



Caring for community members during the COVID-19 pandemic: results of a statewide survey

Tess Jewell¹ · Kate H. Gillespie² · Nicholas B. Schmuhi³ · Sharon Gilbert⁴ · Bria Grant⁵ · Lakeeta Watts⁶ · Deborah B. Ehrental⁷

Received: 6 March 2023 / Accepted: 12 May 2023

© The Author(s), under exclusive licence to Springer-Verlag GmbH Germany, part of Springer Nature 2023

Abstract

Aim Community health workers (CHWs) and home visitors (HVs) are members of the public health workforce who are uniquely poised to support vulnerable populations during the COVID-19 pandemic. In this study, we assess the experiences of CHWs and HVs in Wisconsin during the early stages of the COVID-19 pandemic to learn about their experiences related to mitigation strategies and vaccination efforts.

Subject and methods Working closely with community partners, we recruited CHWs and HVs via email to complete an online survey between June 24 and August 10, 2021. Participants were eligible if they worked at any time since March 25, 2020, when the Safer at Home Order was put into place. The survey asked CHWs and HVs about their experiences during the COVID-19 pandemic and vaccination efforts.

Results Eligible respondents included 48 HVs and 26 CHWs. Most CHWs (96%) and HVs (85%) reported discussing the COVID-19 vaccine with clients, and 46% of HVs and 85% of CHWs said they planned to encourage their clients to vaccinate themselves against COVID-19. We found that many CHWs and HVs identified the COVID-19 pandemic as a threat to the health of the US population, and many reported that they thought mitigation strategies were effective at keeping people safe from COVID-19. There was inconsistency in regard to respondents plans to encourage their clients to receive vaccination for COVID-19.

Conclusion Future study, training, and support for CHWs and HVs should focus on facilitating vaccination efforts and other emerging public health interventions.

Keywords Community health worker · Home visitor · COVID-19 · Vaccine · Pandemic

Introduction

Community health workers (CHWs) and home visitors (HVs) are integral members of the health workforce who provide support and services to promote the health and well-being of communities. CHWs include people working in diverse roles such as promotor(a) de salud, community health representative, community health advisor, community health advocate, and doula, among other titles. They work in community and healthcare settings and provide a range of services to their clients including interpretation and translation, culturally appropriate health education and information, informal counseling and guidance on health behaviors, advocacy for individuals and communities, and direct services (e.g., first aid and blood pressure screening), and assist their clients in accessing formal healthcare (National Heart, Lung, and Blood Institute 2014). CHWs are trusted

✉ Kate H. Gillespie
khgillespie@wisc.edu

¹ University of Wisconsin School of Medicine and Public Health, Madison, WI, USA

² University of Wisconsin School of Nursing, WI, Madison, USA

³ University of Wisconsin Population Health Institute, Madison, WI, USA

⁴ Wisconsin Department of Health Services, WI, Madison, USA

⁵ UniteWI, Milwaukee, WI, USA

⁶ CLC, CHW, Doula, Milwaukee, WI, USA

⁷ Social Science Research Institute (SSRI), The Pennsylvania State University, University Park, PA, USA

community members who often share lived experiences with their clients and have expertise in navigating systems of care (Peretz et al. 2020). Their positionality is critical for gaining trust, addressing social determinants of health, and supporting vulnerable populations (Malcarney et al. 2017). People work in CHW roles across the globe, and CHW programs have led to health benefits in low, middle, and high income countries, including the United States (Perry et al. 2014).

Early childhood HVs provide designated support for families and expectant parents using an evidence-based model (such as Parents as Teachers, Early Head Start, Healthy Families America, or Nurse-Family Partnership). They work with young families to provide education, support early parenting, and promote health and well-being. The home visiting models adhere to national criteria and measures. The HV workforce includes professionals who hold titles such as registered nurse, social worker, or early childhood specialist. HVs provide a variety of services to their clients in the community, including case management, screening for risk factor and needs, family support and counseling, and training in caregiver skills. HVs meet regularly with their clients to provide education, resources, and support (Sandstorm 2019).

Both CHWs and HVs have vital roles within the public health system, utilizing their relationships with clients and ability to connect communities to other stakeholders in healthcare and public health. The ability to foster relationships and traverse organizational boundaries are both essential to taking a systems based approach to public health (Leischow and Milstein 2006). Professionals working in these roles could be instrumental in shifting healthcare systems to utilize a more patient-centered approach and aid in implementing healthcare system changes (Balcazar et al. 2011).

The novel coronavirus disease 2019 (COVID-19, from infection with severe acute respiratory syndrome coronavirus 2 [SARS-CoV-2]) pandemic has exposed deficits in the healthcare and public health systems in the United States (Blumenthal et al. 2020). The COVID-19 pandemic has disproportionately impacted communities affected by poverty, racism, and language barriers (Peretz et al. 2020), which includes newest families from immigrant communities (Kiestler and Vasquez-Merino 2021). In addition, rural communities across the United States are more vulnerable to the deleterious effects of COVID-19 (Dobis and McGranahan 2021) and have lower rates of COVID-19 vaccination (Murthy et al. 2021). Notably, over half of counties in Wisconsin are rural (Wisconsin Department of Health Services 2020). Additionally, in Wisconsin, Black, Indigenous, and people of color (BIPOC) have been disproportionately impacted by COVID-19 and have lower vaccination rates (Wisconsin Department of Health Services 2022), reflecting pre-existing health disparities. Because of their knowledge and roles in the community, CHWs and HVs are uniquely poised to support those disproportionately impacted by COVID-19.

CHWs and HVs can assist in navigating rapidly changing information, alleviate fear and stigma related to COVID-19, and further support people in accessing the care and resources they need (Peretz et al. 2020; Marshall et al. 2020).

