Assessing COVID-19 Vaccine Hesitancy and Trust in Home Health Workers in New York City: A Pilot Study

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Objective: This study aimed to identify characteristics surrounding COVID-19 vaccine hesitancy and trust in home health workers (HHWs) in New York City. **Methods:** Data were collected from HHWs through focus group sessions conducted via Zoom. We developed a facilitator guide using the 5C Scale, a validated psychometric tool for assessing vaccine hesitancy. We performed qualitative thematic analysis using a combined inductive and deductive approach. **Results:** Major themes that emerged included the following: conflicting information decreased vaccine confidence; individualized outreach is valued when information gathering; mandates and financial incentives may increase skepticism; low health literacy and conflict in personal relationships are barriers to acceptance; and experiencing a severe infection and fear of exposure at work increase acceptance. **Conclusions:** Based on our study, personalized yet consistent messaging may be key to reaching hesitant HHWs.

Keywords: vaccination hesitancy, home health care, home health aides, COVID-19 vaccines, qualitative research, focus groups, New York City

LEARNING OUTCOMES

- Describe factors contributing to COVID-19 vaccine hesitancy in home health workers.
- Describe factors contributing to acceptance of COVID-19 vaccines in home health workers.
- Identify possible interventions that could increase COVID-19 vaccine acceptance in hesitant home health workers.

Despite available evidence supporting the safety and efficacy of COVID-19 vaccines, vaccine hesitancy has been a public health concern since the rollout of the vaccines in late 2020 and early 2021.[1]

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The World Health Organization defines vaccine hesitancy as "the reluctance or refusal to vaccinate despite the availability of vaccines."[2] The etiology of COVID-19 vaccine hesitancy in the United States is multifactorial, with prior research suggesting broad distrust in vaccines, concern about the speed of manufacturing and mRNA technology, negative experiences with the healthcare system, and distrust of authority as possible contributors to hesitancy.[1] Furthermore, certain sociodemographic groups are more likely to report hesitancy, including younger adults, women, Black persons, adults living in nonmetropolitan areas, and adults with lower educational attainment, lower income, and without health insurance.[3] Given the disproportionate rates of COVID-19 morbidity and mortality in unvaccinated individuals, there is a need to better understand vaccine hesitancy in vulnerable populations. One such group that has received little research focus to date are home health workers (HHWs).

HHWs provide hands-on long-term care and personal assistance to clients with disabilities or other chronic conditions.[4] They include both skilled workers, such as nurses, physical and occupation therapists, social workers, or hospice workers and unskilled workers, such as home health aides (HHAs). Depending on their level of training, HHWs perform a variety of job duties, from assisting activities of daily living to clinically focused tasks such as medication administration and wound care.[4] Even before the COVID-19 pandemic, HHWs often experienced very little control over their work environment, encountering potential hazards such as exposure to blood-borne pathogens, ergonomic hazards from patient lifting, and unhygienic and dangerous conditions at clients' homes.[4] The COVID-19 pandemic posed additional risks to HHWs, including limited availability of personal protective equipment (PPE) and disinfectants, limited communication with their home health agencies and supervising nurses, and lack of clear reporting on the COVID-19 status of their patients.[5]

A large and particularly vulnerable subgroup of the HHW workforce are HHAs. HHAs are unskilled workers either employed by home health agencies or are self-employed independent contractors. There are over 3.4 million HHAs in the United States,[6] predominantly composed of women of color and earning wages near the poverty level, a demographic that bears a disproportionate burden of COVID-19 morbidity and mortality.[5] HHAs spend significant periods of time helping their clients with activities of daily living, often unable to socially distance. Prior research found roughly one in four HHAs in the greater New York City (NYC) area reported not having adequate access to PPE in the beginning of the pandemic and over three quarters of HHAs reported having to buy their own PPE.[7] One qualitative study examining the experiences of HHAs during the pandemic found that they had limited access to COVID-19 testing, limited hand hygiene products in their patients' homes, and often felt isolated from the rest of their healthcare team due to limited communication.[5] The pandemic also put a psychosocial strain on HHAs. Although workers found themselves caring for patients experiencing higher rates of depression during the pandemic, they reported receiving very limited emotional support for themselves.[58]

