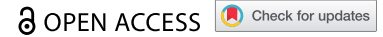


RESEARCH ARTICLE



# Factors influencing COVID-19 vaccine decision-making among hesitant adopters in the United States

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## ABSTRACT

Increasing COVID-19 vaccine uptake is crucial to managing the endemic. In this qualitative study, we examine factors influencing the decision-making process of COVID-19 hesitant adopters – those who reported some level of hesitancy and are vaccinated. Using interviews with 49 participants, we documented multiple factors influencing the decision-making process to get the COVID-19 vaccine among a racially and ethnically diverse sample of hesitant adopters in the US. Participants described influences related to sociocultural context and personal and group influences, which affected their decision to get the COVID-19 vaccine despite being hesitant. We find politics, culture, healthcare professionals, employment, vaccine attitudes and beliefs, social networks, and the media influence the decision to get vaccinated. Our findings provide nuanced and in-depth information in their own words. This study expands on prior literature on COVID-19 vaccine hesitancy, especially among hesitant adopters. These findings can inform future interventions and research targeting vaccine-hesitant populations to increase vaccine uptake.

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## Introduction

There have been more than 81 million COVID-19 cases and more than a million COVID-19-related deaths in the United States (US) since March 2020.<sup>1,2</sup> COVID-19 vaccines are effective at protecting individuals from serious illness and death from COVID-19.<sup>3</sup> Approximately 82.5% of Americans have received at least one COVID-19 vaccine dose, and 70.4% of the US population  $\geq 5$  years of age are fully vaccinated<sup>1</sup>; however, disparities in vaccination persist among racial and/or ethnic communities, many of whom report more hesitancy in COVID-19 vaccines.<sup>4–11</sup> The World Health Organization (WHO) identified vaccine hesitancy as a primary health concern with significant implications for global public health.<sup>12</sup> Vaccine hesitancy research has often counted the vaccinated as not hesitant<sup>13</sup>; however, this approach conflates vaccination behavior with vaccine attitudes.<sup>14</sup> Emerging research defines vaccine hesitancy as an attitude that is related to vaccine behavior. The attitude of vaccine hesitancy may or may not represent actual vaccination status.<sup>15</sup> Emerging research also suggests some individuals get vaccinated even while hesitant about COVID-19 vaccines.<sup>16–21</sup> Hesitant adopters are individuals who are both hesitant and vaccinated against COVID-19,<sup>18–20,21,22</sup> and they represent an understudied group who may provide valuable insights for future vaccine uptake interventions.

The World Health Organization's Determinants of Vaccine Hesitancy Matrix<sup>14,23</sup> has been used to describe the factors influencing the decision-making process.<sup>24,25</sup> In the Vaccine Hesitancy Matrix, vaccine hesitancy determinants are described as contextual influences (i.e., historical, socio-cultural, environmental, health system/institutional, economic,

or political factors) and individual and group influences (i.e., personal, social, and peer environment factors). The Vaccine Hesitancy Matrix provides a framework to examine the influences of vaccine acceptance and hesitancy.<sup>14,23–25</sup>

The literature documents a range of influential factors in the decision-making process to get the COVID-19 vaccine. Studies conducted before eligibility was expanded to include all individuals 12 years of age and older for COVID-19 vaccination in the US documented sociocultural and structural influences on the decision to be vaccinated, including political affiliation, ideology and partisanship, misinformation, the timing of vaccine availability, and level of trust in government.<sup>26–29</sup> In addition, studies have shown vaccine attitudes are influenced by the perceived level of risk and effectiveness of the available vaccine and concerns over vaccine safety.<sup>26,30–32</sup> Examinations of racial and/or ethnic minority participants' decisions to get the COVID-19 vaccine shows multiple influential factors in the decision-making process including a lack of reliable information, a mistrust of medical research, and vaccine access barriers.<sup>4,11,24</sup> However, there have been few qualitative studies with a broad and diverse sample of US adults, and little has been documented about the influential factors in the decision-making process among hesitant adopters of the COVID-19 vaccines.

This exploratory study used a qualitative descriptive design aimed at understanding and describing factors influencing the decision-making process to get the COVID-19 vaccine among a diverse racial and/or ethnic sample of hesitant adopters in the US. It is important to understand the factors influencing the decision-making process of hesitant adopters and document the influences that helped them get vaccinated while hesitant.

## Methods

### Study design and approach

A qualitative descriptive design<sup>33</sup> was used to explore factors influencing hesitant adopters' decision to get the COVID-19 vaccine using individual interviews. The University of Arkansas for Medical Sciences Institutional Review Board approved all study procedures and materials (IRB# 263020).

