COVID-19 vaccination hesitancy in Hispanics and African-Americans: A review and recommendations for practice

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ABSTRACT

COVID-19 vaccines were approved for use in the general American public by late 2020 and early 2021. Media reports started highlighting COVID-19 vaccination hesitancy in racial and ethnic minorities. However, little is known about the extent of COVID-19 vaccination hesitancy in racial and ethnic minorities and whether there are unique sociodemographic and cognitive correlates associated with vaccine hesitancy. Thus, the purpose of this study was to review all nationwide studies on COVID-19 vaccine hesitancy among African-Americans and Hispanics (the largest minority groups in the U.S.). A comprehensive review of the published literature was conducted to search for national studies and a final pool of 13 studies (n = 107,841 participants) was included in this review. The overall pooled prevalence rate of COVID-19 vaccination hesitancy for adult Americans across all studies was 26.3% (95%CI = 17.3–36.4). In contrast, the overall pooled prevalence rate of COVID-19 vaccination hesitancy for African-Americans was 41.6% (95%CI = 34.4–48.9) and for Hispanics, it was 30.2% (95%CI = 23.2–37.7). The major predictors of vaccine hesitancy in African-Americans and Hispanics were: sociodemographic characteristics (e.g., age, gender, income, education, and household size); medical mistrust and history of racial discrimination; exposure to myths and misinformation, perceived risk of getting infected with COVID-19; beliefs about vaccines and past vaccine compliance, and concerns about the safety, efficacy, and side effects from the COVID-19 vaccines. Given the high COVID-19 vaccine hesitancy rates in racial/ethnic minorities and the unique factors associated with vaccine hesitancy in African-Americans and Hispanics, several clinic-based and community-oriented practice recommendations have been included in this article.

1. Introduction

Multiple COVID-19 vaccines have been approved for use in the general population in the United States since December 2020. Amidst the considerable enthusiasm and anticipation for the vaccine, reports of COVID-19 vaccination hesitancy were seen in scientific literature and media reports (Callaghan et al., 2020; Kearny et al., 2021; Hamel et al., 2020; Wan, 2020). Specifically, media reports highlighted the skepticism about COVID-19 vaccination in racial and ethnic minority populations (Kearny et al., 2021; Hamel et al., 2020; Wan, 2020). A few early studies examined the rates of COVID-19 vaccine hesitancy among racial and ethnic minorities (Wan, 2020; Woko et al., 2020; Bogart et al., 2021a; Gatwood et al., 2021). Most of these studies included regional or convenience samples, assessed few correlates of COVID-19 vaccination hesitancy, or studied the general American public with a few participants who identified themselves as racial and ethnic minorities (Woko et al., 2020; Bogart et al., 2021a, 2021b; Gatwood et al., 2021). Also, it is not well known if COVID-19 vaccination hesitancy in racial and ethnic minorities is a consistent finding across studies and if there are unique sociodemographic and cognitive correlates for COVID-19 vaccination hesitancy in these populations (Wan, 2020; Woko et al., 2020; Bogart et al., 2021a, 2021b; Gatwood et al., 2021). Thus, the purpose of this investigation was to review all the national studies on COVID-19 vaccination hesitancy and assess the prevalence and factors associated with COVID-19 vaccination hesitancy in Hispanics and African-Americans (two of the largest racial and ethnic minority groups in the U.S.).

2. Methods

Two independent investigators (JK and YM) conducted a review of studies published in the U.S. from Feb 2020–Feb 2021. PubMed, EBSCO Host, and Google Scholar were utilized to search for studies using the...
keywords such as “COVID-19”, “vaccination”, “vaccine”, “racial”; “ethnic”, “minorities”, “hesitancy”, “intention”. The sequence of keywords was changed in repeated searches to ensure that all the relevant studies were included. Additional hand searches were conducted to include articles that cited the initially selected pool of articles. Studies were included in this review if they assessed COVID-19 vaccination hesitancy rates among adult Americans (≥18 years of age), from national samples, and if sample sizes and hesitancy rates were reported for African-Americans (AAs) and Hispanics. Pooled prevalence for COVID-19 vaccination hesitancy rates from studies was estimated with 95% confidence intervals using random-effects modeling.