A qualitative study of the community health workforce across the United States serving as NACHW state ambassadors found that these professionals were working on the frontlines as essential workers (Mayfield-Johnson et al. 2020). According to a survey of the experiences of CHWs in Texas during the COVID-19 pandemic, 85% of respondents reported that COVID-19-related restrictions at the state or local level changed how they performed their work related duties. Some respondents reported changes in their roles and the skills they utilized in their position (St. John et al. 2021). Another study found that Black birthworkers in North America, who included doulas and CHWs among others, provided an essential source of information and support for pregnant people, especially those navigating hospital birth during the COVID-19 pandemic (Oparah et al. 2021).

In addition, home visiting programs rapidly adapted their models and service delivery in the onset of the COVID-19 pandemic (Williams et al. 2021). Multiple studies of home visiting programs around the United States have demonstrated how HVs were able to continue to serve families throughout the COVID-19 pandemic (Rybińska et al. 2022; Marshall et al. 2020; Traube et al. 2022; Roben et al. 2022), with a couple studies finding a slight decline in program participation (Rybińska et al. 2022; Mersky et al. 2021).

Because CHWs and HVs are often trusted support persons in the community, they are in unique positions to support their clients in sensitive decisions such as COVID-19 vaccination [World Health Organization and United Nations Children's Fund (UNICEF) 2021; HRSA Maternal and Child Health 2022]. It is therefore essential to understand the perceptions of CHWs and HVs regarding COVID-19 vaccines and their experiences discussing these vaccines with their clients. Despite the demonstrated importance of CHWs and HVs in their roles, there remain limited data regarding their experiences in the United States during the COVID-19 pandemic related to mitigation strategies and vaccination efforts. This study used a statewide survey to assess the experiences of CHWs and HVs in Wisconsin during the first year of the COVID-19 pandemic related to mitigation and vaccination efforts.

Methods

Subject and setting

Between June 24, 2021, and August 10, 2021, we conducted an online survey of people working in CHW and HV roles in Wisconsin at any time since March 25, 2020, when the Safer

at Home Order (Emergency Order #12) was put in place by the Wisconsin governor (Evers and Palm 2020). The study sample included CHWs and HVs from two networks with recognized statewide influence over the two workforces, and included those working as *promotores de salud*, community health representatives, home visitors, prenatal care coordinators, and doulas. The University of Wisconsin-Madison Health Sciences Institutional Review Board determined this study to be exempt from review.

One of the organizations that our participants were recruited from, Wisconsin's Family Foundations Home Visiting (FFHV) program, employs HVs and aims to promote the healthy physical development of a child through home-based support. They provide support through partnering with families to identify specific needs related to child development, parenting, and family functioning, which they accomplish using four of the federally approved evidence-based program models (Early Head Start-Home Based, Healthy Families America, Parents as Teachers, and Nurse-Family Partnership) [Wisconsin Department of Children and Families (n.d.)].

The second organization, Wisconsin Community Health Worker Network (WICHWN), is a collaboration of multiple organizations that serves to support CHWs across Wisconsin. This network aims to foster relationships between CHWs and the Wisconsin public health workforce; increase community-clinical linkages among CHWs, community-based organizations, and health systems; and support the sustainability of the CHW workforce [Wisconsin Community Health Worker Network (n.d.)].

Survey instrument

We developed a questionnaire in collaboration with the University of Wisconsin Survey Center (UWSC), FFHV program, and WICHWN. The questionnaire was administered online using Qualtrics (2021) survey software. The first two questions screened participants to ensure that they met eligibility requirements. We adapted survey items from previously fielded questionnaires [St. John et al. 2021; Division of Primary Care and Health Access, Bureau of Family and Community Health, Center for Community Health, Massachusetts Department of Public Health 2005; Minnesota Department of Health (n.d.); Survey of the Health of Wisconsin (n.d.); Altarum (n.d.); Funk and Tyson 2021; North Carolina Department of Health and Human Services 2017; Callaghan et al. 2021; Dror et al. 2020; MedScape 2021; KFF 2021] and added several novel items based on literature review and field experiences of our partner organizations.

The survey consisted of 57 questions, and not every respondent was provided with each question due to branching logic based on their previous responses. Response options to questions included Likert scales, lists for which

respondents could select only one option, and lists for which respondents could select all options that applied. Some questions focused on respondents' perspectives on the COVID-19 pandemic overall and risk mitigation strategies. For example, when asked how effective they thought various mitigation strategies were at protecting people from COVID-19, respondents could select "not at all effective," "a little effective," "somewhat effective," "very effective," or "extremely effective." The mitigation strategies assessed here included wearing a face mask; washing hands; avoiding public spaces, gatherings, and crowds; social distancing; and isolating if symptoms are present. Respondents were also asked how much of a threat they perceived the coronavirus outbreak to be for the health of the US population as a whole, for which they could respond "no threat at all," "a minor threat," "a moderate threat," "a major threat," or "an extreme threat."

Additional questions evaluated respondents' experiences and perspectives on vaccines for COVID-19 in their personal and professional lives. Respondents were asked how much confidence they had that the COVID-19 vaccines made by Pfizer/BioNTech, Moderna, and Johnson & Johnson were safe and effective. For these questions respondents could select "no confidence at all," "a little confidence," "some confidence," "quite a bit of confidence," or "a great deal of confidence." Respondents were asked if they had received a vaccine to prevent COVID-19, with response options "yes" and "no." If a respondent selected "no," indicating that they had not received a vaccine to prevent COVID-19, they were asked about their thoughts regarding whether they would get a vaccine in the future, with response options including "definitely not get a vaccine," "probably not get a vaccine," "probably get a vaccine," "definitely get a vaccine," and "undecided."

When asked if they were planning to encourage their clients to get a vaccine for COVID-19, respondents could select "yes," "no," or "unsure." Those who selected "no" or "unsure" were prompted with another question asking them why they responded this way, with the answer options in a checklist with the option to select all that applied. Examples of items on this list included "It is outside of my scope of work," "I have not received the appropriate training to do this," and "I do not want my client to think I am judging their decisions," among multiple other options.

Survey distribution

The FFHV program recruited participants by asking members to provide their email address if they were willing to receive the survey invitation. Of 200 HVs in the FFHV program, 122 agreed to participate by sharing their email addresses. HVs received a survey URL via email with a

unique identifier allowing the UWSC to track participation and send up to four reminders to non-responders.