### Study sample, participant recruitment, and remuneration

From mid-September 2021 through mid-October 2021, participants ( $n = 2022$ ) who were 18 or older were recruited from an online research registry, maintained by an online research company,<sup>34</sup> of research volunteers across the US to participate in an online survey related to COVID-19. The survey captured participants' vaccine status, COVID-19 vaccine hesitancy level, demographic information, and if they would be willing to participate in a follow-up in-depth interview. To measure COVID-19 vaccine hesitancy, an existing measure of vaccine hesitancy was used to capture attitudes about the COVID-19 vaccine.<sup>35,36</sup> Survey respondents were asked, "Thinking specifically about the COVID-19 vaccine, how hesitant were you about getting vaccinated?" Response options included: "not at all hesitant," "a little hesitant," "somewhat hesitant," and "very hesitant." To avoid aggregation of racial and/or ethnic groups, which obscures diverse groups, experiences, and attitudes,<sup>37,38</sup> Asian American, Black/African American, Hispanic/Latino, American Indian or Alaska Native, and Native Hawaiian or Pacific Islander individuals were oversampled. The qualitative sample was drawn from those who completed the survey. The inclusion criteria to participate in the qualitative interviews included survey respondents who: had some level of hesitancy, had received the COVID-19 vaccine, and agreed to be contacted for an interview. Potential participants were excluded from participating in the qualitative interviews if they reported no hesitancy, had not received the COVID-19 vaccine, and did not agree to follow-up contact for an interview. 1,138 survey participants (56%) indicated they had received a COVID-19 vaccine, reported some level of hesitancy concerning the COVID-19 vaccine, and reported they were willing to participate in a follow-up interview. Those 1,138 participants were randomly ordered, and the first 225 adult males and 225 adult females were selected and sent an e-mail invitation to participate in the qualitative interviews. The first 25 males and 25 females who responded and scheduled a time were interviewed and comprise the study sample. Based on qualitative literature and prior studies conducted by the research team, 50 interviews were determined to be the appropriate amount to target for the qualitative sample to reach data saturation where no new information is obtained.<sup>39,40</sup> Zip code and county information were collected from all participants to document a diverse geographical distribution among the analytic sample. Participants who completed an interview received a \$75 e-check via e-mail.

### Data collection

In-depth, individual interviews were used to collect data from 50 participants; however, one interview transcript was excluded

from analysis because the participant did not meet the inclusion criteria related to COVID-19 vaccine hesitancy. Two female and three male researchers conducted the interviews. The research staff was assigned to interview participants based on availability. All staff who conducted interviews have experience with facilitating interviews and participated in training sessions related to the study protocol, which included three mock interview sessions. Participants were emailed a unique URL link that corresponded with their scheduled interview date and time. All interviews were conducted with a secured video conferencing platform and telephone.<sup>41,42</sup> Interviews with participants varied in length and ranged between five minutes to 30 minutes.

### Instrument

To ensure consistency across interviews, the research team developed a semi-structured interview guide to explore factors that influence the decision-making process (i.e., thoughts, feelings, and social processes) among hesitant adopters of the COVID-19 vaccine (see Table 1).

### Qualitative data analysis

The research staff transcribed all recorded interviews and field notes verbatim. De-identified transcripts were uploaded to MAXQDA 2020 for analysis.<sup>43</sup> Three researchers with qualitative expertise conducted content analysis by reviewing and manually coding the transcripts through careful reading and rereading of the interviews to interpret the meaning and assign labels to data segments with initial codes.<sup>44–46</sup> Emergent codes, which emerged from the data itself, were used to label initial data segments.<sup>46–48</sup> The first author conducted initial coding on five transcripts, labeled data segments with short summary codes to organize the data for more focused coding, and developed a preliminary codebook of these emergent codes. Two additional researchers conducted confirmation coding on the five transcripts. The research team reviewed the coded transcripts together and discussed any discrepancies in the interpretation of the data, and differences were resolved by consensus. The first author refined the preliminary codebook comprised of codes and their definitions, which served as a guide for coding the remaining 44 transcripts.<sup>49</sup> As new codes were identified in the transcripts, the first author added these codes and their definitions to the codebook, which was

**Table 1.** The semi-structured interview guide used to facilitate interviews with hesitant adopters about their vaccine decision-making process.

