




Motivators and Barriers to COVID-19 Research Participation at the Onset of the COVID-19 Pandemic in Black Communities in the USA: an Exploratory Study

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Abstract

Introduction Black individuals in the USA continue to be underrepresented in clinical trials with low participation rates in COVID-19 research studies. Identifying participation barriers is necessary as we develop more vaccines and other treatments to address SARS-CoV-2 and associated sequelae. The purpose of this explorative, qualitative study is to apply the theory of planned behavior to understand motivators and barriers to COVID-19 research participation at the early stages of the COVID-19 pandemic. Understanding these factors is important to ultimately lead to increased vaccination rates among Black individuals, especially in strategies that increase preparedness in response to public health emergencies.

Methods A phenomenological qualitative study design was conducted between May and September 2020 among 62 Black participants. The participants were purposefully selected from vulnerable subgroups of the Black population: essential workers, young adults, parents, and individuals with underlying medical conditions. An inductive-deductive content analysis approach was used to analyze the interview data.

Results Majority (54.8%) reported willingness to participate in COVID-19 research. The following themes emerged from the interviews: (1) positivity toward research exists yet fear and distrust remain; (2) views toward COVID-19 research vary; (3) motivators to COVID-19 research participation; (4) barriers to COVID-19 research participation; and (5) potential strategies to increase COVID-19 research participation.

Conclusions Based on our findings, majority of the participants reported willingness to participate in research with observational research being the most commonly cited type of research. Providing data on the attitudes and perspectives of Black individuals and their intentions for COVID-19 research participation using TPB informs intervention targets for healthcare providers and policy makers for an equitable emergency response. Our results suggest improved communication on the research process, research opportunities, and participant testimonial through trusted sources could increase the likelihood of participation. This is especially important as we continue through the pandemic and new treatments for COVID-19 vaccines become readily available.

Keywords COVID-19 · Vaccination · Research participation · Theory of planned behavior

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Introduction

The global crisis caused by the coronavirus disease 2019 (COVID-19) pandemic has affected every country in the world. The USA, however, has steadily experienced the highest incidence and mortality rates associated with COVID-19. As a result, COVID-19 exacerbated the underlying social and economic health inequities within the USA. Since the beginning of the pandemic in 2020, federal, state, and local data have shown that low-income and racial/ethnic minority populations disproportionately bore the brunt of the morbidities and mortalities due to COVID-19 [1]. More than 2 years later, this trend has continued due to the emergence of several SARS-CoV-2 variants [2] and low vaccination rates. The incidence rates for COVID-19 have been two times higher, and mortality rates almost three times higher in Black Americans compared to White Americans [3]. Over time, cumulative data has shown persisting disparities in COVID-19 deaths for Black people, particularly in rural areas [4]. Preventative strategies are urgently needed to be implemented to reduce the disproportionate transmission, health complications, and mortalities associated with this ongoing pandemic, particularly among Black individuals.

To be most effective at achieving positive health outcomes for all, research should mirror the population most affected by the disease [5]. The race toward a COVID-19 vaccine, however, highlighted the lack of representation of Black Americans in clinical trials, both in enrollment and outreach at the onset. Black Americans make up 13% of the US population but accounted for 21% of COVID-19 deaths, but only 3% of enrollees in vaccine trials [6]. Efforts were implemented to increase participation of underrepresented groups such that in the phase 2/3 testing of Pfizer's COVID-19 BNT162b2 vaccine, the safety population included 9.1% Black or African American compared to 83.1% White [7]. Moderna's mRNA-1273 vaccine reported 10.2% Black or African American participants compared to 79.2% White [8], although both contained a smaller percentage of Black participants relative to the 13% of the US population. For any disease, low enrollment rates in clinical trials correlate with limitations in generalizability in findings, minimizing the development and/or improvement in drugs and treatments and, ultimately, positive outcomes [9]. While there are several efforts at increasing recruitment of Black participants in clinical trials, barriers to participation persist and need to be better understood.