WICHWN recruited participants via network-wide emails to its LISTSERV, which included 270 members. This methodology, agreed upon by the WICHWN Board of Directors, did not allow us to embed unique survey links to each participant; thus, we sent a total of four emails to this group, including one invitation containing a common URL and three reminders.

Upon completion, the survey directed respondents to a separate questionnaire where they could provide their name and mailing address to receive \$10 by mail.

Data collection

Of the 122 prospective participants invited through the FFHV program, 48 were screened as eligible and completed the survey. One additional respondent was screened as ineligible and was therefore not directed to the full survey. The response rate for the FFHV sample was calculated by multiplying the response rate of the number of people in the network who were willing to provide their email for this project (122/200, or 61%), by the response rate of the people in this sample that we sent the survey to (48/122, or 39.3%), therefore yielding an overall eligible response rate of 24%.

Of the 270-member WICHWN email list, 26 respondents were screened in as eligible and subsequently completed the survey. Three additional respondents were screened out as ineligible and were not directed into the full survey. The approximate eligible response rate from this part of the sample was 9.6%. Because of the use of an open link to the survey in our recruitment of this part of the sample, we could not calculate an exact response rate.

Statistical analysis

Descriptive statistics were calculated using RStudio (RStudio, PBC 2022) and Microsoft Excel (Microsoft Corporation 2021). Fisher's exact test was used, using $\alpha < 0.05$ to indicate significance. Qualitative data from the open-ended responses were analyzed for common themes using Microsoft Excel (Microsoft Corporation 2021).

Results

The majority of the respondents in the HV sample indicated that they worked as an early childhood home visitor (75%), and the majority of the CHW sample identified as a community health worker (92%). Other commonly reported job titles included promotor(a) de salud (2% HV and 12% CHW samples), community health representative (8% HV and 23% CHW samples), and prenatal care

coordinator (27% HV and 12% CHW samples). The mean age of the HV sample was 41 years (range 23–64). The mean age of the CHW sample was 45 years (range 21–64). One hundred percent of the HV sample and 81% of the CHW sample identified as women; 79% of the HV sample and 46% of the CHW sample identified as White; 90% of the HV sample and 46% of the CHW sample reported a bachelor's degree, four-year college degree, or higher as their highest level of education.

Ninety-eight percent of the HV sample and 88% of the CHW sample indicated that they worked for an organization. Eighty-three percent of the HV sample and 73% of the CHW sample reported that they worked one job, with 17% of the HV sample and 27% of the CHW sample reporting that they worked two or more jobs. We received responses from people who worked in 37 of the 72 counties across the state of Wisconsin. The majority (85%) of both the HV and CHW samples reported that the demographics of the populations they worked with had not changed since the onset of the pandemic.

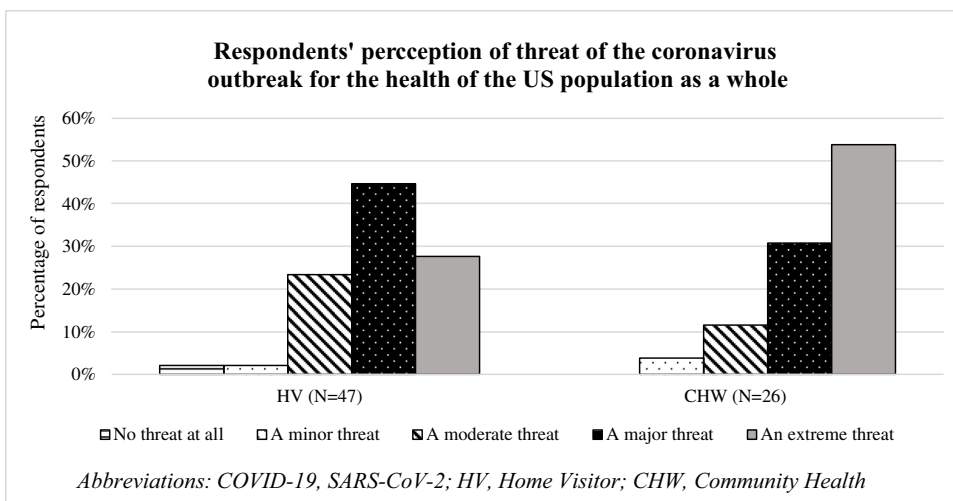
Majorities of both the HV (71%) and the CHW (85%) samples responded that they perceived the COVID-19 outbreak to be a "major" or "extreme" threat for the health of the US population as a whole (Fig. 1). There was no significant difference in these responses between samples.

Regarding the perceived effectiveness of mitigation strategies (Fig. 2), many HV and CHW respondents reported that the strategies were "very" or "extremely" effective. Responses between samples were significantly different only for the strategy "wearing a face mask" ($P < 0.05$), where 0% of the HV and 4% of the CHW samples selected "not at all effective," 10% HV and 0% CHW selected "a little effective," 21% HV and 15% CHW selected "somewhat effective," 38% HV and 15% CHW selected "very effective," and 31% HV and 65% CHW selected "extremely effective."

The majority of respondents in both samples reported at least some confidence that the COVID-19 vaccines approved for use in the United States were safe: Pfizer/BioNTech (77% HV, 92% CHW); Moderna (81% HV, 92% CHW); and Johnson & Johnson (58% HV, 65% CHW). Similarly, the majority reported that they had at least some confidence that the COVID-19 vaccines approved for use in the United States were effective: Pfizer/BioNTech (73% HV, 96% CHW); Moderna (79% HV, 96% CHW); and Johnson & Johnson (65% HV, 73% CHW). At the time of the survey, the majority of the respondents in both samples had received a vaccine to prevent COVID-19 (Fig. 3). There was no significant difference between the samples regarding vaccination and vaccination intention status.

The majority of respondents in both samples reported that their organization offered training on at least one topic related to COVID-19. Table 1 describes the COVID-19-related training participants were offered.