3. Results

A final pool of 13 studies was included in this review with 107,841 participants (Table 1) (Daly and Robinson, 2021; Fisher et al., 2020; Reiter et al., 2020; Malik et al., 2020; Carpio, 2020; Latkin et al., 2021a; Khubchandani et al., 2021; Ruiz and Bell, 2021; Gibson et al., 2021; Nguyen et al., 2021; Szilagyi et al., 2021). The sample size of the studies ranged from 672 to 73,560 adult Americans (average sample = 8295 per study). The overall pooled prevalence of COVID-19 vaccination hesitancy rates for adult Americans across all studies was 26.3% (95%CI = 17.3–36.4). In the final pool of 13 studies, a total of 6253 participants were AAs with a sample size ranging from 67 to 2179 AA participants across the studies (average sample of 481 AAs per study). Across all studies, the overall pooled prevalence of COVID-19 vaccination hesitancy rates for AAs was 41.6% (95%CI = 34.4–48.9). Similarly, in the final pool of 13 studies, a total of 8748 participants were Hispanics with sample sizes ranging from 68 to 3235 across the studies (average sample of 673 Hispanics per study). The overall pooled prevalence of COVID-19 vaccination hesitancy rates for Hispanics was 30.2% (95%CI = 23.2–37.7). The final pool of studies included in this review was carefully assessed to explore factors associated with or hypothesized as contributors towards COVID-19 vaccination hesitancy in AAs and Hispanics (Daly and Robinson, 2021; Fisher et al., 2020; Reiter et al., 2020; Malik et al., 2020; Carpio, 2020; Latkin et al., 2021a; Khubchandani et al., 2021; Ruiz and Bell, 2021; Gibson et al., 2021; Nguyen et al., 2021; Szilagyi et al., 2021). The factors associated with COVID-19 vaccination hesitancy that appeared in more than one study in the pool of studies reviewed were summarized with an agreement between the authors (Table 1). The major predictors of vaccine hesitancy in AA and Hispanics included: sociodemographic characteristics (e.g., younger age, female gender, lower-income/education, and larger household size); medical mistrust and history of racial discrimination; greater exposure to myths and misinformation; perceived risk of getting infected with COVID-19; past vaccine compliance and beliefs about vaccines; and concerns about the safety, efficacy, and side effects from the COVID-19 vaccines.

### Table 1

COVID-19 vaccination hesitancy rates among Hispanics and African-Americans.

| Author/Data Collection | Sample Size (n) | Overall Hesitancy Rate | Hispanic Hesitancy Rates | African-American Hesitancy Rates | Factors Related to COVID-19 Vaccination Hesitancy in Hispanics & African-Americans |
|------------------------|-----------------|------------------------|--------------------------|-------------------------------|--------------------------------------------------------------------------------|
| Daly et al. April 2020 (Daly and Robinson, 2021) | n = 7547 (AA = 917; H = 1345) | 18.5% | 20.5% | 30.1% | Younger age and female gender associated with high COVID vaccination hesitancy rates. |
| Fisher et al. April 2020 (Fisher et al., 2020) | n = 991 (AA = 119; H = 162) | 10.8% | 14.8% | 20.2% | Lower-income and education associated with higher mistrust and vaccination hesitancy. |
| Reiter et al. May 2020 (Reiter et al., 2020) | n = 2006 (AA = 240; H = 241) | 31% | 26% | 45% | Conservative political leaning and living in rural places linked with vaccine hesitancy. |
| Malik et al. May 2020 (Malik et al., 2020) | n = 672 (AA = 67; H = 68) | 33% | 32% | 60% | Antivaccine attitudes, beliefs, and emotions associated with higher vaccine hesitancy rates. |
| Carpio et al. May 2020 (Carpino, 2020) | n = 1000 (AA = 103; H = 125) | 19.5% | 22.8% | 41.8% | Having children at home or larger size of the household linked with higher hesitancy rates. |
| Latkin et al. May 2020 (Latkin et al., 2021a) | n = 1043 (AA = 111; H = 93) | 16.7% | 22.2% | 31.5% | Medical mistrust and lack of information on COVID vaccine linked to vaccine hesitancy. |
| Khubchandani et al. June 2020 (Khubchandani et al., 2021) | n = 1878 (AA = 214; H = 357) | 22% | 29% | 34% | Racial discrimination and past mistreatment linked with higher COVID vaccine hesitancy. |
| Ruiz et al. June 2020 (Ruiz and Bell, 2021) | n = 804 (AA = 87; H = 74) | 37.8% | 52.7% | 40.2% | Perceived barriers such as lack of time, costs, fear of getting sick associated with hesitancy. |
| Gibson et al. Sept 2020 (Gibson et al., 2021) | n = 1592 (AA = 410; H = 382) | 41.1% | 43.2% | 51.2% | Concerns about side effects, efficacy, and safety associated with higher hesitancy rates. |
| Nguyen et al. Sept 2020 (Nguyen et al., 2021) | n = 3541 (AA = 476; H = 469) | 38.1% | 36.4% | 56.1% | Concern about speedy development & politics associated with higher vaccine hesitancy rates. |
| Daly et al. Oct 2020 (Daly and Robinson, 2021) | n = 7547 (AA = 917; H = 1345) | 32% | 36.3% | 44.3% | Greater exposure to conspiracy theories/myths via media associated with higher hesitancy. |
| Szilagyi et al. Dec 2020 (Szilagyi et al., 2021) | n = 5660 (AA = 413; H = 810) | 43.8% | 47.3% | 61.4% | Higher perceived risk of COVID-19 infection associated with lower vaccine hesitancy rates. |
| Nguyen et al. January 2021 (Nguyen et al., 2021) | n = 73,560 (AA = 2179; H = 3235) | 8.5% | 15.6% | 28.0% | Healthcare providers’ recommendations are associated with lower vaccine hesitancy rates. |
| Pooled Estimates | N = 107,841 (AA = 6253; H = 8748) | 26.3% (95%CI = 17.3–36.4) | 30.2% (95%CI = 23.2–37.7) | 41.6% (95%CI = 34.4–48.9) | Being a frontline or healthcare worker may increase COVID vaccine uptake in AA and H. |