For Black Americans especially, barriers to clinical trial participation exist on many levels and vary in complexity [10–12]. At the individual level, major obstacles include a lack of information about various types of

research opportunities (surveys vs. clinical trials), fear of the research process, and logistical barriers (e.g., issues of transportation, availability of childcare) that can result in problems with longitudinal retention. At the community level, mistrust of academic and research entities is the most significant attitudinal barrier to participation reported [12, 13]. Identifying barriers to participation specific to COVID-19-related clinical trials is necessary for researchers across the translational research continuum (from bench to bedside, then to the community) as we learn more about the evolution of the virus, and the vaccines, antivirals, and other treatments. Furthermore, this knowledge lays the foundation to understand how to inform and engage Black individuals in research overall, and more importantly aid in the event of future pandemics.

Theoretical Framework

The theory of planned behavior (TPB) has been extensively applied by researchers to understand individuals' beliefs and reasons for performing a specific behavior [14, 15] including research participation [16]. According to the TPB, an individual's intention to perform a behavior is the best predictor of performing a behavior. There are several factors that influence an individuals' intentions to participate in COVID-19 research: (a) socio-demographics; (b) beliefs about a COVID-19 research and associated consequences (i.e., attitude); (c) beliefs about normative expectation of others to engage in COVID-19 research and likelihood to comply (i.e., subjective norms); and (d) beliefs about the factors that facilitate or hinder performance in COVID-19 research (i.e., self-efficacy) [14]. Several studies used the TPB to understand intentions and behaviors related to COVID-19 prevention including social distancing, PCR testing, compliance with health protocols, and vaccine uptake [17–20]. However, no studies to our knowledge have applied the TPB to explore intentions and actual COVID-19 research participation. Hence, application of TPB will allow us to better understand the rationale and decision-making process for COVID-19 research participation among Black Americans.

The purpose of this study is to apply the theory of planned behavior to understand motivators and barriers to COVID-19 research participation and how they differ across the study at the initial stages of the COVID-19 pandemic. These results will serve to better inform the development of new strategies aimed at increasing research participation among Black Americans in high-risk subgroups. Findings from this study can be incorporated into recruitment strategies across the translational continuum.

Methods

Study Design

A phenomenological, qualitative study design was chosen to explore motivators and barriers to COVID-19 research participation among Black individuals living in the USA at the early stages of the COVID-19 pandemic [21]. We conducted semi-structured interviews among Black individuals who identified as essential workers, young adults, parents, or individuals with underlying medical conditions (UMC), uniquely vulnerable subgroups. This study was approved by Meharry Medical College Institutional Review Board (IRB).

Sampling and Recruitment

A purposive, criterion sampling method [21] was used to recruit participants using existing databases of past research participants, word of mouth, and social media. The participants were formally recruited via telephone and email where they were given information on the goals of the study and their rights as participants, and agreed then subsequently provided informed consent. These methods were chosen to achieve diversity and navigate pandemic restrictions on social gatherings and mobility. The inclusion criteria for the participants were (1) Black, (2) English-speaking, (3) aged 18 and over, and (4) a member of one of the following categories: an essential worker, a parent, a young adult (aged 18–35), or an individual with UMC.

Interview Protocol and Training of Facilitators

The interview guide was developed to seek views of research participation both generally and specific to COVID-19, and types of research (clinical trials, such as treatment and prevention trials, compared to observational research including surveys and interviews), along with motivators and barriers to participation (Table 1). Each question in the questionnaire tied with components of the TPB, i.e., their attitude toward research generally (“What are your overall views of research?”), subjective norms (social approval or disapproval) of participating in research (“What do you know of COVID-19 research?” and “What do you perceive are the benefits of COVID-19 research?”), and perceived behavioral control and barriers (“Why would you/would you not participate in COVID-19 research?”). Three medical students were trained to assist in conducting the study prior to initiation. Training included (1) a 1-h training session on qualitative research; (2) a 1-h training session on how to conduct interviews (i.e., reflective techniques to encourage discussion); and (3) a 1-h training session on how to use REDCap [22], a secure web application for building and managing online surveys and databases, to obtain sociodemographic information.