Fig. 1 In total, 71% of HVs and 85% of CHWs responded that they perceived the COVID-19 outbreak to be a “major” or “extreme” threat” for the health of the US population as a whole. There was no significant difference in these responses between samples



The majority of both samples, 85% of the HV sample and 96% of the CHW sample, reported that they had discussed the COVID-19 vaccine with any of their clients. There was a trend for more respondents in the CHW sample to report that they planned to encourage their clients to get the COVID-19 vaccine (Fig. 4). There was a significant difference between the HV and CHW sample responses regarding whether they were, were not, or were unsure about encouraging their clients to be vaccinated for COVID-19 ($P < 0.01$). There was no significant relationship between the respondent’s vaccination status and their plan to encourage their clients to receive the vaccine in either sample. Additionally, there was no significant relationship between whether the respondent

had received training in COVID-19 vaccines and their plan to encourage clients to receive the vaccine in either sample. Figure 5 describes the reasons participants identified for not discussing the vaccines with clients, or their hesitancy to do so.

There was a significant association between responding that the COVID-19 outbreak was a “major” or “extreme” threat for the health of the US population as a whole and plans to encourage clients to get the COVID-19 vaccine among the HV sample ($P < 0.01$). Among the respondents in the HV sample who said that they thought the COVID-19 outbreak was a “major” or “extreme” threat to the health of the US population, 59% said they planned to encourage their

Fig. 2 Participants were asked about their views on the effectiveness of mitigation strategies in keeping people safe from COVID-19

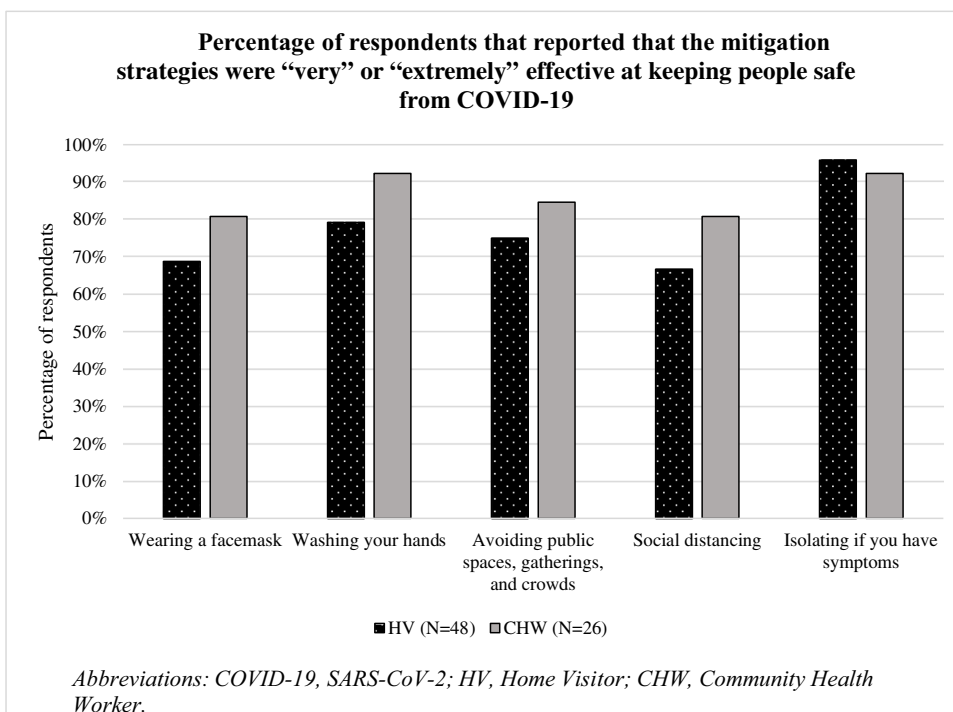


Fig. 3 Participants were asked whether they had received a vaccine for COVID-19, and if they had not, were asked whether they were planning to get vaccinated. Abbreviations: COVID-19, coronavirus disease 2019 from infection with SARS-CoV-2; HV, home visitor; CHW, community health worker

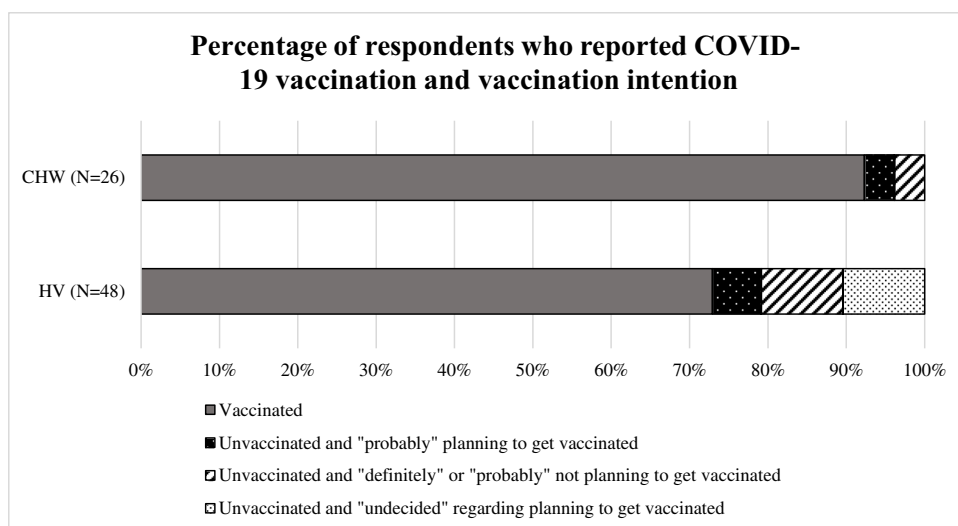


Table 1 Training topics related to COVID-19 that respondents reported being offered by their organization[†]

