or handouts are effective for families who have isolated concerns, but more hesitant families may benefit from dialogue with a trusted source like a pediatrician or community health worker outreach. However, the components are also complementary and cohesive in that they utilized shared messaging (e.g., community-tailored slogans and addressing community myths), with several components also promoting shared decision-making with regard to getting the COVID-19 vaccine. This included training primary care providers and community health workers to use motivational interviewing, an approach that has demonstrated efficacy in reducing vaccine hesitancy and promoting vaccine uptake for other vaccines.^{16,17,34}

This study highlights the importance of engaging relevant partners when developing interventions, particularly when these interventions aim to address health disparities. Although our intervention was grounded in the scientific literature on vaccine hesitancy and supported by partners within the health care system, our community and patient partners provided invaluable insights on *how* to tailor and implement the intervention. Their recommendations to feature local youth and normalize concerns about the vaccine, insights into what concerns and motivators were relevant to the community, and emphasis on having dialogues with trusted messengers (e.g., pediatricians, community health workers) enhanced the acceptability of our intervention. While this process of working with multiple partner groups in an iterative process can be time-consuming, it is important to ensuring that an intervention is ultimately successful. Our process of engaging community and patient partners can also be generalized to other health equity issues. Of note, we engaged partners through advisory and focus groups, and therefore partners did not need to have formal research experience or training. Although this was an effective method for engaging stakeholders, future work may benefit from including partners as more formal members of the research team.³⁵ Regardless of the level of involvement, it is also important that

partner engagement is bidirectional. Furthermore, effective partnerships should be ongoing, highlighting the need for community engagement infrastructure within health care systems.

This study has multiple strengths, including the engagement of a large and diverse group of partners, following recommendations from the Promising Practices Guide,²⁴ and use of rigorous mixed methods when refining the intervention. However, the following limitations should be considered when interpreting results of this study. The proportion of community partners completing the community engagement survey declined over time and may have affected how we engaged community partners. However, attendance rates were higher ($\geq 75\%$) during the initial co-development process. The sample was limited to Black and Hispanic families or community leaders in Delaware, so results may not generalize to other communities. However, the very nature of this work is to ensure that interventions are tailored to specific communities and therefore we encourage others to use this same approach when developing and refining interventions. Due to the dynamic nature of the COVID-19 pandemic, interventions needed ongoing refinement to ensure they remained relevant. Engaging community partners even after an intervention is developed is helpful in remaining responsive despite evolving circumstances. Finally, the formative nature of this study precludes any conclusions about the efficacy of the intervention. We plan to test this intervention in a future pilot randomized controlled trial.

Public Health Implications

The current study highlights how engaging community, youth, and caregiver partners can improve the quality and acceptability of health equity interventions to promote vaccine uptake. Utilizing empirically-supported practices facilitated a productive partnership and codesign process and allowed the research team to be responsive to community, youth, and caregiver partner feedback. Input from partners suggested that strategies that addressed community concerns, featured local community members and trusted messengers, and promoted shared decision-making were most acceptable. This approach can be applied to enhance other interventions to reduce disparities in vaccine uptake.

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