Procedures

Data collection took place between May and September 2020. Three medical students and two researchers conducted the interviews. Prior to the interview, the participants were sent a link using REDCAP [22], and, on the day of the interview, the participants were read an information sheet

Table 1 Interview protocol questions

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1. What are your overall views toward research? (attitudes)
 2. What do you know about COVID-19 research and your overall view of it? (modifying factor)
 - a. Can you elaborate more on...?
 3. Why would you/would you not [choose one based on the screening eligibility form] participate in research about COVID-19?
 - a. Unaware of research opportunities
 - b. Lack of access to research opportunities
 - c. Lack of trust in physician
 - d. Lack of trust in a pharmaceutical company
 - e. Family/friend/physician/significant other influence (subjective norms)
 - f. Concerns about research (long-term effects, use of data)
 - g. Cultural experience
 - h. Type of clinical trials (i.e., treatments and prevention trials) versus observational research (i.e., surveys, interviews)
 - i. Prior research experiences
 - j. Other: Are there other reasons you would or would not participate in research that we have not discussed?
 4. What do you perceive are the benefits of COVID-19 research? (motivators)
 - a. SARS-CoV-2 and COVID-19 prevention
 - b. End pandemic
 - c. Please explain more on _____
 - d. Could you please provide an example of _____?
 - e. Why do you think so?
-

and provided verbal consent to participate. The interviews lasted between 45 and 90 min, depending on the amount of information the participant provided. The participants were compensated a \$30 electronic gift card. All interviews were audio-recorded and transcribed verbatim using Zoom and verified by the members of the research team to ensure accuracy.

Analysis

Survey data were analyzed with SPSS version 26. Descriptive statistics (i.e., frequencies and percentages, and chi-square) were used to analyze the data. Microsoft Excel 2016 was used to manage qualitative data. An inductive, thematic analysis approach was used for interview data. First, the lead qualitative researcher (co-author JCE) developed a priori concepts using the theory of planned behavior, literature, and past research experience. Then, two researchers and one medical student used the priori codes to code the transcripts, and the new concepts that emerged were assigned codes. Each code(s) was placed into a category (i.e., axial coding) until saturation was met. To assess coding consistency, the codes and their assignment to text were checked and rechecked in their patterns and explanation. If discrepancies arose, researchers discussed the codes until consensus was reached. The codes were compared and queried to identify emerging themes within and across groups. The verification

procedures of the interview data were done using triangulation by comparing the participants’ views within and across subgroups, peer debriefing among two researchers and one medical student, and rich, thick description of study findings [21, 23].

Results

The semi-structured interviews were conducted among 62 Black participants during the COVID-19 pandemic across four groups: (1) 16 parents, (2) 16 essential workers, (3) 15 individuals with UMCs, and (4) 15 young adults between the age of 18 and 35 years. Majority (54.8%) reported willingness to participate in COVID-19 clinical trial research across all socio-demographics. See Table 2 for socio-demographics by willingness to participate in COVID-19 research. Statistically, there were no significant differences in willingness to participate by socio-demographics.

The TPB argues that attitudes toward and beliefs about health behaviors shape people’s intention to adopt them [18]. The following themes emerged directly from the interviews and corresponded with elements of the TPB as they relate to the perceived motivators and barriers to COVID-19 research participation in early pandemic stages: (1) positive attitudes toward research exist yet fear and distrust remain; (2) attitudes toward COVID-19 research vary; (3) physical

Table 2 Socio-demographics by willingness to participate in COVID-19 clinical trial research