Training topic	HV (N=48)	CHW (N=26)
Assessment of needs	19 (40%)	11 (42%)
Education**	20 (42%)	20 (77%)
Protective behaviors	23 (48%)	15 (58%)
COVID-19-specific, such as what it is and who is at risk	28 (58%)	20 (77%)
Public health system	15 (31%)	9 (35%)
COVID-19 vaccines*	27 (56%)	21 (81%)
Disproportionate impacts of COVID-19 on ethnic and racial groups	18 (38%)	12 (46%)
None of the above	12 (25%)	2 (8%)

* $P < 0.05$, ** $P < 0.01$

[†]Percentages do not add to 100% because respondents were able to select more than one training topic

Abbreviations: COVID-19, coronavirus disease 2019 from infection with SARS-CoV-2; HV, home visitor; CHW, community health worker

clients to receive the COVID-19 vaccine, while 41% said they did not plan to do so or were “unsure.” Comparatively, among HVs who said that they thought the COVID-19 outbreak was a “moderate” or “minor” threat or “no threat at all,” only 15% planned to encourage clients to get the vaccine, while 85% did not plan to do so or were “unsure.” There was no significant association between responding that the COVID-19 outbreak was a “major” or “extreme” threat for the health of the US population as a whole and plans to encourage clients to get the COVID-19 vaccine among the CHW sample. Among the respondents in the CHW sample who said that they thought the COVID-19 outbreak was a “major” or “extreme” threat to the health

of the US population, 82% said they planned to encourage their clients to receive the COVID-19 vaccine, while 18% said they did not plan to do so or were “unsure.” Comparatively, among respondents in the CHW sample who said that they thought the COVID-19 outbreak was a “moderate” or “minor” threat or “no threat at all,” 100% planned to encourage clients to get the vaccine.

Discussion

The COVID-19 pandemic presented a major public health emergency in Wisconsin and across the world. CHWs and HVs are in a unique position from a public health perspective, with strong relationships with clients in the community to provide support and guidance through public health crises such as COVID-19. Our findings demonstrate the commitment of CHWs and HVs to support their clients and retain services during the initial stages of the COVID-19 pandemic. Our study found that CHWs and HVs received variable training on COVID-19-specific topics, and some did not plan to encourage their clients to receive vaccination for COVID-19. A stronger connection to the public health system could have provided continuous updates on essential information related to the pandemic and thus allow the strong connections of the CHWs and HVs to vulnerable populations to serve as a bridge for a more effective public health response.

The CHW and HV workforces act as bridges between healthcare and the public health workforce. Our study revealed how CHWs and HVs have the opportunity to discuss COVID-19 vaccination with community members and encourage them to get vaccinated. We found more variance in attitudes about the severity of the COVID-19 threat to the US population among HVs than among CHWs. Among

Fig. 4 There was a significant difference between the HV and CHW samples responses regarding whether they were, were not, or were unsure about encouraging their clients to be vaccinated for COVID-19 ($P < 0.01$). Abbreviations: COVID-19, coronavirus disease 2019 from infection with SARS-CoV-2; HV, home visitor; CHW, community health worker

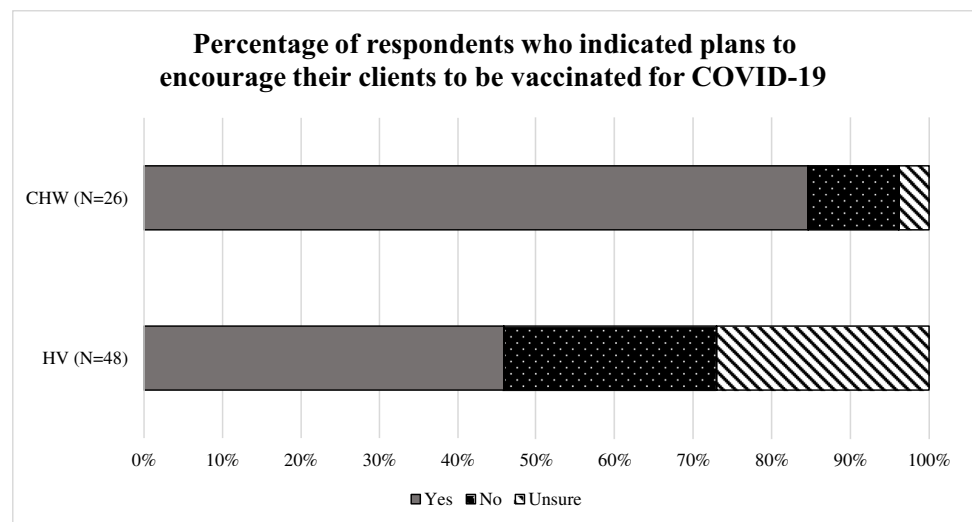
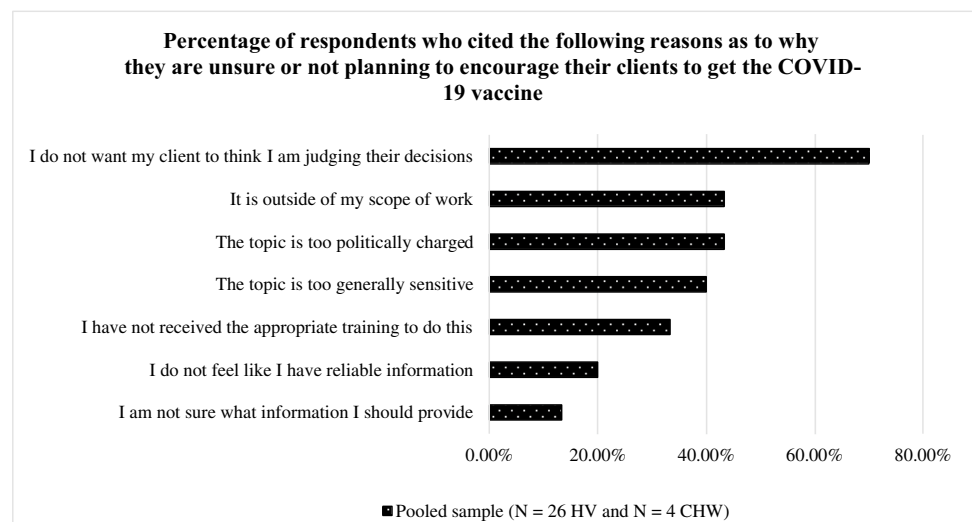