1. Can you describe your thought process as you made the decision to get the COVID-19 vaccine?
2. What were your main concerns about the COVID-19 vaccine?
  - o (Probe for risk, worry, trust, and safety concerns, but do not prime for those ideas.)
3. Did anything or anyone help you overcome your hesitancy? Who or what was it?
  - o (Probe – referring back to their answer for Q2 – for which, if any, concerns that fed into their hesitancy were overcome: risk, worry, trust, and safety concerns, but do not prime for those ideas.)
4. Did anyone in your life have an impact on your decision to get the vaccine? How so?
5. Did any factors make it more convenient to get the vaccine?
6. What is the main reason you got the vaccine?
  - o Any secondary reasons?

refined five times. We reviewed and re-coded all previously coded transcripts to ensure they reflected the revised and final codebook. To ensure analytic rigor and reliability, the research team critically reviewed the data, analysis summaries, codebook, and all coded segments.<sup>50</sup> The research team used the technique of constant comparison, an iterative process of comparing and contrasting each datum with all other data to gain conceptual understanding and identify categories and develop themes.<sup>46,51</sup>

The research team used constructs from the WHO's Determinants of Vaccine Hesitancy Matrix<sup>14,23</sup> to categorize the emergent codes and develop global themes related to factors influencing the decision-making process shared across all interviews transcripts. Analysis summaries and all coded segments were critically reviewed by the research team to ensure data, as well as illustrative excerpts from coded data, were extracted and categorized within the relevant thematic domain. Quotes were collated, and statements which best reflected emergent themes and strong patterns in the data were chosen by consensus among the research team<sup>52,53</sup> to ensure saturation, coherence, and reliability.<sup>54,55</sup> Although participants often expressed multiple codes within their responses, researchers categorized quotes within those themes they best represented. The most demonstrative quotes that describe and explain thematic domains and descriptive sociodemographic characteristics of the qualitative sample are presented below.

## Results

Descriptive statistics for participants' characteristics including demographic information (i.e., race and/or ethnicity, gender, age) and survey responses related to COVID-19 vaccine hesitancy, trust in vaccines, proportion of social network who is vaccinated, and political affiliation are presented in Table 2. The sample is diverse and representative of the national US population with an almost equal distribution of males (51.02%) and females (48.98%). The mean age of participants was approximately 45 years of age. The participants were diverse with most identifying as Black/African American (34.69%), White (24.49%), Asian American (18.37%), or Hispanic/Latino (16.33%); two (4.08%) identified as American Indian or Alaska Native, and one (2.04%) identified as Native Hawaiian or Pacific Islander. Most participants resided in the South (42.86%); however, the Northeast (24.49%), West (20.41%), and Midwest (12.24%) regions were each represented. Slightly more than half of the participants reported Democrat (58.33%) as their political affiliation; only 9 (22.92%) identified as Republican, and 11 (18.75%) reported Independent or Other for their political affiliation. Three quarters of participants reported having a bachelor's or graduate degree (75.51%), and most participants reported having health insurance (91.84%). Most participants reported their self-rated health as "very good" (40.82%) or "good" (26.53%). For level of hesitancy about getting a COVID-19 vaccine, there were 10 (20.41%) participants who reported being "very hesitant," 12 (24.49%) who reported being "somewhat hesitant," and 27 (55.10%) who reported being "a little hesitant." Most

participants (67.35%) reported they trusted the COVID-19 vaccine "somewhat," and half of participants (55.10%) said "many" of their social network were vaccinated against COVID-19.

## Qualitative results

All participants discussed factors influencing their decision to get the COVID-19 vaccine despite being hesitant. Those influences were organized into two primary themes adapted from Vaccine Hesitancy Matrix constructs: 1) sociocultural context and 2) individual and group influences.

### Sociocultural context

Participants in all interviews discussed influences related to sociocultural context. The research team identified four sub-themes within this primary theme: *political*, *cultural*, *health professionals*, *employment*, and *media environment* as factors influencing hesitant adopters' decision to get the COVID-19 vaccine.

**Political.** Participants discussed the influence of political affiliation and specific politicians when describing their decision-making process or their perceptions of other people's decision to get vaccinated. A participant described how specific politicians influenced her decision: "I felt like, 'Hey, if our President has taken it, and our Vice President has taken it, and these other people [politicians] they're not afraid of it. I don't see what my problem would be.'" (67 yr old, Black/African American Female). Another participant explained, "once President Biden took office and he took charge of everything I felt like I could trust the process and I could go ahead and get my vaccine." (35 yr old, Asian American Female).

Political influence was described by participants as creating skepticism about the COVID-19 vaccine. A participant said, "This vaccine came out of nowhere and it was under a Trump presidency so that kind of factored in that there was pressure from the government to just throw something out there and say that we did it and they didn't really. I did have a little bit of political hesitancy." (44 yr old, White Female). One participant summarized, "I didn't trust the Trump Administration so it's not trusting the political party that was in charge at the time that was a reason why I was [questioning] can I really believe if it's safe." (34 yr old, Black/African American Female). Another participant explained this extended to skepticism about COVID-19 and the government: "I think it's a really scary thing. It's almost like a plague. I don't believe that it happened naturally, and whatever it is, the government's not telling the half of the story to us." (51 yr old, White Female). Another participant described the political influence on vaccine hesitancy: "I think the government get involved so you feel a bit more hesitant because I think you're being pushed to take something [and] anytime you have government or media pushing you to do something there is always some skepticism." (52 yr old, Asian American Male).