Despite the unique risks that HHWs, particularly HHAs, encountered during the COVID-19 pandemic, their vaccination rates largely lagged behind those of other healthcare workers, especially early in vaccine rollout.[9] According to a Kaiser Family Foundation survey, only 34% of HHWs reported being vaccinated for COVID-19 in

March 2021, compared with 80% of hospital health workers.[10] Given the considerable risks of COVID-19 to HHWs, it is important that we learn more about the reasons behind vaccine hesitancy.[11] In this qualitative focus group study, we aimed to identify the characteristics surrounding COVID-19 vaccine hesitancy and trust in HHWs in NYC. Even though COVID-19 was declared to no longer be a global health emergency,[12] HHWs will need continued protection against COVID-19 and other vaccine preventable diseases due to the nature of their work. Therefore, findings from our study can be compared with existing toolkits and public health interventions addressing vaccine hesitancy to better target HHWs.

METHODS

Study Recruitment and Participants

We recruited HHWs from two home health agencies based in NYC and from members of a healthcare union, the Service Employees International Union (SEIU), Local 1199. Home health workers were eligible to participate if they had access to a computer or smart gadget with Zoom capabilities, spoke English, were older than the age of 18 years, and had worked as an HHW in NYC during the COVID-19 pandemic (March 2020 through time of study recruitment). Focus groups were conducted between December 2021 and July 2022 over a password-protected video conference platform (Zoom).

We used a combination of convenience and purposive sampling strategy until saturation was reached (eg, continuing to sample until themes began to repeat and no new substantive insights were identified in the focus group sessions).[12,13] The two home health agencies and the union from which we recruited distributed recruitment flyers and emails to their employees. All employees were screened to ensure they met the aforementioned inclusion criteria before consenting and entering the study. In addition, one agency helped to identify workers who were late vaccine adopters or who were currently on leave from failing to comply with the New York state mandate for healthcare workers.[14] Subjects were consented over the phone by a member of the research team and signed an electronic consent form via Research Electronic Data Capture (REDCap). The study received approval from the institutional review board at Icahn School of Medicine at Mount Sinai (STUDY-21-00884-CR001), and all participants provided informed consent.

Data Collection and the 5C Scale Model

We designed a semistructured facilitator guide using a comprehensive set of open-ended questions based on the 5C Scale, a validated psychometric tool for assessing vaccine hesitancy.[15] The 5C Scale was developed to identify trends in vaccine hesitancy and design strategies to increase vaccine uptake. Within the model, the five psychological antecedents postulated to affect hesitancy are confidence, complacency, constraints, calculation, and collective responsibility.[15] The 5C Scale has been used as a reliable measure of vaccine hesitancy for COVID-19 and other vaccines.[16,17]

Two members of the research team served as moderators for the focus groups. All focus groups were audio-recorded and transcribed verbatim by a transcription company (Rev.com). Participants consented to recording before the focus groups and transcripts were deidentified. In addition, an anonymous, optional online demographics questionnaire was conducted at the start of each focus group session via REDCap. Participants received a link to the REDCap survey at the beginning of the session through the Zoom platform or email. Participants who completed the focus group received a $150 cash gift card for their time.

Data Analysis

We performed descriptive data analysis from the demographics survey to summarize the characteristics of our study population. We calculated means and standard deviations for continuous variables, and frequency and percentages of the sample for categorical variables.

Focus group data were analyzed thematically to identify and generate key themes and subthemes. The analysis was conducted using a combined inductive and deductive approach, which involved developing codes based on the research questions (deductive) and allowing themes to emerge from the data (inductive). This analysis composed of two stages.

In stage 1, three research team members (C.A.M., C.V., and S.Y.) used open coding to establish an overview of the raw data and to become familiar with the content. Using Dedoose qualitative software (Dedoose Version 9.0.62), the team members coded the transcripts individually to explore various meanings and patterns within the data and resolve any areas of disagreements within codes. After the first two transcripts were reviewed and a code scheme was developed, preliminary codes were consolidated into a codebook. The research team then recoded the two transcripts using the uniform codebook and applied them to the remaining transcripts. The research team met to revise the codebook after reviewing each transcript, with the final codebook containing 78 unique codes and subcodes.

In stage 2, the research team sorted and grouped central codes into initial categories using the domains of the 5C Scale: confidence, complacency, constraints, calculation, and collective responsibility. Categories were then assembled into central themes that provide meaning and highlighted overarching patterns in the data. Ultimately, the themes were centered around the factors that facilitated or hindered HHWs trust and decision to obtain the COVID-19 vaccine.