Fig. 5 Respondents who indicated that they were unsure or not planning to encourage their clients to get the COVID-19 vaccine were asked to select all the reasons that applied for why they were unsure or not planning to encourage their clients to get the COVID-19 vaccine. The HV and CHW samples were pooled for this figure given the small number ($N=4$) of the CHW sample who received this question. Abbreviations: COVID-19, coronavirus disease 2019 from infection with SARS-CoV-2; HV, home visitor; CHW, community health worker



HVs, those who perceived a greater threat were more likely to say they planned to encourage vaccination among their clients. While many respondents in both samples reported that they planned to encourage clients to get vaccinated against COVID-19, this number was greater among CHWs, and there was a significant difference between the HV and CHW sample responses regarding whether they were, were not, or were unsure about encouraging their clients to be vaccinated for COVID-19 ($P < 0.01$). Notably, a greater proportion of CHWs reported that their organization offered training related to COVID-19 vaccines (81% in the CHW sample compared to 56% in the HV sample, $P < 0.05$). However, there was no significant relationship between an individual's organization offering training in COVID-19 vaccines and plans to encourage clients to receive vaccinations among the two samples. A number of the reasons cited by HVs for not planning to encourage vaccination could be addressed with

training and resources (for example, "I have not received the appropriate training to do this," "It is outside of my scope of work," "I am not sure what information I should provide," and "I do not feel like I have reliable information"). Interestingly, the home visitor program includes training on motivational interviewing, and HVs routinely talk with their clients about early childhood vaccines. These results suggest a need to further examine vaccine-related training and the factors that make HVs and CHWs more likely to encourage their clients to get vaccines.

A qualitative study by Cáceres et al. (2022) with 22 promotoras/promotores de salud (CHWs) found that they described difficulty finding and discerning accurate information about COVID-19 and vaccines, despite being experienced promotoras/CHWs. Many suggested "leading by example" to combat the misinformation and increase vaccine uptake in the communities they served (Cáceres et al.

2022). Similar to the findings reported by Cáceres et al. (2022), our study contributes to the evidence base showing the importance of providing CHWs and HVs with accurate information, resources, and training about COVID-19. By ensuring accurate resources for everyone working in these settings, we can provide them with the tools to understand the complex messaging surrounding the topic and support them in encouraging their clients to pursue protective measures such as vaccination.

A study of the COVID-19-related training needs of CHWs in Texas by Byrd-Williams et al. (2021) found that respondents reported interest in a wide variety of training topics related to the pandemic, including prevention, community resources, clinical course of COVID-19, vulnerable populations, mental health, and general information related to COVID-19 (Byrd-Williams et al. 2021). While respondents in our survey reported that their organizations offered a variety of trainings related to COVID-19, there remained inconsistencies in what training topics were offered across respondents, and 25% of the HV and 8% of the CHW samples reported that no training related to COVID-19 had been offered to them. The results of our study and the findings from Byrd-Williams et al. (2021) both demonstrate the need for consistent and comprehensive training related to COVID-19 for people working in these roles with community members.

Limitations

There are important limitations that should be considered in the interpretation of our study. Our sample size is limited and there was a relatively low response rate. Our recruitment methods for the CHWs and HVs differed as well. Additionally, given that recruitment took place through two partner organizations, it is possible that local attitudes and cultures could have contributed to the findings in this survey. In the cases of both workforces, it is unlikely that we made contact with everyone working in these roles across the state of Wisconsin during the COVID-19 pandemic, and even among those who received our invitation, the experiences of those who chose to participate may differ from those who chose not to respond. Of note, the majority of respondents to our survey self-identified as female, which is not representative of the whole population. Lastly, the landscape of COVID-19 is rapidly changing, so the experiences and perspectives of respondents to our survey reflect those during the early stages of the COVID-19 pandemic. Additionally, the Wisconsin Supreme Court struck down the Safer at Home Order (Emergency Order #12) on May 13, 2020 (Beck and Marley 2020), which left the regulations to be determined at the level of the county, which could have led to variability among our respondents depending on the regulations in the

county they worked in. Further research will be required to compare trends over the course of the pandemic.

Conclusions

CHWs and HVs continued to support their clients and provided services throughout the beginning of the COVID-19 pandemic. While many CHWs and HVs identified the COVID-19 pandemic as a threat to the health of the US population, and had been or planned to be vaccinated themselves, respondents, particularly among HVs, were inconsistent regarding whether they planned to encourage their clients to receive vaccination for COVID-19. Some of the reasons cited for not encouraging their clients to receive vaccination for COVID-19 could likely be addressed with training. Given the unique role of CHWs and HVs in the community, future public health crisis responses should address the need to involve community-level programming strategically in all initial planning stages. The community-based public health and healthcare workforce are already embedded members of their communities, with the goal of promoting health and wellness. The existing relationship that CHWs and HVs have with community members can provide support in addressing obstacles and barriers related to trust.

Acknowledgements The authors would like to thank all of the community health workers and home visitors who took time to complete our survey.

We would like to thank Amy Godecker, PhD, for her guidance in statistical analyses.

Authors' contributions TJ: Contributed to the design of the project, participant recruitment, data analysis, interpretation of the data, and wrote the first draft of the manuscript.

KG: Contributed to the design of the project, participant recruitment, interpretation of the data, and revision of the manuscript.

NS: Contributed to the design of the project, interpretation of the data, and revision of the manuscript.

SG: Contributed to the design of the project, interpretation of the data, and revision of the manuscript.

BG: Contributed to the design of the project, interpretation of the data, and revision of the manuscript.

LW: Contributed to the design of the project and revision of the manuscript.

DE: Contributed to the design of the project, interpretation of the data, and revision of the manuscript.

All authors read and approved the final version of the manuscript.

