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## RESEARCH NOTES

## Exploring COVID-19 vaccine hesitancy at a rural historically black college and university

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## ABSTRACT

**Objectives:** Minorities have been disproportionately affected by the coronavirus disease 2019 (COVID-19) yet have the lowest COVID-19 vaccine rate. Vaccine hesitancy has been reported at higher rates in African Americans (AAs) and young adults. This study aimed to assess COVID-19 vaccine hesitancy, determine the rationale for receiving or declining the COVID-19 vaccine, and propose strategies to address confidence in faculty, staff, and students at a rural historically black college and university (HBCU).

**Methods:** A study was conducted using an electronic survey administered to a convenient sample of 210 faculty, students, and staff at the University of Maryland Eastern Shore, an HBCU in a rural community.

**Results:** Most participants were 18 to 24 years old (69%), college students (73.89%), AA (70%), and identified as a woman (70%). Notably, 87% of participants were nonhesitant (received one dose or intended to be vaccinated). Approximately 54% had already received at least one dose of a COVID-19 vaccine. Only 13% of participants were hesitant and did not plan to receive the COVID-19 vaccine. The most common rationale for vaccine hesitancy was mistrust of the health care system or government toward AAs.

**Conclusion:** The results show that vaccine hesitancy was low in the predominantly young-adult AA population at a rural HBCU. However, opportunities exist for pharmacists and other accessible health care professionals to contribute to efforts aimed at decreasing vaccine hesitancy and improving vaccine confidence.

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## Background

The coronavirus disease 2019 (COVID-19) pandemic has resulted in unprecedented challenges to public health.<sup>1</sup> Existing systemic and social inequities have resulted in a disproportionately increased risk of COVID-19 for rural communities, African Americans (AAs), and other minorities.<sup>1–3</sup> A systematic review found that AAs have higher rates of infection, hospitalization, and COVID-19-related mortality than their white counterparts.<sup>4</sup> Despite this disproportionality, COVID-19 vaccination rates for

some minority groups are low.<sup>5</sup> As of April 15, 2021, 16.7% of whites, 11% of Asians, 8% of Hispanics, and 9.9% of AAs were fully vaccinated in the United States.<sup>5</sup> Vaccine hesitancy, defined as a delay in acceptance or refusal of vaccination despite the availability of vaccination services,<sup>6</sup> is a potential reason for the discrepancy. A systematic review reported that the COVID-19 pooled prevalence rate of vaccine hesitancy rate was higher in AAs (41.6%) than all American adults (26.3%).<sup>7</sup> This is consistent with published literature demonstrating greater vaccine hesitancy in minority populations.<sup>8–10</sup>

One reason for the vaccine hesitancy in AAs may be medical mistrust. Mistrust refers to the idea that the entity that is the object of mistrust is acting against one's best interest or well-being.<sup>11</sup> In AAs, medical mistrust stems from a long history of injustices from the medical community. These include involuntary medical experimentation in slaves and the 40-year Tuskegee experiment in which the U.S. Public Health Service withheld treatment from black men to observe long-term

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effects of syphilis.<sup>11,12</sup> Although explicit medical injustices are no longer prevalent, AAs are still more reluctant to trust medical researchers than white adults.<sup>13</sup> Per a recent Pew Research Center survey, only 35% of AAs have “a great deal of confidence in medical scientists to act in the public interest” versus 43% of white adults.<sup>13</sup> Likewise, 61% of AAs have a positive view of medical doctors versus 75% of white adults.<sup>13</sup> Continued efforts to address mistrust in the AAs may significantly improve their confidence in medicine, including the COVID-19 vaccine.

The University of Maryland Eastern Shore (UMES) is a historically black college and university (HBCU), with 5 health professions programs including pharmacy and physician assistant (PA). Pharmacists and student pharmacists have led testing and vaccinations at UMES and in the surrounding communities. Likewise, PAs have been on the frontline as health care providers. Emerging health care professionals must understand vaccine hesitancy in their communities and barriers to health care. Pharmacists and PAs are accessible and poised to make an impact in their communities. UMES is located on the Eastern Shore of Maryland within one of the state’s 18 rural counties. Accessibility is a major barrier to health care in these rural communities.<sup>14</sup> Based on the demographics and the geographic location of UMES, the investigators sought to explore the extent of vaccine hesitancy and the rationale for choosing or refusing vaccination.

## Objectives

The primary objective of this study was to examine COVID-19 vaccine hesitancy in faculty, staff, and students at a rural HBCU. Researchers also wanted to determine the rationale for receiving or declining the COVID-19 vaccine and propose strategies to address vaccine confidence among students, faculty, and staff.