	Yes		No/I do not know		<i>r</i>	<i>p</i> value
	Mean	SD	Mean	SD		
Age	38.74	14.40	42.18	13.67	0.040	0.755
	Yes		No/I do not know		<i>X</i> ²	<i>p</i> value
	<i>N</i>	%	<i>N</i>	%		
Total	34	54.8	28	45.2		
Gender					0.501	0.479
Male	12	63.2	7	36.8		
Female	22	51.2	21	48.8		
Education					0.050	0.822
Some college or less	13	59.1	9	40.9		
Associates degree or higher	21	52.5	19	47.5		
	<i>N</i>	%	<i>N</i>	%	<i>F</i>	<i>p</i> value
Category						
Essential worker	9	56.3	7	43.7		
Underlying medical condition	7	46.7	8	53.3		
Young adults	10	66.7	5	33.3		
Parents	8	50.0	8	50.0		
Income					1.387	0.250
Less than \$40,000	13	65.0	7	35.0		
\$40,001–\$80,000	8	47.1	9	52.9		
Over \$80,000	9	56.3	7	43.7		
Do not want to answer	4	44.4	5	55.6		

and psychological capability to participate in COVID-19 research; (4) motivation to participate in COVID-19 research; and (5) potential opportunities to increase COVID-19 research participation.

Theme 1: Positive Attitudes Toward Research Exist Yet Fear and Distrust Remain

The participants in all groups expressed positivity toward research. Many participants perceived research helps to understand and extend the knowledge base of science and technology in health and healthcare. The participants further described how research helps to identify the best strategies to address health issues and confirm progress and improvements in health and healthcare.

One parent stated, “It’s important. It validates experiences for people. I think it helps us to find better solutions to problems to give others a better quality of life.”

Parents acknowledged the importance of children’s participation in research with the caveat that they (Erves, Mayo-Gamble, Hull et al.) were the primary decision-makers for their children’s participation. Some parents did express there was room for older children to play a role in their own decision to participate.

Despite positive views toward research, fear and distrust in the research process persist. The participants continuously identified the historical context of research abuse particularly among Black Americans.

One participant stated, “You know, just the history with the Tuskegee experiment. The history with slavery. How people used to practice maternity procedures on Black women without any type of anesthesia. I’m not 100% confident that that mentality is extinct in this country. So, I’m very hesitant to contribute and volunteer my body.”

Another stated, “We can’t forget our history. We can’t forget Henrietta Lacks. We can’t forget them gynecological exams where Black women were not anesthetized. We can’t forget the Tuskegee experiment...”

Hence, the history of multiple discriminatory health interventions has hampered willingness to participate in research.

Theme 2: Attitudes Toward COVID-19 Research Vary

Almost all participants supported COVID-19 research. They deemed research necessary to learn more about the virus and the disease process. The participants stated research would help manage and eliminate the pandemic via identifying strategies (e.g., drugs, treatments, vaccines) to prevent and/or manage COVID-19 and its severity. While research was unanimously expressed as essential, many participants

believed Black people in the USA have long served as “guinea pigs” in this process and should not volunteer first.

One participant stated, “Well just that I think we’ve been experimented on enough and, you know, marginalized communities have always been the guinea pigs when it comes to something like this. I understand somebody has to, but it doesn’t have to be us this time because, look, we’ve had our turn.”

Theme 3: Physical and Psychological Capability to Participate in COVID-19 Research

There was consensus across all groups of the physical and psychological factors that discourage research participation or make it difficult for interested candidates to participate. We briefly describe these barriers below.

Limited Awareness and Access to Research Opportunities

The participants commonly described limited awareness and access to information related to COVID-19 and other health topics, both physical and psychological barriers to participation. A few participants further stated if they knew how to access clinical trials that were available, then they could become familiarize with the different types of trials and.

“I do not know a lot about research. I know that they are using human DNA. Testing human beings in this research. And that’s pretty much all I know about the research.”, a participant said.

Furthermore, the participants lacked understanding of types of research opportunities available along with the requirements and the process for enrolling into a research study, which were potential physical and psychological barriers to COVID-19 research participation. A few participants stated if they gained an understanding of the types of research and the process, then they could see benefit and potentially motivate them to participate.