Funding This work was supported by an ICTR-WPP COVID-19 Response Grant Award, the Herman and Gwendolyn Shapiro Foundation, and the University of Wisconsin-Madison Prevention Research Center* [*The University of Wisconsin-Madison Prevention Research Center is a member of the Prevention Research Centers (PRC) Program. It is supported by the Centers for Disease Control and Prevention cooperative agreement number 1U48DP006383 (PI Cox).]

Data availability The questionnaire used in this project is available by request to the corresponding author.

Code availability The Microsoft Excel and R quantitative analysis programs were used for this project. Common themes in qualitative data were identified using Microsoft Excel.

Declarations

Ethical statement This manuscript has not been presented elsewhere or submitted to another journal for publication. In addition, this work has not been split into parts for multiple publications. All of the authors contributed to this work and the findings are truthfully stated.

Ethics approval This study was determined to be exempt by the University of Wisconsin-Madison Health Sciences Institutional Review Board.

Consent to participate The people who participated in the survey for this project completed a consent form prior to completing the survey.

Consent for publication N/A

Conflicts of interest/Competing interests The authors have no relevant interests to disclose.

References

- Altarum (n.d.) Report for COVID-19 Ambulatory Clinic Survey. https://data.surveygizmo.com/r/321870_5e99b794815de4.44267546. Accessed 27 May 2021
- Balcazar H, Lee Rosenthal E, Nell Brownstein J, Rush CH, Matos S, Hernandez L (2011) Community health workers can be a public health force for change in the United States: three actions for a new paradigm. *Am J Public Health* 101(12):2199–2203
- Beck M, Marley P (2020) Wisconsin Supreme Court strikes down Wisconsin's stay-at-home order that closed businesses to limit spread of coronavirus. *Milwaukee Journal Sentinel*. <https://www.jsonline.com/story/news/politics/2020/05/13/wisconsin-supreme-court-strikes-down-tony-evers-coronavirus-orders/5179205002/>. Accessed 31 October 2022
- Blumenthal D, Fowler EJ, Abrams M, Collins SR (2020) COVID-19—implications for the health care system. *N Engl J Med* 383(15):1483–1488. <https://doi.org/10.1056/NEJMs2021088>
- Byrd-Williams C, Ewing M, Rosenthal EL et al (2021) Training Needs of Community Health Workers Facing the COVID-19 Pandemic in Texas: A Cross-Sectional Study. *Front Public Health* 9:689946. <https://doi.org/10.3389/fpubh.2021.689946>
- Cáceres NA, Shirazipour CH, Herrera E, Figueiredo JC, Salvy SJ (2022) Exploring Latino Promotores/a de Salud (Community Health Workers) knowledge, attitudes, and perceptions of COVID-19 vaccines. *SSM Qual Res Health* 2:100033. <https://doi.org/10.1016/j.ssmqr.2021.100033>
- Callaghan T, Moghtaderi A, Lueck JA et al (2021) Correlates and disparities of intention to vaccinate against COVID-19. *Soc Sci Med* 272:113638. <https://doi.org/10.1016/j.socscimed.2020.113638>
- Division of Primary Care and Health Access, Bureau of Family and Community Health, Center for Community Health, Massachusetts Department of Public Health (2005) Community Health Workers: Essential to Improving Health in Massachusetts Findings from the Massachusetts Community Health Worker Survey. <https://www.mass.gov/doc/massachusetts-community-health-worker-report/download>. Accessed 27 May 2021
- Dobis EA, McGranahan D (2021) Rural Residents Appear to be More Vulnerable to Serious Infection or Death From Coronavirus COVID-19. U.S. Department of Agriculture. <https://www.ers.usda.gov/amber-waves/2021/february/rural-residents-appear-to-be-more-vulnerable-to-serious-infection-or-death-from-coronavirus-covid-19/>. Accessed 27 May 2021
- Dror AA, Eisenbach N, Taiber S et al (2020) Vaccine hesitancy: the next challenge in the fight against COVID-19. *Eur J Epidemiol* 35(8):775–779. <https://doi.org/10.1007/s10654-020-00671-y>
- Evers T and Palm A (2020) Wis. Emergency Order no. 12, <https://evers.wi.gov/Documents/COVID19/EMO12-SaferAtHome.pdf>. Accessed 27 May 2021
- Funk C and Tyson A (2021) Growing Share of Americans Say They Plan To Get a COVID-19 vaccine – or Already Have. Pew Research Center. <https://www.pewresearch.org/science/2021/03/05/growing-share-of-americans-say-they-plan-to-get-a-covid-19-vaccine-or-already-have/>. Accessed 27 May 2021
- HRSA Maternal and Child Health (2022) Important Home Visiting Information During COVID-19. <https://mchb.hrsa.gov/programs-impact/programs/home-visiting/important-home-visiting-information-during-covid-19>. Accessed 31 October 2022
- KFF (2021) KFF and Washington Post Frontline Health Care Workers Survey. <https://files.kff.org/attachment/Topline-KFF-and-Washington-Post-Frontline-Health-Care-Worker-Survey.pdf>. Accessed 27 May 2021
- Kiester E, Vasquez-Merino J (2021) A virus without papers: Understanding COVID-19 and the impact on immigrant communities. *J Migr Hum Secur* 9(2):80–93
- Leischow SJ, Milstein B (2006) Systems thinking and modeling for public health practice. *Am J Public Health* 96(3):403–405. <https://doi.org/10.2105/AJPH.2005.082842>
- Malcarney MB, Pittman P, Quigley L, Horton K, Seiler N (2017) The changing roles of community health workers. *Health Serv Res* 52(Suppl 1):360–382. <https://doi.org/10.1111/1475-6773.12657>
- Marshall J, Kihlström L, Buro A et al (2020) Statewide implementation of virtual perinatal home visiting during COVID-19. *Matern Child Health J* 24(10):1224–1230. <https://doi.org/10.1007/s10995-020-02982-8>
- Mayfield-Johnson S, Smith DO, Crosby SA et al (2020) Insights on COVID-19 From Community Health Worker State Leaders. *J Ambul Care Manag* 43(4):268–277. <https://doi.org/10.1097/JAC.0000000000000351>
- MedScape (2021) Should Clinicians Be Required to Get COVID-19 Vaccines? <https://www.medscape.com/viewarticle/950067>. Accessed 27 May 2021
- Mersky JP, McKelvey LM, Janczewski CE, Fitzgerald S (2021) Effects of COVID-19 on home visiting services for vulnerable families: A cross-state analysis of enrollment, engagement, and attrition patterns. *Fam Syst Health* 40(2):262–267. <https://doi.org/10.1037/fsh0000667>
- Microsoft Corporation (2021) Microsoft Excel. Available at: <https://office.microsoft.com/excel>. Accessed 31 May 2023
- Minnesota Department of Health (n.d.) Health Care Provider COVID Survey Results May 4 through September 2, 2020. <https://www.health.state.mn.us/data/workforce/covidsurvey/docs/surveyresults.pdf>. Accessed 27 May 2021
- Murthy BP, Sterrett N, Weller D et al (2021) Disparities in COVID-19 Vaccination Coverage Between Urban and Rural Counties - United States, December 14, 2020-April 10, 2021. *MMWR Morb Mortal Wkly Rep* 70(20):759–764. <https://doi.org/10.15585/mmwr.mm7020e3>
- National Heart, Lung, and Blood Institute (2014) Role of Community Health Workers. <https://www.nhlbi.nih.gov/health/educational/healthdisp/role-of-community-health-workers.htm>. Accessed 27 May 2021
- North Carolina Department of Health and Human Services (2017) North Carolina Community Health Worker Survey. <https://www.ncdhs.gov/media/6652/download>. Accessed 27 May 2021