## Methods

Doctor of Pharmacy and Master of Medical Science in PA Studies students surveyed participants in person during 3 mandatory COVID-19 testing days on campus, which were chosen for convenient sampling. The inclusion criteria were all faculty, students, and staff who were 18 years or older and on campus during the COVID-19 testing days. The exclusion criteria included not consenting to participate or not meeting the inclusion criteria. Institutional review board approval was received from UMES, and an informed written consent was obtained from participants. Participants could complete the survey via an iPad provided by the student volunteers or by using a quick response code and completing it on their device. COVID-19 safety precautions were implemented throughout this study including social distancing, utilization of masks, and sanitation of the equipment before and after use.

**Table 1**  
Demographics of nonhesitant vs. hesitant participants

Variable	Nonhesitant n = 177 (87)	Hesitant n = 26 (13)	P value
Age group			0.180
18–24	120 (67.80)	21 (81)	
>25	56 (31.64)	5 (19.2)	
Prefer not to answer	1 (0.56)	0 (0)	
Gender identity			0.494
Woman	88 (49.71) <sup>a</sup>	11 (42)	
Man	82 (46.33)	(54)	
Genderqueer/gender nonconforming	1 (0.56)	1 (4)	
Trans man	1 (.56)	0 (0)	
Different identity not listed	2 (1.13)	0 (0)	
No response	3 (1.69)	0 (0)	
Racial or ethnic heritage			0.779
Black, Afro-Caribbean, or African American	121 (68)	21 (81)	
White/Caucasian	25 (14.12)	2 (7.69)	
Asian	11 (6.21)	0 (0)	
Latinx or Hispanic American	2 (1.13)	2 (1.13)	
Middle eastern or Arab American	2 (1.13)	0 (0)	
Multiple races	12 (6.78)	3 (11.54)	
Prefer not to answer	4 (3.42)	0 (0)	
Primary role at the university			0.936
Faculty	14 (7.91)	1 (3.85)	
Staff	23 (13)	2 (7.69)	
Student	128 (72.32)	22 (84.62)	
Health care professional/faculty	2 (1.13)	0 (0)	
Student/staff	6 (3.39)	1 (3.85)	
Student/health care professional	2 (1.13)	0 (0)	
Student/faculty	1 (.56)	0 (0)	
Staff/faculty	1 (.56)	0 (0)	
Highest level of education			0.130
High school	31 (17.51) <sup>b</sup>	9 (34.62)	
College	113 (63.84)	13 (50)	
Graduate school	31 (17.51)	4 (15.38)	
No response	2 (1.13)	2 (7.69)	

Note: Values are n (%).

<sup>a</sup> n = 174 for nonhesitancy group.

<sup>b</sup> n = 175 for nonhesitancy group.

The study occurred during phase 3 of Maryland's vaccine rollout, which allowed all individuals at the age of 16 years and older to be vaccinated.<sup>15</sup> Data collection occurred from April 15 to May 6, 2021. The university system announced on April 23, 2021 (a week after data collection began) that the COVID-19 vaccine would be required for the fall semester of the next academic year.<sup>16</sup> However, no specific guidance (e.g., procedures, process, timelines) was initiated by the conclusion of the data collection period on May 6, 2021.

Google Forms was used as the survey tool. The survey questions were developed using the knowledge and experience of the investigators. They consisted of multiple-choice and open-ended questions with free-text format. Demographics data such as age, level of education, biological sex, gender identity, racial or ethnic heritage, and role at the institution were collected. Participants were also asked about their rationale for receiving or refusing the vaccine and what could change their minds to receive the vaccine if they were not planning to be vaccinated. A faculty investigator reviewed open-ended questions with the free-text format (e.g., rationale for being vaccinated) and grouped similar answers. A second faculty reviewed the categories identified by the first faculty for accuracy.

To determine hesitancy or nonhesitancy, participants were asked about their current vaccination status and whether or not they intended to receive the vaccine when it became available to them. The nonhesitant group included individuals who answered "Yes" to either of the following 2 questions: "Have you received one or more doses of the COVID-19 vaccine?" and "Will you receive the vaccine when it becomes available to you?" The hesitant group included individuals who answered "No" to both aforementioned questions. The Pearson chi-square test was used to determine differences between demographic variables for the nonhesitant and hesitant groups. The alpha was set at 0.05.