RESULTS

Participant Characteristics

A total of 32 HHWs participated in six different focus groups between December 2021 and July 2022. Of those, 26 participants (81.3%) participated in the optional, anonymous demographics survey

TABLE 1. Sociodemographic Characteristics of Study Participants

Baseline Characteristics	Mean	SD
Age (years)	48.2	13.3
	n	%
Gender identity		
Female	25	96.2
Male	1	3.8
Hispanic/Latinx		
Yes	9	34.6
No	16	61.5
Missing	1	3.8
Ethnicity		
Black/African American	12	46.2
Other	7	27.0
White	4	15.3
Asian	2	7.7
Missing	1	3.8
Occupation		
Home health aide	19	73.1
Physical therapist	4	15.4
Other	2	7.7
Nurse	1	3.8
Received at least 1 dose of COVID-19 vaccine	26	100
Date of first COVID-19 vaccine		
December 2020–March 2021	13	50.0
April 2021–July 2021	4	15.4
August 2022 or later*	6	23.1
Prefer to not answer	3	11.5

*The New York State vaccine mandate for healthcare workers was announced on August 16, 2021 and was put into effect for home health agencies on October 7, 2021.[17]

administered before the focus group (see Table 1). The mean age of participants was 48.2 years, ranging from 25 to 67 years (SD = 13.3).

Ninety-six percent of our participants identified as female, 34.6% identified as Hispanic/Latinx, and 46.2% identified as Black/African American. Seventy-three percent of health workers identified as HHAs. The remaining participants identified as home physical therapists, nurses, or "other" as their occupation.

All participants who completed the survey reported that they received at least one dose of the COVID-19 vaccine, with 50% identifying as "early adopters"—receiving the vaccine between December 2020 to March 2021 when the vaccine was first offered to healthcare workers in NYC.

Approximately 15% were "mid-adopters" receiving the vaccine from April to July 2021, when the vaccine was widely available to both healthcare workers and the public, but no vaccine mandates were in place. Almost a quarter of participants (23.1%) were "late adopters," receiving the vaccine August 2021 or later, after the mandate was announced (August 16, 2021) and/or after it was already in effect (October 7, 2021).[14,18] In addition, 11.5% of participants preferred to not answer when they received the vaccine. It is of note that the 100% compliance rate answered on the survey contradicts information shared in the focus group discussions, in which some participants revealed that they were on leave from their job for not receiving the vaccine.

Qualitative Thematic Analysis

Our qualitative thematic analysis yielded the following major themes that focused on hesitancy and trust with the COVID-19 vaccine. The results section follows the general 5C Scale framework, with themes falling into one of the five psychological antecedents of vaccination listed below (see Fig. 1).

CONFIDENCE

Theme 1: Conflicting Information Led to Decreased Confidence in Vaccine Safety and Efficacy

Conflicting information was a recurrent theme among HHWs who expressed hesitancy regarding the COVID-19 vaccine. Workers described a variety of sources used to obtain information about the vaccine, including the news, social media, primary care doctors, employers, peers, and family. However, workers expressed concern when different sources of information relayed different messaging about the vaccine.

> *"Everybody has a story and you don't even know who's basically telling the truth… the doctor says one thing, the TV says another, the president said another thing, the CDC says another one."*

In addition to conflicting messages, workers expressed further concern when they saw news stories or social media accounts of doctors, nurses, and other health professionals refusing the vaccine or claiming it was unsafe.

> *"If it's so good and if it's good for us, why are there so many contradictions about it …why are so many nurses against it? Why are there so many doctors that don't take it?"*

Not only did conflicting information decrease confidence, but so did frequently changing information. HHWs cited that the frequently changing guidelines, like those surrounding masking in the beginning of the pandemic, led to lower trust down the road when it came to vaccine recommendations.