n = indicates sample size for each study. N = indicates the cumulative sample size for all studies. AA = sample size for African-Americans in each study. H = sample size for Hispanics in each study. Pooled estimates indicate random-effects modeling for overall and AA or H specific COVID-19 vaccination hesitancy rates. Studies are listed in chronological order based on when the data was collected for each study (in descending order).
4. Discussion

Our review of studies on COVID-19 vaccination hesitancy rates in the U.S. found that a little more than a fourth of the American adults were unwilling to obtain COVID-19 vaccines (26.3%). In contrast, when hesitancy rates were estimated for racial and ethnic minorities, 30.2% Hispanics and 41.6% African-Americans were unwilling or hesitant to obtain COVID-19 vaccines. The high prevalence of COVID-19 vaccination hesitancy in these groups is disconcerting for several reasons (Daly and Robinson, 2021; Fisher et al., 2020; Reiter et al., 2020; Malik et al., 2020; Carpiano, 2020; Latkin et al., 2021a; Khubchandani et al., 2021; Ruiz and Bell, 2021; Gibson et al., 2021; Nguyen et al., 2021; Szilagyi et al., 2021; Zelner et al., 2021; Karmakar et al., 2021; Gauthier et al., 2021; Brown, 2020; Hughes, 2021). First, the COVID-19 pandemic has disproportionately affected racial and ethnic minorities with a greater number of hospitalizations and deaths among these populations (Zelner et al., 2021; Karmakar et al., 2021). Second, even before the pandemic, the racial and ethnic health burden and poorer health outcomes were more prominent among minorities, not getting a COVID-19 vaccine may further increase the risk of morbidity and premature mortality in these populations (Karmakar et al., 2021; Gauthier et al., 2021). Third, racial and ethnic minorities are frequently engaged in low-wage and essential services with a risk of getting exposed to COVID-19 infections; vaccination should be a priority among these groups (Gauthier et al., 2021; Brown, 2020). Fourth, while many of the factors associated with vaccine hesitancy in AA and Hispanics (e.g., female gender, lower-income/education, etc.) have also been reported for Whites, the proportion of socially disadvantaged individuals is much higher among racial/ethnic minorities (Karmakar et al., 2021; Gauthier et al., 2021; Brown, 2020). Also, there could be a higher confluence of factors associated with COVID-19 vaccination hesitancy in racial/ethnic minorities with many of these factors existing even before the pandemic (e.g., lower education = vulnerability to myths and misinformation, lower income = greater perceived barriers for obtaining COVID-19 vaccines, neighborhood disadvantage = fewer opportunities to visit healthcare providers where vaccines can be recommended/ offered; greater experiences of discrimination = greater medical mistrust, etc.) (Bogart et al., 2021b; Latkin et al., 2021a; Khubchandani et al., 2021; Ruiz and Bell, 2021; Gibson et al., 2021). The multitude of factors may cause lower uptake of COVID-19 vaccines. Finally, recent reports have also suggested that majority-dominated socially deprived communities in the U.S. were not receiving proportionate allocations for COVID-19 vaccines or had lower coverage. Lower allocation or higher barriers (e.g., distance to vaccination sites, rurality, lack of facilities, digital divide, lower health literacy, etc.) are additional challenges in racial/ethnic minority communities that may impede mass vaccination with COVID-19 vaccines (Kearny et al., 2021; Hamel et al., 2020; Wan, 2020; Woko et al., 2020; Hughes, 2021; Recht and Weber, 2021; Latkin et al., 2021b). COVID-19 vaccination hesitancy should not and cannot be considered as a monolithic entity for any population subgroup or subcultures. Specifically, given the high rates of COVID-19 vaccination hesitancy, the multidimensional issues and challenges, and the unique reasons for vaccine hesitancy in Hispanics and AAs, communities must implement strategies to increase uptake of COVID-19 vaccines in AAs and Hispanics along with other racial/ethnic minorities. Based on the results of this study and a comprehensive literature review, the following list of recommendations should be adopted by healthcare facilities and clinicians, regional organizations and local leaders, health departments and public health professionals (Bogart et al., 2021a; Bogart et al., 2021b; Khubchandani et al., 2021; Latkin et al., 2021b; Momplaisir et al., 2021; Roy et al., 2020; National Academies of Sci, 2021; Bunch, 2021):