**Cultural.** Other participants explained the influence of culture and popular culture in the decision-making process.

**Table 2.** Descriptive characteristics of hesitant adopters (n = 49).

|  | Freq. | Percent |
|--|-------|---------|
| <b>Hesitancy Level</b>                         |       |         |
| A little hesitant                              | 27    | 55.10   |
| Somewhat hesitant                              | 12    | 24.49   |
| Very hesitant                                  | 10    | 20.41   |
| <b>Age</b>                                     |       |         |
| 18-24  | 3     | 6.12    |
| 25-34  | 10    | 20.41   |
| 35-44  | 11    | 22.45   |
| 45-54  | 14    | 28.57   |
| 55-64  | 5     | 10.20   |
| 65+  | 6     | 12.24   |
| <b>Gender</b>                                  |       |         |
| Male   | 25    | 51.02   |
| Female   | 24    | 48.98   |
| <b>Race/Ethnicity</b>                          |       |         |
| Asian American                                 | 9     | 18.37   |
| Black/African American                         | 17    | 34.69   |
| Hispanic/Latino                                | 8     | 16.33   |
| AIAN   | 2     | 4.08    |
| NHPI   | 1     | 2.04    |
| White  | 12    | 24.49   |
| <b>Education</b>                               |       |         |
| HS or less                                     | 4     | 8.16    |
| Some college/no degree                         | 7     | 14.29   |
| Associate degree                               | 1     | 2.04    |
| Bachelor's or graduate degree                  | 37    | 75.51   |
| <b>Insurance Status</b>                        |       |         |
| Not insured                                    | 4     | 8.16    |
| Insured  | 45    | 91.84   |
| <b>Self-Rated Health</b>                       |       |         |
| Poor   | 1     | 2.04    |
| Fair   | 6     | 12.24   |
| Good   | 13    | 26.53   |
| Very good                                      | 20    | 40.82   |
| Excellent                                      | 9     | 18.37   |
| <b>Region</b>                                  |       |         |
| Northeast                                      | 12    | 24.49   |
| Midwest  | 6     | 12.24   |
| South  | 21    | 42.86   |
| West   | 10    | 20.41   |
| <b>Political Affiliation</b>                   |       |         |
| Democrat                                       | 28    | 58.33   |
| Independent or Other                           | 11    | 18.75   |
| Republican                                     | 9     | 22.92   |
| <b>Perceived Vaccination of Social Network</b> |       |         |
| Very few                                       | 2     | 4.08    |
| Some, not many                                 | 8     | 16.33   |
| Many   | 27    | 55.10   |
| Nearly all                                     | 12    | 24.49   |
| <b>COVID-19 Vaccine Trust</b>                  |       |         |
| Not at all                                     | 3     | 6.12    |
| Very little                                    | 2     | 4.08    |
| Somewhat                                       | 33    | 67.35   |
| Very much                                      | 11    | 22.45   |

Column percentages may not sum to 100 due to rounding. AIAN = American Indian or Alaska Native; NHPI = Native Hawaiian or Pacific Islander; HS = high school.

Participants described the importance of culturally relevant figures sharing information as an influence on their decision-making process, especially among Black/African American participants. A participant stated: "I'm specifically thinking about the black community, honestly, the thing they listened to the most is pop culture. Hearing artists, actors, and people that look like us that we can relate to, is often where we get our resources from. Even about news. We get news from people that look like us." (32 yr old, Black/African American Female). Another participant said cultural norms influenced her decision to get the COVID-19 vaccine after her mother requested

it. She explained, "I'm a Native American, we are a matrilineal tribe so it's part of our culture to obey the women older than us. She asked for something, and it was in my power to give it to her, which means culturally, I have to, or I'll embarrass my whole family." This participant went on to conclude, "I would have eventually probably gotten vaccinated if she hadn't asked me to, but her asking me to, I did it within 4 days." (47 yr old, American Indian or Alaska Native Female).