Confidence	**Trust in the effectiveness and safety of vaccines and the system that delivers them.**	
Theme 1	Conflicting information led to decreased confidence in vaccine safety and efficacy.	*"I don't like if it comes from so many different people […] everybody has a story and you don't even know who's basically telling the truth…Because it's either the doctor says one thing, the TV says another, the president said another thing, the CDC says another one."*
Theme 2	Skepticism of financial incentives may weaken confidence in the vaccine.	*"Why are you going to pay me for me to take something that is going to protect me… They feel like there's something fishy going on that they're not telling us."*
Constraints	**Structural and psychological barriers, such as physical availability, affordability, geographical accessibility, ability to understand, and appeal of immunization services, that affect vaccine uptake.**	
Theme 3	Low health literacy is a barrier to vaccine uptake.	*"I was really tense to take the vaccine because listening on social media and people coming up, talking about, 'Don't take it. It will cause so much different side effects.'"*
Theme 4	Conflict in personal relationships is a barrier to vaccine uptake.	*"He kept saying, "Start looking for another job," when it was like two or three months before, "Start looking for something else, maybe over here in Connecticut because they're not mandating it."*
Collective Responsibility	**The willingness to protect others by one's own vaccination by means of herd immunity.**	
Theme 5	Vaccine acceptors expressed a responsibility to get vaccinated to protect their patients.	*"We have some kind of responsibility as home care aide. If I get something, I can transmit the virus to our clients. Right? I was very happy when I started hearing the news about that the vaccine coming."*
Theme 6	The vaccine mandate caused concern for loss of autonomy.	*"This is the United States of America. People come here because we got freedom to choose what we want. How is it now they're taking that freedom away from us and making us choose something that we don't want into our body."*
Calculation	**An individuals' engagement in extensive information searching.**	
Theme 7	Personal stories and individualized outreach are valued when information gathering.	*"I do trust one of the nurses at my job, which is one of my supervisors… I've known her for over 20 years…her talking to me and telling me, 'Listen, I got it. It's okay. You're going to be okay'… talking to her made it a lot easier. I was a little calmer. And I'm like, "You know what, let me just get it."*
Complacency	**When perceived risks of vaccine-preventable diseases are low and vaccination is not deemed a necessary preventive action.**	
Theme 8	"Life-changing events" such as experiencing a severe COVID-19 infection influenced hesitant workers to get the vaccine.	*"The person that I caught COVID from, she passed away. I came home on oxygen, and it was hard for me to breathe, to do anything… If you can take the vaccination, I would tell them to take it."*
Theme 9	HHWs expressed they are at increased risk for COVID-19 infection due to the nature of their work.	*"Working in home care, we are more exposed because we're surrounded by more people. I think people that worked in inpatient facilities, there were more rules in place. It seems like in home care, we're just exposed to more people who we don't even know if they have it."*

FIGURE 1. Thematic analysis results: themes and illustrated quotes as grouped by the 5C Scale for vaccine hesitancy.[15]

"I don't trust [government organizations] because they change or give new information every day."

Conversely, consistent information increased vaccine confidence and was a protective factor for trust in the vaccine.

"When I watched the news, two different channels, and online, as long as the numbers were very similar to the same, that gave me comfort."

Not only was consistent information across news outlets and medical organizations important but workers also expressed trust when trends broadcasted on the news reflected what they saw in their own patients.

"When I started to see lesser numbers, patients not coming onto our program with COVID … that was just seeing the visual facts of it without even having to hear data and statistics, I could see it with my own eyes."

Theme 2: Skepticism of Financial Incentives May Weaken Confidence in the Vaccine

After the initial launch of the COVID-19 vaccines to the public, government organizations around the country and globe started to use monetary incentives to motivate hesitant residents.[19] In NYC, the local government gave $100 to New Yorkers who got vaccinated at city-run vaccination sites.[20] In addition, some focus group participants shared that their employers provided additional monetary incentives. Subjects voiced mixed feelings regarding the financial incentives. While some workers reported collecting an incentive and endorsed the concept, others felt skeptical.

"If you think that this is to protect me, why are you then paying me? Because then it means that there are selling things that you're not letting me know, that is why you're paying me that hundred dollars. So people are not taking it because of that."

"Why are you going to pay me for me to take something that is going to protect me… They feel like there's something fishy going on that they're not telling us."

As the two workers voiced previously, the idea of the government paying its citizens to complete a preventive health measure led them to further question the safety of the vaccine.

CONSTRAINTS

Theme 3: Low Health Literacy Is a Barrier to Vaccine Acceptance

HHWs were asked how they gathered information about the COVID-19 vaccine. During these discussions, health literacy emerged as a factor that influenced vaccine acceptance. Many workers who shared they mostly used social media and friends/family as sources of information expressed mixed feelings regarding vaccine safety.