Limited Health Literacy

Poor health literacy was another identified barrier.

One participant stated, “There are certain areas, certain pockets throughout the country that have poor health literacy rates. If my health literacy is piss poor, do you really think I know something about research? And do you really think I’m gone trust it.”

This was highlighted with some participants’ lack of information or misinformation on vaccines, dosage, and their roles in the body. Other participants used the term “vaccines” interchangeably with the concept of antiviral medication.

For example, a parent stated, “So if we had Corona, and we needed a vaccine, I would get it but to get the vaccine to prevent corona, no, but a pain relief for the kids. Yes, like a pain reliever...No preventive care, no. I don’t want to fix nothing that ain’t broke so I have to have it in order to get the vaccine.”

Influence of Political Climate

The perceived role of the federal government in the research process was a major contributor to participants’ unwillingness to accept current treatments for COVID-19.

One individual with an UMC said, “And now I have to get political. Under this administration [Trump], I would not take a vaccine, if I was the last person on earth, that came from this administration.”

Some further reported knowing the role of the government in the research process would help to make a decision on whether or not to participate in the process. The participants were also skeptical of the rapidness of research trial completion, especially vaccine trials that appeared to be “pushed” by the government and developed at warp speed.

“I think when things are rushed, they can be sloppy. And the reasons I love research are exactly because you have to be very meticulous and like thought through with how you’re going to do something, how it can be replicated, this that and the other. And so, if we’re kind of rushing to put something together, are we really like...I just don’t know.”, stated a young adult.

History of Unethical Research Studies in the USA

The participants across all groups acknowledged that historical and current research abuses within Black communities contributed to their negative perceptions of COVID-19 research. As indicated in Theme 1, many participants believed Black people in the USA have long served as “guinea pigs” in the research process. This historical context also influenced how participants with children were doubtful of the process. Parents were especially uncomfortable with their children participating in COVID-19 research.

One parent said, “No, I don’t even fool with that flu shot. So, but no, because if I go the rest of this year without corona I ain’t fooling with no [COVID-19] vaccine. I’ll let everybody else get it. Would I let my kids get it? No. Unless it was absolutely mandatory.”

The Unknown Side Effects

All participants cited they were concerned of the unknown side effects of participating in COVID-19 research trials,

including the side effects of vaccines and related treatments. Individuals with UMC in particular worried how the vaccine would interact with their current medications.

One individual with UMC said, “That’s a good question because my first concern would be how is that going to interact with what I’m already taking? How is that going to interact with the current medication that I’m on that’s keeping me alive?”.

Many young adults stated they preferred natural medicines rather than risk experiencing side effects of the COVID-19 vaccine and related treatments.

One young adult said, “I don’t want to do no vaccine or anything. I’m not taking a medication. Because like I said I was a fan of Dr. Sebi. And doing his research and listening to interviews and things like that. I don’t feel like medication is necessary because it’s all chemical and some of those things, if you look at the ingredients on medications, a lot of more are pretty much poison.”

Theme 4: Motivation to Participate in COVID-19 Research

All groups expressed the significance of research and its benefits across many levels. We describe each below.

Advancing Science

The participants expressed how research would help to manage and alleviate the pandemic as well as provide insight into future pandemic management. So, understanding the research and how it could potentially advance science increased the likelihood of many participants. This is a form of reflective motivation.

One participant stated, “Once we’ve completed the research, we’ll have a better understanding of what’s going on and how to not only combat it now, but how to make preparations so that it’s not this bad in the future.”

Altruism

Many participants described the social benefit of research participation at the individual and community levels from a sense of altruism. So, these individuals were more motivated to participate if there was a positive outcome for self and/or others, a form of automatic motivation. This theme was particularly highlighted among individuals with UMC, many of whom recognized the historical injustices of research malpractice against Black communities while also acknowledging that their own health status was being maintained by treatments that came from research.