**Health professionals.** Participants discussed the influence of health professionals and medical research on their vaccine decision-making process. Participants overwhelmingly described health professionals as trusted sources of information about the COVID-19 vaccine and vaccination who were influential factors on their decision. A participant explained, "Listening to people like Dr. Fauci, the CDC. And listening to people who are respected in the medical community. So, listening to the experts. I'm sure these people are trustworthy; they're respected in the community." (67 yr old, Black/African American Female). Participants said primary care physicians were especially influential in the participant's decision-making process. One participant described: "I didn't have a choice because of my age and some preexisting medical conditions. I've had the same doctor for years, and I went for my regular checkup and the conversation started about the vaccine." The participant summarized, "I said to her, 'I wanted to discuss with you some of my concerns about the vaccine.' Her response to me was, 'It almost seems like this conversation leads me to believe you think you have a choice. You want to go Friday?' I said, 'Yeah, let's just get this over with.'" (48 yr old, Black/African American Male). Another participant said before they got the shot, "I needed to talk to my doctor and also my pharmacist about the safety of it." (69 yr old, American Indian or Alaska Native Female).

While most participants reported the encouraging influence of health professionals, others described how the history of mistreatment and medical racism can deter the decision to get a COVID-19 vaccine, especially among Black/African American participants. One participant explained Black/African Americans may be influenced by historical factors and fear of medical racism: "I think it has a lot of historical contexts of experimentation that were done on black people after slavery was over. People still hold on to that." This participant went on to explain how historical factors influence vaccines decisions: "A lot of the [social media] videos that I see are like, 'This is a great way for the government to poison us' or 'This is a great way for all these tests to be run on us' they don't have any actual research or facts to back it up. It's all opinion but it's just the stigma." (32 yr old, Black/African American Female). Another participant summarized, "So I know for African Americans they're a little bit hesitant with the history of black people being used as guinea pigs back in the days, so I just bit the bullets. I went." (34 yr old, Black/African American Female). Another participant discussed the Tuskegee research project as an influential factor on the decision to get the COVID-19 vaccine: "The government was experimenting on African Americans so I can understand why they would have that hesitancy, especially the older people



who had lived through that.” This participant explained, “They passed that story down to their kids and people don’t understand how much that affects people down the line, but I could understand that they have that little bit of hesitancy.” (55 yr old, Asian American Female).

**Employment.** Participants discussed employment as an influential factor in their vaccine decision-making process because either their employer required it, or they were in occupations with a higher risk for COVID-19 exposure. A participant summarized, “Hospital workers, police officers, anybody that has a lot of public contact, it’s been mandated that you get the vaccine, or you will not have a job.” (45 yr old, Native Hawaiian or Pacific Islander Male). Another participant said, “I didn’t want to get the vaccine at all, but I got a job at Hobby Lobby, and I’m exposed to the public, so I felt I had an obligation to do it.” (47 yr old, American Indian or Alaska Native Female). One participant said, “It was the idea of going back to work because I was working from home, and they were going to open up the schools and I had to go back to work, and I think that was more of an influence.” (77 yr old, African American Female). Another participant explained, “Then work also had said, ‘We’d really like all of you to please get shots so that we can bring you all back into work as well.’” (55 yr old, Asian American Female).

**Media environment.** Participants described how the media environment or media context in which vaccine information is shared and talked about influenced their decision-making process. Participants noted the way information about the COVID-19 pandemic and the COVID-19 vaccine was presented by the media influenced their decision to get vaccinated. One participant said, “my thinking is always changing based on the information available, and I was listening to the news and sometimes the information is not very straightforward.” (45 yr old, Asian American Male). Participants who discussed the role of media reported the media messaging and information about the pandemic and COVID-19 vaccine influenced their decision-making process. Another participant explained the media’s influence on their decision to get the COVID-19 vaccine: “What helped me is I watched a news program, I listen to Anderson Cooper, Don Lemon, Chris Cuomo, which is on CNN. Sometimes I’ll watch MSNBC. I try to listen to intelligent people. They’re not trying to negate the science. This is about being wise.” (67 yr old, Black/African American Female).

While participants discussed the influential role of media in their decisions, they also noted misinformation obtained through social media often discouraged the decision to get the COVID-19 vaccine. One participant said, “I know there’s been a big issue with misinformation on social media. A lot of people think it’s a hoax. They don’t believe it’s a true virus. They think it’s the government controls them, and it’s just based off of all the misinformation out there.” (45 yr old, Native Hawaiian or Pacific Islander Male). Another participant explained, “a lot of social media stuff was going on with people generating things that [the COVID-19 vaccine] is not good to take and the side effects were different [for Black/African Americans].” (53 yr old, Black/African American Male). One participant noted, “it would be internet stuff mostly and I don’t

know if you can tell if it’s credible, so I think a lot of times it was maybe internet talk that was scaring people.” (39 yr old, Black/African American Female).

### **Individual and group influences**

All participants described influences arising from personal perceptions of the COVID-19 vaccine as well as influences of their social network or peer environment on the decision to get vaccinated. The research team identified four subthemes: *attitudes and beliefs related to vaccines, family and social networks, free to return to normal*, and *COVID-19 outcomes* as factors influencing hesitant adopters’ decision to get the COVID-19 vaccine.