"I was really tense to take the vaccine because listening on social media and people coming up, talking about, 'Don't take it. It will cause so much different side effects.'"

Some hesitant workers expressed concerns about the government lying about the number of COVID-19 deaths and shared anecdotes they heard of the vaccines directly causing long-term harm or even death.

"They lie about the number of deaths…when Cuomo got in trouble by not reporting all of the number of deaths. So I don't really trust [the government] too much."[*]

In addition, HHWs across multiple focus groups brought up concerns regarding vaccine safety in pregnancy.

"Me and my husband were trying to have a baby. And then they were saying that once you take the vaccine, you're not going to be able to give birth anymore, it's going to give you certain diseases and stuff like that, your immune system is going to go low. And that was what I was thinking about."

Conversely, HHWs who expressed trust in scientific research and used research articles and surveillance data when gathering information about the vaccine tended to express higher levels of acceptance.

"I trust the science and I trust the studies that were done and once it was out, again, I just went for it."

"I was getting quantitative data about how it was working based on hospital numbers. That's how I felt comfortable knowing I made the right decision."

In addition, HHWs who expressed knowledge specifically about the vaccine development process tended to have more favorable views of the vaccine, whereas those who expressed concerned about the speed of development and/or felt like they did not fully understand the development process were more hesitant.

"They were rushing. That is my belief… it's really early. We don't know the research and the benefits of it… I want the important information about the vaccine before you take it."

"Some of my friends were saying for decades, scientists have been studying to find a cure for cancer and nobody have come up with anything that can make one survive. What guarantee do we have in taking this vaccine that will make us survive the virus?"

Theme 4: Conflict in Personal Relationships Is a Barrier to Vaccine Acceptance

When asked about barriers, multiple HHWs voiced that conflict in personal relationships was a significant obstacle in their decision to get the COVID-19 vaccine. Specifically, HHWs who had a spouse or partner who was hesitant about the vaccine affected the HHW's decision, especially when the vaccine mandate went into effect. Multiple HHWs voiced that their partners or family members asked them to either get a new job or move out of state to avoid the vaccine mandate. Some workers ultimately chose to get vaccinated despite their partners or families' opinions.

"We sat in the car for almost like an hour. He was trying to convince me to go home because, 'Why are you taking it? If your job doesn't want you, you can find another job'…it was a heated argument between me and him right before I took my vaccine."

"He kept saying, 'Start looking for another job,' when it was like 2 or 3 months before, 'Start looking for something else, maybe over here in Connecticut because they're not mandating it.'"

COLLECTIVE RESPONSIBILITY

Theme 5: Vaccine Acceptors Expressed a Responsibility to Get Vaccinated to Protect Their Patients

Some HHWs, particularly early vaccine acceptors, cited collective responsibility, or the willingness to protect others by means of

[*]Of note, former governor of New York, Andrew Cuomo, was found to have falsified and underreported COVID-19 mortality data in nursing homes in January 2021.[21]

herd immunity,[16] as motivation for vaccination. They expressed fear of infecting their clients due to the nature of their work, especially as many of their clients were elderly and/or had comorbidities that put them at risk for severe infection.

"…We have some kind of responsibility as home care aides. If I get something, I can transmit the virus to our clients. Right? I was very happy when I started hearing the news about that the vaccine coming."

"I agree that if we're in healthcare, we need to take responsibility, as well. We've seen too many people die from this virus and we need to work on lessening it, so I was in favor of it completely."

Theme 6: The Vaccine Mandate Caused Concern for Loss of Autonomy

Per the 5C Scale, collective responsibility is negatively correlated with individualism.[15] This concept was highlighted by focus group discussions surrounding the New York state vaccine mandate for healthcare workers. Hesitant HHWs overall had an unfavorable opinion of the vaccine mandate, repeatedly voicing concern for loss of autonomy.

"When we started being forced getting this or you lose your job, and I'm like, 'What?' This is the United States. This is the United States of America. People come here because we got freedom to choose what we want. How is it now they're taking that freedom away from us and making us choose something that we don't want into our body."

Hesitant workers expressed that the threat to autonomy should be valued over collective responsibility, with some workers expressing willingness to leave their jobs or knowing of others who have left their job over the mandate.