## Results

A total of 210 individuals accessed the survey, and 205 completed the survey (98% response rate). Two participants below the age of 18 years were excluded, resulting in 203 surveys being analyzed. Demographics of participants are presented in Table 1. Approximately 69% of participants were between the ages of 18 and 24 years, 49% identified as a woman, and 70% were AA; 74% had a role of students only and 79% selected college or graduate school as their highest level of education. The groups were similar in all categories ( $P > 0.05$ ). Notably, 87% of participants were nonhesitant (received one dose of a COVID-19 vaccine or intended to be vaccinated in the future); 54% of the nonhesitant population had already received at least one dose of the vaccine. The most common reason for nonhesitancy (Table 2) was a desire to protect themselves, family, or community from COVID-19 (45%), followed by work/school requirements (22%). Some individuals misunderstood the question about vaccination status and entered vaccine type or the date that they received vaccination. Those responses were coded as invalid (16%). Only 13% of the population expressed vaccine hesitancy (had not received any doses of vaccines and did not intend to be vaccinated). The most common reasons for vaccine hesitancy were mistrust of the health care system (19%), concerns about timeline/research related to vaccine approval (15%), and lack of

**Table 2**

Reasons for vaccine nonhesitancy and hesitancy

Reasons for nonhesitancy (n = 177)	
Protection for self/family/community	80 (45.19)
Work/school requirement	38 (21.46)
Invalid response/no response	29 (16.38)/13 (7.34)
Travel	7 (3.95)
Limit mask wearing	5 (2.82)
Health care professional	3 (1.69)
No specific reason	2 (1.12)
Reasons for hesitancy (n = 26)	
Mistrust of the health care system	5 (19.23)
Concerns with FDA approval timeline/ concerned with speed/research of vaccine development	4 (15.38)
Lack of information	4 (15.38)
Confident with current state of health	3 (11.53)
Fear	2 (7.69)
Religious beliefs	2 (7.69)
Unsure	2 (7.69)
No response	2 (7.69)
Previous adverse reactions to other vaccines	1 (3.84)
Community/family influence	1 (3.84)

Abbreviation used: FDA, Food and Drug Administration.

Note: Values are n (%).

information (15%). Of the 24 participants who responded to the question "If you do not plan to receive the vaccine, what would make you change your mind?," the most common responses were nothing would change my mind (25%), mandates (25%), and more time/research (21%). In addition, approximately 61% of participants responded "Yes" to the question "Is COVID-19 vaccination required at your institution?" There was no statistically significant difference between the hesitant and nonhesitant groups regarding their answer to this question ( $P = 0.589$ ).

## Discussion

Among 203 young-adult AA population at an HBCU in the study, only 13% expressed vaccine hesitancy. The top reasons for hesitancy in this study included mistrust in the health care system (19.23%), concerns with Food and Drug Administration approval timeline/concerned with speed/research of vaccine development (15.38%), lack of information (15.38%), and confidence with current health (11.53%). The most common reason for nonhesitancy provided by the 87% of participants who were already vaccinated or intended to be vaccinated was a desire to protect self or others and that it was a requirement by work or school.

The data in this study show lower vaccine hesitancy (13%) than reported in a published systematic review of 13 studies on COVID-19 vaccine hesitancy, which reported a COVID-19 hesitancy pooled prevalence rate of 41.6% in AAs. The reasons for vaccine hesitancy in the present study included medical mistrust, perceived low risk of getting infected with COVID-19 due to current health status, and concerns about COVID-19 vaccine efficacy and safety, which were similar to those noted in a published review.<sup>7</sup> Nonhesitancy was 87% in the present study. This rate is higher than what was reported in the Centers for Disease Control and Prevention (CDC) study where 51.8% of adults at the age of 18 to 39 years were vaccinated or intended to be.<sup>17</sup> Similar to the CDC study,<sup>17</sup> a desire to protect self and others was a motivator for

vaccination in the present study. Although the intent to be vaccinated has been reported as being lower in young adults,<sup>18</sup> that was not the case for this study because ~68% of the nonhesitancy group were between the ages of 18 and 24 years.

Several factors potentially contributed to the low vaccine hesitancy in this study. First, pharmacy faculty and students played a key role in COVID-19 testing/vaccinations on campus and in the community. This may have helped to build trust among the university community. According to Riley and colleagues,<sup>19</sup> pharmacy faculty and student pharmacists from minority groups can be an important link between public health officials and their communities to provide information and build trust. This is important because mistrust of the government, concerns about efficacy/safety of the vaccine, and lack of information were among the most common reasons for hesitancy in this study. Notably, 4% of hesitant participants in the present study stated that encouragement from trusted individuals would change their minds about being vaccinated. This presents an opportunity for health care professionals in local communities with ongoing relationships with minority patients to educate and encourage them to be vaccinated. Second, Maryland has had an effective vaccination effort. Approximately 41% of the state's population had received at least one dose of the vaccine at the time of the study.<sup>20</sup> As more of the population is vaccinated and infection rates decline, individuals may become more confident in the efficacy and safety of the vaccine. As noted by the CDC, "Strong confidence in the vaccines within communities leads to more people getting vaccinated, which leads to fewer COVID-19 illnesses, hospitalizations, and deaths."<sup>21</sup> Another contributing factor could be that the university system announced that they would require vaccination for university employees for the next academic year. However, at the time of the present study, no specific policies had been disseminated/initiated. Although the university vaccine requirement was listed as one of the top reasons individuals had been vaccinated or intended to be vaccinated, only 61% of the nonhesitant population reported awareness of the university vaccine requirement for the upcoming academic year. Universities and other employers should make requirements clear to all their constituents by developing organizational-level strategies, including clinician recommendations and educational materials.<sup>22</sup> Another factor that could account for low vaccine hesitancy in the present study is educational level. Approximately 82% of the nonhesitant group indicated college degree or higher as their highest level of education. This is consistent with a report showing that those with higher levels of education are more likely to be vaccinated or plan to be vaccinated.<sup>18</sup>