**Attitudes and beliefs related to vaccines.** Participants discussed how their personal attitudes and beliefs about vaccines influenced their decision-making process. Participants described their beliefs the vaccine would protect them and prevent serious illness while also helping to stop the spread of COVID-19 infection. One participant explained, “I don’t want to be ill, and I don’t want to give it to anybody.” (76 yr old, White Female). Participants with chronic conditions or increased risk also noted protection and prevention from serious illness influenced their decision-making process: “I had my 90-year-old mother who was pretty sick, and I was very concerned about exposing her, so that was the big influence, and the secondary was I was a smoker and I felt like if I got it, I was going to die, so I gave myself the best chance of survival.” (71 yr old, Black/African American Female). While another said, “The main motivation is really like for better protection, not just myself. I think, eventually, it will also protect other people, will stop this pandemic from going on.” (45 yr old, Asian American Male). One participant described, “I haven’t caught COVID-19 and other people are still catching COVID-19 because they are unvaccinated. Right now, it just seems like a better option to get vaccinated than to not be vaccinated.” (31 yr old, Black/African American Female).

Participants discussed previous vaccination experiences as influences on their decision to get the COVID-19 vaccine. A participant summarized:

I’ve been getting vaccines since I was little. I don’t really believe that they would give us something that was harmful or contained cameras or whatever, so, if nothing has gone wrong up to this point, I will take my medicine if this medicine is going to keep me from getting sick and dying, then I’m going to go ahead and do that. (44 yr old, Black/African American Female)

Another participant described their experience with flu vaccines: “I’ve gotten regular flu shots pretty much every year for quite a few years. So, I’ve been getting the flu shot regularly and I thought to myself, well, it’s probably not much different from that.” (65 yr old, White Female).

**Family and social networks.** Participants discussed how vaccinated family members or persons from their social networks influenced their decision to get the COVID-19 vaccine through sharing their experiences with vaccination. One participant explained, “Prior to me getting it, I did have some family members, they were older than me, receive the vaccine with

no issues. That's why my confidence level went up and I decided to get the vaccine." (45 yr old, Native Hawaiian or Pacific Islander Male). Another participant said, "I had a lot of friends that had gotten them. Stood in line to get them, which I wasn't going to do. I thought I'd give it a while to see what went on. Any of my friends that had the type that I ended up with, which was the Pfizer, I don't remember any of them having any strong ill effects." (70 yr old, White Female). A participant explained:

My parents are in their 70s now. They both got it pretty early on. My sister lives with them and she got it earlier too because she was able to get it when they opened up for educators. So, just hearing their experience helped me to decide to go ahead and do that as well. (41 yr old, Black/African American Female)

Participants provided examples of a shared decision-making process among family members and key friends who encouraged vaccination and sometimes even helped facilitate getting the shot. One participant said, "We talked as a family that if we don't get this vaccine and we're really not going to be able to share some of the moments that were used to doing. I think we made a decision as a family to do it, and that was a big part for me, the missing of interaction and my family." (53 yr old, Black/African American Male). Another participant noted, "I had a roommate [who] was very helpful, he took me to get my shot and talked to me all the way through it." (69 yr old, American Indian or Alaska Native Female). Participants also described social pressure from family members and friends when discussing influences on their decision to get the COVID-19 vaccine. One participant explained, "My kids, they did not get the vaccine. They were just totally against the vaccine and the other side [of my family] was just like, we're just going to get the vaccine to be safe. So, I was really pulled a lot about that vaccine." (71 yr old, Black/African American Female). Another participant said, "me and my son went together because I told him since [you have diabetes] you need to get signed up too because you have a preexisting condition, so we went together." (67 yr old, Black/African American Female).

**Free to return to normal.** Participants described wanting freedom to return to normal activities as an influential factor in their decision to get vaccinated. One participant said, "To be able to get back to normal in the community as well. I wanted to feel a sense of normalcy, okay, get the vaccine, and then I can go about my life, and that kind of took even that little bit of concern." (65 yr old, White Female). Another participant noted, "in order to participate now in a majority of thing in society, you just have to have a vaccine." (71 yr old, Black/African American Female). Participants said getting the vaccine would mean they could comfortably return to regular routines. A participant explained, "I just feel like I can do more now. I know it's not a hundred percent effective which nothing is going to be that way, but I just feel a little more comfortable doing more stuff. Because I was pretty isolated prior to getting the vaccine." (31 yr old, Black/African American Female). Another participant explained: "I was getting everything delivered. I wasn't going outside, but once I decided like, okay, I actually need to go outside, and be able

to take walks, and do different things because being in the house just didn't feel healthy. That's when I made the decision. (32 yr old, Black/African American Female).