"With the mandates, I had a friend of mine that she refused to even go through to take the vaccine. She just prefers to quit her [job] because she was telling herself nobody shouldn't try to tell her how to live her life or what to do. She really didn't care. She quit her [job] for that."

CALCULATION

Theme 7: Personal Stories and Individualized Outreach Are Valued When Information Gathering

When asked how they gathered information, calculated their decisions, and formed their beliefs about the COVID-19 vaccine, hesitant workers expressed that much of the outreach they received felt impersonal, as if their employers and doctors were just repeating messaging from government organizations verbatim. This seemed to be especially true after the vaccine mandate was in place, as some workers expressed concerns that their job wanted all employees to be vaccinated to comply with the mandate, as opposed to caring about individual workers' best interests. While consistent information was valued, as discussed previously, hesitant workers particularly appreciated individualized outreach and the ability to bring up their unique questions and concerns.

"I have my friend from childhood …she's a neurologist. I always ask her what to do, what is better for me. She said, 'Yes, go today and get the vaccine.'"

"I trusted my auntie when she motivated me to take the vaccine is because … she's been with me since I was younger and she won't do anything to harm me."

As highlighted in the quotes aforementioned, outreach was particularly valued when it came from a personal connection, such as a trusted coworker, friend, or family member with medical knowledge. Another worker who expressed initial hesitancy toward the vaccine reported acceptance after a trusted nurse supervisor personally reached out to her to provide reassurance and address her personal concerns.

"I do trust one of the nurses at my job, which is one of my supervisors… I've known her for over 20 years…her talking to me and telling me, 'Listen, I got it. It's okay. You're going to be okay'… talking to her made it a lot easier. I was a little calmer. And I'm like, 'You know what, let me just get it.'"

COMPLACENCY

Theme 8: "Life-Changing Events" Such as Experiencing a Severe COVID-19 Infection Influenced Hesitant Workers to Get the Vaccine

For some HHWs, contracting COVID-19 influenced their decision to obtain the vaccine, as it changed their perceived risk and ultimately altered their complacency. One worker described the symptoms she experienced during her infection with COVID-19.

"It was a horrible feeling, a fever every day, 103 every day. I thought I was dead…When the vaccine came up, I was hesitant getting it, but I looked where I was at…and I took it."

Though she had expressed some vaccine hesitancy initially, her experience having COVID-19 helped her make the decision to obtain the vaccine, as she did not want to experience severe symptoms again. Similarly, other workers expressed watching a friend or loved one experience a severe infection or even die from COVID-19 is what ultimately motivated them to get vaccinated.

"The person that I caught COVID from, she passed away. I came home on oxygen, and it was hard for me to breathe, to do anything… If you can take the vaccination, I would tell them to take it, but like I said, it was hard to say that when I was a strong disbeliever of [the vaccine]…"

Theme 9: HHWs Expressed They Are at Increased Risk for COVID-19 Infection Due to the Nature of Their Work

Many HHWs expressed working in the home care setting posed unique challenges to their health during the COVID-19 pandemic. Compared with inpatient facilities, they felt that home care had fewer rules and protections.

"Working in home care, we are more exposed because we're surrounded by more people. I think people that worked in inpatient facilities, there were more rules in place. It seems like in home care, we're just exposed to more people who we don't even know if they have it."

One worker shared a story about their colleague who was caring for a patient without knowing about their COVID-19 exposure. During the house visit, the colleague overheard a family member talk about their positive COVID-19 test result.

"I just had my colleagues doing a house visit today and she said, 'I just heard an uncle, who's at the house, say on the phone, I'm COVID positive,' while she's in the same space as him. He still allowed her to come into a house knowing there was a COVID-positive case in the house."

DISCUSSION

This is one of the first qualitative studies to assess COVID-19 vaccine hesitancy in HHWs. Despite that many HHWs are at increased risk for COVID-19 due to workplace exposures and belonging to high-risk sociodemographic groups, vaccinations rates initially lagged

in this population compared with the rest of the healthcare workforce.[10] Using the 5C Scale for Vaccine Hesitancy, we found that several major themes emerged from our qualitative analysis, including conflicting information decreased confidence in vaccine safety and efficacy; personal stories and individualized outreach are valued when information gathering; vaccine mandates and financial incentives may increase skepticism; low health literacy and conflict in personal relationships are barriers to vaccine acceptance; and experiencing a severe COVID-19 infection and fear of exposure to COVID-19 at work increased vaccine acceptance.