Although vaccine hesitancy in the population of the present study was low, vaccine hesitancy continues to undermine vaccine campaigns within the United States and globally.<sup>22</sup> Public health officials have tried to promote the importance of mass vaccinations to slow the global pandemic; however, most vaccine campaigns have not specifically addressed hesitancy concerns within various populations.<sup>23</sup> Several international groups have published guidelines and strategies to combat vaccine hesitancy including audience targeting, barrier analysis, community engagement, marketing and promotion, outreach, and digital media.<sup>23,24</sup> For the predominantly AA young-adult population in this study, priority strategies are related to the most common reasons for hesitancy, which can be addressed

through education. Pharmacists and PAs are among the most accessible health care professionals in their communities and can play a crucial role in patient education. This is especially important in rural and underserved communities where access to care is challenging.

To address mistrust in the AA population, both information and empathy are important. It is necessary to determine individual concerns and respond to them in a culturally competent manner, rather than arguing with patients about vaccination.<sup>25</sup> In the present study, among hesitant individuals, a possible motivator for getting the vaccine was encouragement from a trusted individual. Because individuals distrust the motives and policies of institutions, not the individuals who work there,<sup>25</sup> this creates opportunities for trusted individuals such as minority health care professionals to educate and encourage AA young adults in their communities to be vaccinated.<sup>19</sup> Working with community organizations to reach out and empower patients through education and resources is another potentially impactful strategy to build trust and increase vaccine confidence.<sup>25</sup> Successful models of community-based approaches for health-related outreach in minority communities can be employed.<sup>26</sup> Although the U.S. health care system has made some strides in improving trust with AAs, there is still work to be done. Racial bias exists among health care professionals and can negatively affect patient outcomes.<sup>27,28</sup> Creating educational and training programs focused on addressing social determinants of health, racial bias, and stigma affecting health care is a way to improve trust and ultimately vaccine confidence in this population.<sup>25,29</sup>

The use of digital platforms to provide targeted messaging about the COVID-19 vaccine may be a particularly impactful strategy to improve vaccine confidence in the AA young-adult population. Approximately 15% of the hesitant population in this study cited a lack of information as a reason for hesitancy. Social media platforms serve as a primary source of information for a growing number of people.<sup>24</sup> However, they abound with misinformation about the COVID-19 vaccine.<sup>24</sup> Messaging aimed at correcting misinformation on Instagram, YouTube, and TikTok and promoting vaccine confidence may help combat vaccine hesitancy in the young-adult AA population.

There are several limitations to this study. First, the vaccine hesitancy group ( $n = 26$ ) was small, thus limiting the external validity of the study. The study population was predominantly 18 to 24 years of age, so the results may not apply to other age groups. Another potential limitation is that the survey tool was not yet validated. It was developed based on the investigators' experience and was pilot tested among the investigators, but not with an external group before it was launched. As a result, some survey questions may have been misinterpreted. For example, some participants answered the question about educational levels as the highest level of education in progress instead of the highest level of education completed. The educational level of our population may have affected the results. College or graduate school was the highest level of education for 79% of the population in the present study. This is higher educational attainment than average for all races in the United States.<sup>30</sup> Because individuals with higher levels of education are more likely to be vaccinated or plan to be vaccinated,<sup>18</sup> these data may not be reflective of a less educated population. Finally, the study was on campus during a time when teleworking was heavily used by the employees.

Individuals on campus may have been more willing to be vaccinated as opposed to those who were teleworking because of the pandemic. In addition, participants with vaccine hesitancy may not have been interested in completing the survey.

## Conclusion

This study shows low vaccine hesitancy in a predominantly young-adult AA population at a rural HBCU. However, there is an opportunity for pharmacists and PAs to partner with public health departments to implement strategies to decrease vaccine hesitancy and improve vaccine confidence in the AA populations nationally.

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