One participant said, “The example that you set for the next generation is important, and if making sure that they live a COVID-19-free life is something that will be beneficial to my grandchildren’s children, then I think that’s an important thing.”

Study Type

Participants across all groups expressed preference for participating in studies such as surveys and interviews, rather than those that involved the introduction of foreign material into the body, such as in treatment trials (i.e., drugs) and prevention trials (e.g., COVID-19 vaccine trials). This means participants were motivated to avoid a negative consequence.

One parent said, “And so if it’s similar to this, just asking them questions or what not, I don’t mind. But that’s not what came to mind. I was thinking shots. I was thinking you being isolated and so many different tests are ran on you and stuff like that. So nah, I wouldn’t be down for that.”

Theme 5: Potential Opportunities to Increase COVID-19 Research Participation

Many participants offered social opportunities to increase research participation. One of the strongest suggestions was to increase the ability of researchers, both from the clinical sciences and particularly basic sciences, to engage with and educate communities on research without shame or judgment. Additional strategies included past research participants sharing testimonials on clinical research experiences and recommending research participation, improving communication around research opportunities along with requirements, and more details regarding the research process. Proposed communication social and physical opportunities included making better use of webpages of academic institutions and non-profit organizations as well as improving communication between providers and patients along with researchers and the participants they recruit.

“I’m not aware of opportunities. I would feel more comfortable if I could go on Meharry’s website or you know Vanderbilt website or even if it was a hospital website, you know, St. Thomas Midtown or whatever and see what’s going on. And if there was something I wanted to sign up for I would feel comfortable doing that as long as the information was, you know, laid out.”, a participant stated.

Lastly, the participants highlighted the importance of using social media as a tool to improve communication around research.

One participant said, “Flat out, flat out social media, especially, especially, especially websites. Like from the USDA and other known credible websites. Now, I’m not sure this is part of the question but of course, paid incentives, especially during this time.”

Ultimately, these recommended strategies are likely to increase research participation.

Discussion

Research participation is often understood and discussed as a binary choice (i.e., acceptance or rejection). Using the TPB, our study provides new perspectives of a complex issue by offering context and nuance to what motivates research participation in general, and COVID-19 research more particularly in the early pandemic stages. While there will always be a portion of the population that outright refuses to participate in research, our study explores underlying reasons for those rejections as well as barriers that prevent interested individuals from research participation.

Our study shows that essentially all study participants understood the value and benefits of research to improve human health. Altruism and social benefits were motivating factors, particularly for participants with UMC who expressed the value that research has had on their ability to care for themselves. This finding is congruent with previous studies that have shown that intrinsic motivation to contribute to a broad social benefit is associated with research participation [17]. This finding is also consistent with the TPB which posits that attitudes, social norms, and perceived control influence health behavior. Individuals with a strong sense of perceived benefit are likely to participate in research. A significant motivator for research acceptance from our study was study type. All participants, regardless of study group, expressed a preference for research studies that were quantitative surveys or qualitative in nature, such as interviews and storytelling as they were perceived as low or zero risk to the participant. Such perceived low risk is conceptualized as perceived behavioral control in TPB and is positively related to engaging in a health behavior. However, most participants associated research with clinical trials and did not perceive that their ideas and observations contributed to research participation. In addition, these results suggest that bidirectional communication, which clearly defines the research subject and the format, as well as options for participating, including incentives, should be clearly communicated in research recruitment to potentially increase research participation for Black individuals.