Our study population of 32 HHWs who worked during the COVID-19 pandemic in NYC were largely women of color, which is highly reflective of the general U.S. HHW population.[5] In addition, only 50% of workers identified as "early" vaccine adopters, highlighting the lag of this occupation behind others in the healthcare workforce.[10] While New York State's vaccine mandate for healthcare workers in September 2021 increased vaccine uptake in all health workers to over 90%, some HHWs chose to leave their jobs to avoid vaccination,[22] which put a further strain on the existing national shortage of HHWs.[23] Many vaccine mandates around the country have been since lifted as COVID-19 hospitalizations and deaths have dropped and the federal public health emergency has ended.[24] While New York state's mandate still applies to healthcare workers, it has recently been contested in the state's courts.[25] Furthermore, many mandates do not require booster vaccinations, the absence of which could potentially put workers at increased risk for infection, as studies have shown waning immunity from the primary series over time and as new strains emerge.[26] Therefore, there is still a need to understand and address vaccine hesitancy in HHWs.

Comparing our findings to existing research and toolkits addressing vaccine hesitancy may help to better tailor future practices and policies toward hesitant HHWs. The CDC's *Vaccinate with Confidence* framework endorses transparent communication of vaccine information across federal, state, and local governments, including information on approving and authorizing of vaccines, making recommendations, and safety monitoring.[27] In addition, the framework promotes regular updates on vaccine safety, adverse effects, and effectiveness, including communicating what is not yet known.[27] Taking such actions corroborates our focus group findings, as we found that conflicting information decreased confidence in vaccine safety and efficacy. Because of how little was known about the COVID-19 virus in early 2020, the beginning of the pandemic was laden with frequently changing guidelines as the scientific community learned more about the virus.[28] Given the nature of a global pandemic with a novel virus, frequently changing information was likely unavoidable. However, maintaining transparency and keeping information consistent across government agencies, employers, and individual healthcare providers may be key in building trust with the HHW population.

In line with keeping information transparent, existing research and toolkits also highlight the need to address low health literacy and misinformation.[27,29,30] The CDC's *COVID-19 Vaccination Field Guide* discusses techniques to combat misinformation such as warning when misleading information is coming, using fewer arguments to refute myths, and keeping the factual statements simple.[30] The guide also highlighted the use of vaccine ambassadors from the community and trusted messengers to deliver messages as ways to increase health literacy, which correlates with our findings that personalized outreach is valued by HHWs. In addition, conflict in personal relationships was a unique barrier that has not classically been associated with vaccine hesitancy. This barrier once again highlights the need for a trusted messenger to deliver vaccine information and create a safe space to address unique questions and concerns. Talking with an individual, trusted source may facilitate conversation around difficult topics like interpersonal conflict, as HHWs may not be comfortable discussing such personal matters in front of coworkers or managers.

Of note, many HHWs in our study expressed some level of concern with vaccine safety during pregnancy and/or its effects on future fertility, highlighting the need for more education on this topic, especially as many HHWs are women of reproductive age. Future vaccine hesitancy interventions should therefore specifically target misinformation around vaccination and fertility/pregnancy in this population.

Addressing the topic of collective responsibility, early vaccine acceptors generally expressed an obligation to get vaccinated to protect their patients. In contrast, hesitant workers tended to value individualism and autonomy over collective responsibility, especially when discussing the vaccine mandate. Existing frameworks suggest vaccination requirements like mandates should be considered to increase vaccination rates.[27] While data have suggested that mandates did increase healthcare worker compliance with vaccination,[25,31] hesitant HHWs in our study emphasized that mandates do not address underlying mistrust around the vaccine and led some workers to even contemplate leaving the workforce or move to avoid vaccination. Therefore, additional interventions beyond mandates are important for increasing long-term trust and confidence in the COVID-19 vaccine.