**COVID-19 outcomes.** Participants discussed their knowledge and awareness of negative COVID-19 outcomes as an influence on their decision to get the COVID-19 vaccine. One participant stated, "I had a relative who got Covid, so that kind of pushed me to get the shot." That participant went on to explain, "My aunt, she passed away, she had some underlying conditions, but it just wiped her out." (56 yr old, White Female). Another participant noted, "seeing people that I knew were getting sick with Covid and I thought it would be better to have the vaccine." (41 yr old, Black/African American Female). A participant explained, "I think my mom, her realization came when people around her at work were getting sick. One person was hospitalized for a long period of time. I think that was a wake-up call for her." (32 yr old, Black/African American Female).

Other participants described seeing news reports and statistics related to COVID-19 mortality rates as influences on the decision to get the shot. A participant explained,

Looking at what was happening on TV where people were dying of COVID, it's horrible. I mean, young people and not just the elderly but people like in their 30s and 40s dying, so that was my thought process in the whole thing, and that's what influenced me by seeing other people going through this struggle. Going to the hospital, can't breathe. People, some of them had lung transplants. I mean, it's sad losing their limbs because they've been in there for months. I don't want that happening to me. (67 yr old, Black/African American Female)

Another participant said, "Statistics could be powerful for some people, [though] not all. I'm sure the number is much greater on people who suffered from COVID-19 than that of those who majorly suffered from the vaccines." (53 yr old, Black/African American Female).

## Discussion

This exploratory qualitative study documented multiple factors influencing the decision-making process to get the COVID-19 vaccine among a racially and ethnically diverse sample of hesitant adopters in the US. Participants described influences related to sociocultural context and personal and group influences, which affected their decision to get the COVID-19 vaccine despite being hesitant.

Participants described the political influence on the decision to get the COVID-19 vaccine. Hesitant adopters discussed how their decision to get vaccinated was influenced by their political affiliation and their trust or lack thereof in the president or government. Participants of all political affiliations described how their perceptions of who oversaw the governmental response to the COVID-19 pandemic were influential factors in their decision to get the COVID-19 vaccine. These findings are consistent with prior studies that documented factors including political affiliation, ideology, partisanship, and the level of trust in the government influencing Americans' decision-making process to get vaccinated against COVID-19.<sup>26–28,30</sup> This study adds important

insights by documenting the influence of political affiliation and trust in government among hesitant adopters in the US.

Participants described the influence of trusted messengers from popular culture and cultural leaders. This is the first qualitative study to document the influence of matrilineal decision makers within some cultures among hesitant adopters of the COVID-19 vaccine. Participants also discussed the influence of health professionals and medical research on the decision to get vaccinated. Prior literature has documented the importance of healthcare access and healthcare providers in the vaccine decision-making process.<sup>4,11,19,24</sup> These findings extend the literature to document the role healthcare providers play in the decision-making process among hesitant adopters. While participants described health professionals as trusted sources of information, they also discussed historical mistrust of doctors and a fear of medical racism that influences current vaccination among racial and/or ethnic communities. Prior research has established a link between distrust of the medical establishment, histories of racist exploitation, and direct experiences of racial discrimination with vaccine hesitancy.<sup>11,56</sup> Our findings continue to illuminate the long-term concerns that exploited populations have regarding medical research and vaccination, which could continue to perpetuate health disparities.

Employment was also a key influence participants described, including mandates and infection risks of their job, as a factor influencing the decision-making process, often encouraging them to get the COVID-19 vaccine despite their hesitancy. This is consistent with a limited body of quantitative research examining employment as an influence<sup>7</sup> and adds important nuanced knowledge about the influence of employment in participants' own words. Participants also discussed the influence of news media and social media on the decision to get the COVID-19 vaccine. These findings support prior research that reported news media and social media can have a myriad of influences on COVID-19 vaccine hesitancy.<sup>19,30,57</sup>

Participants described the influence of personal vaccine attitudes and beliefs, as well as the influence of their social network and peer environment on the decision-making process. Specifically, participants described how their prior experience with childhood and influenza vaccines influenced their decision to get the COVID-19 vaccine. This is consistent with a few quantitative studies<sup>7,58</sup> and, to the authors' knowledge, is the first qualitative study that allowed participants to describe the influence of prior vaccination in their own words. This extends the literature documenting how perceived level of risk against the safety and effectiveness of the available vaccine can influence the vaccine decision-making process.<sup>26,30,31</sup> Participants described family and social pressure they received regarding their vaccine decision, which is consistent with prior literature,<sup>29,30</sup> and our findings expand the literature by providing descriptions of family and social pressure from a diverse sample of hesitant adopters in their own words. Our findings support that vaccine attitudes can influence the decision to get vaccinated, and we document hesitant adopters' descriptions of shared decision-making with family and friends.