- Acknowledge hesitancy and explore the beliefs and attitudes of racial/ethnic minorities regarding COVID-19 vaccination hesitancy in respectful, sustained, and open communications.
- Understand mistrust that stems from knowledge of historical injustices and experiences of discrimination among minorities.

Simultaneously, encourage vaccination by using fact-based, non-confrontational, and non-judgmental communication avoiding any coercion or deception.
- Healthcare providers should continue to build trust in patient-provider relationships and recommend the COVID-19 vaccine to racial/ethnic minority patients in each encounter. Utilize every opportunity to address concerns related to COVID-19 vaccine safety and side effects.
- Healthcare providers should increase their knowledge and awareness on COVID-19 vaccines’ development process, efficacy, and efficiency to address concerns and answer any questions.
- Communities should ensure the collective employment of local role models, faith leaders, and social networks for minorities to deliver reliable and authentic information about the vaccines and to promote ownership of COVID-19 vaccination in racial/ethnic minority communities.
- Develop and implement multimodal (e.g., print and electronic media) culturally competent communication strategies across communities with emphasis on activities such as fact-finding, rumor control, dispelling of myths and misinformation, message monitoring, and frequent utilization of a variety of spokespersons, audio and visual public service announcements.
- Implement community and place-based approaches to ensure equitable COVID-19 vaccine access with fewer barriers (e.g., transportation, registration, digital divide, rurality, lack of healthcare facilities, etc.) for racial/ethnic minority populations to reach them where they are.
- Regional agencies should implement and continue community-based surveillance of vaccination rates among racial and ethnic minorities to monitor the uptake of COVID-19 vaccinations.
- Finally, racial and ethnic minority healthcare providers have a major role to play in: advocating for fair allocation of vaccines, role modeling by taking the vaccines, serving as trusted messengers, and emphasizing the benefits of vaccines with racial and ethnic minority patients.

The results of this review should be considered in light of potential limitations. The search terms and methods used to identify the final pool of studies may have led to the omission of some articles which may have introduced biases in our findings and assumptions. The overall rates of COVID-19 vaccination hesitancy in Hispanics and AAs were extracted from studies, but there could be substantial differences among these groups (e.g., based on age, education, occupation, etc.). Pooled estimates computed in this review may not appropriately represent COVID-19 vaccination hesitancy for a specific group of AAs or Hispanics. There was a large variation in the timing of data collection, nature of the study samples, and vaccination hesitancy across different studies included in this review. This heterogeneity may have limited accurate estimation of the overall COVID-19 vaccination hesitancy in AAs and Hispanics. Finally, across all the studies included in this review, the proportion of Hispanics (8748/107,841 = 8.11%) and AAs (6253/107,841 = 5.79%) was substantially lower than the actual proportion of Hispanics (>15%) and AAs (>10%) in the U.S. population (based on U.S. Census) limiting the generalizability of our findings and warranting additional studies with larger and more diverse samples of Hispanics and AAs across the U.S.

5. Conclusions

In this review of national studies on COVID-19 vaccination hesitancy, the overall rate of vaccine hesitancy in the general American public was found to be 26.3%. In contrast, the overall rate of COVID-19 vaccination hesitancy was higher for AAs (41.6%) and Hispanics (30.2%). Two major types of factors were found to be associated with COVID-19 vaccination hesitancy in AAs and Hispanics (i.e., sociodemographic characteristics and cognitive correlates). It appears that COVID-19 vaccination hesitancy...
in racial/ethnic minority populations is not a monolithic concept. Given the multifactorial origin of lower COVID-19 vaccination rates in racial/ethnic minorities, multipronged individual and population-based interventions should be implemented to increase vaccine uptake among minority and socially disadvantaged populations. Unless a proactive approach is adopted, COVID-19 vaccination rates in certain populations will continue to remain lower than what is desirable.

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Author contributions
Both the authors contributed equally to the paper and author names appear in alphabetical order.

Declaration of competing interest
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