In addition to mandates, some vaccine hesitancy toolkits and research have suggested financial incentives as a means to improve vaccination rates.[26,27,29,32,33] While some HHWs voiced appreciation of the $100 incentive offered by NYC, hesitant workers in our study group overall felt skepticism toward a government-funded incentive. It is important to note the historical context of unethical experimentation and exploitation in the United States of people who identify as Black, indigenous, and people of color, such as with the Tuskegee Study, as well as personal encounters with the health care system, which may contribute to mistrust in the medical system.[9,34] Recognizing this cultural context could potentially play a role in how financial incentives are viewed, which is supported by prior research.[9] In addition to financial incentives, prior research on vaccine hesitancy in HHAs also found workers expressed skepticism toward vaccine mandates.[9] Given that the HHW workforce is largely women of color, monetary incentives and mandates may paradoxically raise red flags and decrease trust in this population. Therefore, they may not be the best strategies to improve confidence in vaccine safety and efficacy in this specific portion of the healthcare workforce.

Another consideration for optimizing future interventions is how to effectively disseminate information about the vaccine. Prior toolkits have considered such tactics as standardized order sets and generalized messaging from a clinic or pharmacy targeting an entire panel of unvaccinated patients.[29,35] However, given that our study population strongly endorsed the importance of personalized outreach when information gathering, such general messaging may not be an effective intervention for the HHW population. The opinion of a trusted, well-known supervisor or colleague was valued over generalized messaging, supporting the use of a trusted messenger as discussed previously. This also correlates with prior research examining COVID-19 vaccine hesitancy in HHAs, which found that aides preferred delivery of tailored information by trusted sources.[9]

Finally, future interventions could consider the use of vaccine ambassadors within a home health agency or union to help set a culture around vaccination acceptance. Workers who experienced a "life-changing event" such as contracting a severe COVID-19 infection or knowing someone who experienced a negative health outcome from COVID-19 had a greater perceived risk of the virus and were more likely to be vaccinated. In addition, HHWs who perceived their work environment (eg, client homes) as a risk factor for COVID-19 also expressed increased vaccine acceptance. Using ambassadors who are members of the HHW community could help hesitant workers understand their unique risks by sharing their own experiences.

Limitations

Our study population was recruited from two home health agencies and one union located in NYC and therefore may not be generalizable to the larger U.S. population. In addition, in common with many focus group studies, our study population was self-selecting, and it is possible that workers with stronger opinions on vaccination were more

motivated to participate and voice their opinions during focus group discussion. Because some workers participated in focus groups with other members of their same agency or union, they may have not felt comfortable sharing their full thoughts and opinions around vaccination with coworkers.

A possible limitation to our conclusions was the discrepancy between the results of the demographics survey and the focus group discussion regarding vaccine uptake. Of those who completed the demographics survey, 100% reported they received at least one dose of the vaccine. However, multiple participants in the focus groups voiced that they were on leave from their jobs for not receiving any doses of the vaccine. The research team believes that this discrepancy could be due to social desirability bias and reluctance to report choosing to not be vaccinated. In addition, despite the fact that the survey was anonymous, participants who did not receive the vaccine may not have felt comfortable completing the demographics survey (six participants opted out of the survey). As the demographic survey was confidential and devoid of identifiers, we cannot link the survey nonresponders to their participation in the focus group.

Finally, our focus groups were limited to English speakers and those with access to a smart device/phone with Zoom capabilities. Given the large immigrant population who work as HHWs in the United States, we may have excluded a portion of the HHW workforce in our analysis. Our research team unfortunately did not have capacity to conduct focus groups in multiple languages in this pilot study. In addition, workers without access to a smart device may have represented a different sociodemographic group within the HHW population that we were unable to reach due to social distancing protocols. Future efforts could consider utilizing cross-sectional surveys or mixed methods research to better reach such populations that have barriers to participating in focus groups.

Conclusions

This is one of the first qualitative studies assessing COVID-19 vaccine hesitancy in HHWs, a vulnerable population within the healthcare workforce who have received little research focus. Based on our study, personalized yet consistent messaging may be key to reaching hesitant HHWs. Possible interventions include targeted outreach by a trusted messenger or vaccine ambassador within a home health agency or union to identify unique concerns and barriers in an empathetic manner while still relaying evidence-based information. In addition, prior methods used to increase vaccine uptake during the pandemic, such as vaccine mandates and financial incentives, may not be as effective in increasing long-term trust and confidence in the HHW population. These considerations are important given the persistent socioeconomic disparities in vaccination rates and the ever-changing landscape of vaccine mandates and booster doses.[24,36] Therefore, our study findings should be considered when creating future interventions and policies to address vaccine hesitancy and rebuild trust in this vulnerable group of workers.

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