Participants described their desire to return to normal activities as an influential factor in their decision-making. Participants also discussed how being vaccinated would make

them feel comfortable returning to their pre-pandemic routines. Our findings are consistent with a previous qualitative study that found getting back to normal was a contributing factor for participants who were considering COVID-19 vaccination.<sup>30</sup> To our knowledge, this is the first qualitative study to document the return to normal as a factor influencing the decision to get a COVID-19 vaccine among a diverse sample of hesitant adopters in the US, and it provides further understanding of the influence to return to normal in participants' own words.

Participants discussed how the knowledge and awareness of negative COVID-19 outcomes, especially among family, friends, or coworkers, was an influence on their decision to get vaccinated. Participants also described media coverage of COVID-19 infections and deaths as an influence on their decision-making process. This is consistent with previous quantitative literature documenting the number of COVID-19 infections as a factor influencing participants' decision to get vaccinated.<sup>59</sup> Our findings expand the literature documenting the awareness of COVID-19 death rates as influential to vaccine acceptance<sup>4</sup> and provides important nuanced information about how awareness of negative COVID-19 outcomes influenced the decision-making process of a racially and ethnically diverse sample of hesitant adopters of the COVID-19 vaccine.

While previous studies have documented vaccine access barriers as influencing the decision-making process,<sup>28</sup> participants in this study did not describe vaccine access barriers or the timing of vaccine availability as an influence on the decision to get vaccinated. This may be explained by the timing of the study and demographics of the sample. We examined influences on the decision-making process among hesitant adopters after COVID-19 vaccines became more widely available and accessible. Most participants were insured (91.84%) and reported having a bachelor's or graduate degree (75.51%), which potentially reduced vaccine access barriers and, thus, were not factors influencing the decision-making process.

### Limitations

The study is not without limitations. Findings may not be generalizable to the US population as our sample size only included 49 people and the sample was more educated than the US population in general. While the first individuals to respond to the interview invitation were enrolled into study, most participants reported Democrat for their political affiliation which may limit generalizability. However, generalizability is not the main goal in qualitative exploration, and our findings provide an in-depth and nuanced understanding of the factors influencing the decision-making process among hesitant adopters of the COVID-19 vaccine. While the Vaccine Hesitancy Matrix provided a comprehensive framework for categorizing influences on the decision-making process, categories often overlap, and COVID-19 vaccine awareness and knowledge has changed over the course of the pandemic. Furthermore, the vaccine hesitancy matrix may have limitations when applied to a new vaccine against a new pathogen, which may mutate rapidly. All interviews were conducted using a videoconferencing platform and



telephone, which may lead to selection bias excluding participants who lacked those technologies or broadband access. The study is strengthened with a diverse sample that included participants of multiple racial and/or ethnic groups from across the US. We did not compare or quantify specific differences across age, race, or ethnicity, as the intent of the study was to describe common influences on the decision-making process among hesitant adopters. These findings document factors influencing hesitant adopters, which can inform future studies seeking generalizability, and future research should explore differences across age group or race and ethnicity to determine how to best tailor interventions for target populations.

## Conclusion

Our findings make a significant contribution by documenting factors influencing the decision-making process to get the COVID-19 vaccine among a diverse sample of hesitant adopters in the US. While the findings are consistent with prior literature, they provide nuanced and in-depth information from participants who identified as hesitant and received the COVID-19 vaccine. This study extends and expands on prior literature on COVID-19 vaccine hesitancy, especially among hesitant adopters, in a few ways. First, we add nuance to the role that political affiliation and trust in government affect vaccine attitudes. We expand current knowledge of the role of politics and government in the pandemic response, vaccine development and approval process, and vaccination campaigns and their effect on the vaccine decision-making process. Second, our findings expand understanding of the role of healthcare professionals in the vaccine decision-making process, especially in understanding this role through the lived experiences of hesitant adopters. Finally, we add understanding of the return to normal in the decision to become vaccinated for hesitant individuals. This study also contributes some novel findings. This is also the first study to document the role of matrilineal culture on vaccine decision-making process. Further, this is also the first study to explore the role of prior vaccination experiences in the decision to be vaccinated for COVID-19, highlighting possible links between past vaccination and perceptions of risk from the COVID-19 vaccine. Importantly, qualitative methods allowed hesitant adopters to describe their influence on their decision in their own words. Understanding both hesitancy and vaccination as processes, and as potentially overlapping, opens opportunities for revealing specific points for intervention in the decision-making process. These findings can also inform future interventions to increase vaccine uptake by targeting factors most likely to influence vaccine-seeking behavior among communities where COVID-19 vaccination hesitancy persists.

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