A lack of participation, on the other hand, manifested as either outright rejections to research or barriers that made it

challenging for individuals to participate regardless of interest. The most strongly associated barrier to research participation was mistrust of academic and medical institutions, with many participants citing the human rights violations of the Tuskegee Syphilis Study [24] as the root for mistrust. This finding is in accordance with existing literature that has shown racial minority participants, relative to White participants, were found to be persistently less positive about the use of medical information for research [25]. Similarly, in the context of the TPB, we can understand that negative attitudes toward research and researchers correspond to a negative association with research participation. However, rejections to research participation do not entirely account for the disproportionate rates seen among racial minorities. Frequently discussed barriers to participation were low levels of health literacy, a lack of information regarding clinical trials and various research platforms, and limited awareness of opportunities for participation, as well as logistics of the research process. Addressing these barriers requires intentional effort on the part of public health officials, and basic and clinical scientists especially, to communicate information effectively, as well as being culturally sensitive [26]. While communication was noted to be an area for improvement to increase research participation in our study, the mode of communication is also an important factor [27]. Information dissemination has been confusing and inconsistent throughout the entire pandemic [28]. For example, several new terms were presented to the public [29], which may have added to an individual's undecidedness to participate in the COVID-19 vaccine clinical trial and even hesitation to getting the vaccine after approval. Rather than credible sources defining these terms, many communities relied on social media as their primary source of information, particularly in areas where there is a dearth of healthcare providers [30]. While it has its uses, social media can subject the public to misinformation, and deliberately false information, that can negatively influence decision-making [31]. The participants clearly stated the need to understand more about mRNA and DNA, in addition to how viruses and vaccines work. These findings illustrate the importance of improving communication about the research process to effectively recruit marginalized and underrepresented participants for future research.

Limitations

This study was conducted toward the beginning of the pandemic from May to September of 2020. Our results may not reflect current perceptions of COVID-19 research that may have been influenced by increased information and the change in federal administration. Additionally, the results of this study may not be generalizable to other

underrepresented research populations beyond the USA. However, we purport the findings will provide valuable guidance for future communication of research opportunities. Future studies are needed to better understand how intentions and ultimate participation in COVID-19 research are influenced by evolving attitudes toward COVID-19 as well as potential feelings of burn out from taking precautions against multiple strains, adhering to changing mandates, and research concepts (e.g., socioeconomic status, informed consent, transportation, childcare). Additional studies should also explore if and how strategies may differ to recruit and retain African Americans in studies, especially longitudinal studies where many individuals are lost to follow-up.

Conclusions

This study aimed to use the TPB to explore the views toward COVID-19 research among Black communities in the USA to better understand the nuances around hesitation and the scope of willingness to participate in COVID-19 research in early pandemic stages. This is especially important due to the surge of evolving strains of SARS-CoV-2, such as the Omicron and its subvariants. Globally, we have witnessed multiple SARS epidemics; the first was reported in Asia in 2003 caused by the original strain, SARS-CoV, which spread to more than two dozen countries causing 8000 illnesses and 700 deaths before it was contained [32]. The second epidemic, which was found in Saudi Arabia, called the Middle East respiratory syndrome coronavirus (MERS-CoV) [33], occurred in 2012 and resulted in about 2500 cases and 800 deaths. These observations suggest a high probability that future epidemics will emerge. Whether these epidemics progress to pandemics is contingent on our preparedness and response. Involving a representative proportion of racial/ethnic minority participation in clinical trials that target infectious agents like viruses contributes to informing the continued evaluation of the safety and efficacy of FDA-approved products. Our findings aim to support improved interventions and communication strategies, such as the efficient use of social media by credible sources, providing incentives for research participation, and using clear language when describing each component of research participation. Understanding what motivates marginalized and historically excluded people to participate in research is critical for the development of best research recruitment and implementation practices, systemic changes in healthcare delivery, and improved health outcomes. With the potential shifting of the pandemic to becoming endemic, adequate representation in future clinical trials for vaccines and novel treatments against SARS-CoV-2 are equally important.

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Data Availability Research data are not shared due to ethical restrictions.

Materials Availability Research data are not shared due to ethical restrictions.

Code Availability Not applicable.

Declarations

Ethics Approval This study was approved by Meharry Medical College Institutional Review Board (IRB).

Consent to Participate Informed consent was obtained from all study participants.

Consent for Publication Not applicable.

Conflict of Interest The authors declare no competing interests.

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