- Oparah JC, James JE, Barnett D et al (2021) Creativity, Resilience and Resistance: Black Birthworkers' Responses to the COVID-19 Pandemic. *Front Sociol* 6:636029. <https://doi.org/10.3389/fsoc.2021.636029>
- Peretz PJ, Islam N, Matiz LA (2020) Community health workers and COVID-19—addressing social determinants of health in times of crisis and beyond. *N Engl J Med* 383(19):e108. <https://doi.org/10.1056/NEJMp2022641>
- Perry HB, Zulliger R, Rogers MM (2014) Community health workers in low-, middle-, and high-income countries: an overview of their history, recent evolution, and current effectiveness. *Annu Rev Public Health* 35:399–421. <https://doi.org/10.1146/annurev-publhealth-032013-182354>
- Qualtrics (2021) Provo, Utah, USA. Version June, 2021. Available at: <https://www.qualtrics.com>
- RStudio, PBC (2022) Version RStudio 2022.02.1 Build 461. RStudio. Available at: <https://www.rstudio.com/>
- Roben CK, Kipp E, Schein SS, Costello AH, Dozier M (2022) Transitioning to telehealth due to COVID-19: Maintaining model fidelity in a home visiting program for parents of vulnerable infants. *Infant Ment Health J* 43(1):173–184. <https://doi.org/10.1002/imhj.21963>
- Rybińska A, Best DL, Goodman WB, Weindling W, Dodge KA (2022) Home Visiting Services During the COVID-19 Pandemic: Program Activity Analysis for Family Connects. *Matern Child Health J* 26(1):70–78. <https://doi.org/10.1007/s10995-021-03337-7>
- Sandstorm H (2019) Early Childhood Home Visiting Programs And Health. *Health Affairs*. <https://www.healthaffairs.org/doi/10.1377/hpb20190321.382895/full/>. Accessed 27 May 2021
- St. John J, Byrd-Williams C, Rosenthal EL, et al. (2021) The Final Report of the Community Health Worker COVID-19 Impact Survey: Texas Results & Methodology. The University of Texas at Houston Health School of Public Health; Texas Tech Health Science Center El Paso Paul L. Foster School of Medicine; & Texas Tech Health Science Center School of Biomedical Sciences. https://www.dshs.state.tx.us/Community_Health_Worker_COVID-19_Impact_Survey_Report_Texas.pdf. Accessed 27 May 2021
- Survey of the Health of Wisconsin (n.d.) COVID-19 Survey Wave One. <https://show.wisc.edu/covid-19/covid-19-projects/covid-19-public-use-data/>. Accessed 27 May 2021
- Traube D, Gozalians S, Duan L (2022) Transitions to virtual early childhood home visitation during COVID-19. *Infant Ment Health J* 43(1):69–81. <https://doi.org/10.1002/imhj.21957>
- Williams K, Ruiz F, Hernandez F, Hancock M (2021) Home visiting: A lifeline for families during the COVID-19 pandemic. *Arch Psychiatr Nurs* 35(1):129–133. <https://doi.org/10.1016/j.apnu.2020.10.013>
- Wisconsin Community Health Worker Network (n.d.) Wisconsin Community Health Worker (CHW) Network. <https://www.wichwnetw rk.com/About-us>. Accessed 27 May 2021
- Wisconsin Department of Children and Families (n.d.) Family Foundations Home Visiting Program. <https://dcf.wisconsin.gov/cwportal/homevisiting>. Accessed 27 May 2021
- Wisconsin Department of Health Services (2020) WISH: Urban and Rural Counties. <https://www.dhs.wisconsin.gov/wish/urban-rural.htm>. Accessed 27 May 2021
- Wisconsin Department of Health Services (2022) COVID-19: Racial and Ethnic Disparities. <https://www.dhs.wisconsin.gov/covid-19/disparities.htm>. Accessed 27 May 2021
- World Health Organization & United Nations Children's Fund (UNICEF) (2021) The role of community health workers in COVID-19 vaccination: implementation support guide, 26 April 2021. World Health Organization. <https://apps.who.int/iris/handle/10665/340986>. License: CC BY-NC-SA 3.0 IGO. Accessed 31 October 2022

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

Springer Nature or its licensor (e.g. a society or other partner) holds exclusive rights to this article under a publishing agreement with the author(s) or other rightsholder(s); author self-archiving of the accepted manuscript version of this article is solely governed by the terms of such publishing agreement and applicable law.