




Mitigating COVID-19 Risk and Vaccine Hesitancy Among Underserved African American and Latinx Individuals with Mental Illness Through Mental Health Therapist–Facilitated Discussions

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Abstract

Background Underserved ethnic minorities with psychiatric disorders are at an increased risk of COVID-19. This study aims to examine the effectiveness of one-to-one counseling on COVID-19 vaccination and vaccination readiness among underserved African American and Latinx individuals with mental illnesses and adult caregivers of children with mental illness.

Methods Through an academic-community partnered collaboration, a multidisciplinary and culturally sensitive training on COVID-19 was co-developed and delivered to 68 therapists from January to March 2021. Mental health clients and their caregivers were recruited to participate in pre- and post-intervention surveys to evaluate the impact of the intervention on their perceptions of COVID-19 public health guidelines, testing, and vaccination. Mental health therapists delivered four lessons of the COVID-19 educational intervention with 254 clients from March to June 2021, when vaccine availability was widely available. Of those clients, we collected 180 baseline and 115 follow-up surveys. The main outcome was the uptake in COVID-19 vaccine.

Results There was a positive shift in participant vaccine acceptance and receptivity. Pre-intervention survey shows that only 56% of adult clients and 48% of caregivers had indicated a likelihood of getting the vaccine for themselves at baseline. Post-intervention documented that more than 57% of each group had been vaccinated, with another 11–15% of the unvaccinated individuals reporting that they were somewhat or very likely to get the vaccine.

Conclusion This study demonstrated that multidisciplinary academic-community and theoretical-based educational intervention delivered by mental health therapists is an effective strategy in increasing COVID-19 vaccine acceptance and reducing the negative impact and disruption that COVID-19 caused in the daily life of mental health patients and caregivers.

Keywords Psychiatry · Mental health · COVID · Intervention · Vaccine hesitancy

Introduction

Socioeconomically disadvantaged ethnic minorities with psychiatric disorders are at an increased risk of COVID-19 for multiple reasons [1–4]. First, low-income status increases the risk of facing a disproportionate burden of COVID-19 disease and undesired outcomes [5–8]. In addition, racial and ethnic minorities are also at a disproportionate burden of COVID-19 disease [9–13]. Finally, given the close link

between poor mental health and COVID-19 [14–16], populations with psychiatric conditions suffer a higher risk and burden of COVID [17, 18]. A recent systematic review and meta-analysis of 21 studies that involved more than 91 million individuals suggest that individuals with preexisting mood disorders are at higher risk of COVID-19 hospitalization and death and should be categorized as an at-risk group on the basis of a preexisting condition. [19].

Moreover, a retrospective cohort study of COVID-19 positive patients in a New York academic medical system found an increased risk of mortality for patients with schizophrenia and mood disorders, such as major depressive disorder when adjusted for age, sex, and race [20]. In another study, patients with substance abuse disorders also had an increased risk of

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hospitalization and mortality in comparison to match controls with comorbidities such as obesity and diabetes [21]. However, no increased risk was found for patients with anxiety disorders [20]. Yet still, socioeconomically disadvantaged ethnic minorities with preexisting mental health conditions are at greater risk for surmounting the burden of the COVID-19 pandemic due to structural racism and other socioeconomic factors, such as having limited access to care and resources prior to and during the pandemic [22–24]. The COVID-19 pandemic augmented preexisting gaps in care and social services for racial and ethnic minorities with mental illness and various comorbidities across the nation [22, 23, 25]. Furthermore, poorer minority groups are more likely to be living in crowded, multigenerational homes and deemed as an “essential worker” in public facing employments whereby social distancing has been more difficult to maintain. In addition to the higher prevalence of the comorbid chronic disease among racial/ethnic minorities, there is also an increase in the percentage of mental illness and substance use among this segment of the population during the COVID-19 pandemic [26, 27].

Because this population has multiple disadvantages and elevated health risk factors [28], and they are less able and hence less likely to engage in social distancing, they remain more susceptible to contracting the COVID-19 virus and suffer overall higher rates of ensuing morbidity and mortality [28–30]. Unfortunately, in addition to lower rates of social distancing, vaccination rates also remain low in economically disadvantaged ethnic minority populations, particularly among those with diagnosed psychiatric disorders [31–35]. This is important because engaging in social distancing and vaccination uptake are key protections against the COVID-19 virus [31, 35–39].

The combination of high stigma, limited resources, psychiatric conditions, and adverse living conditions may also exacerbate unhealthy behaviors and decrease trust and increase noncompliance with public health directives such as quarantine measures, social distancing, and use of masks [26, 40–44]. Populations with low-income, those who live in underserved communities, ethnic minority people, and those with pre-existing psychiatric and substance use issues are at a higher risk for adverse psychosocial outcomes and also are less likely to adhere to preventive protocols [26, 40–44]. They may also suffer fear, anxiety, and anger, which may negate uptake in testing and receiving the vaccine [26, 40–44]. These risk factors can weaken strategies of COVID-19 control which will increase their morbidity and mental health needs.

Community mental health centers that are located in underserved areas and provide services for ethnic minority individuals with mental health conditions in low-income,

minority communities are an ideal vehicle to prevent COVID infection in low-income communities of color [45–47]. Community mental health therapists are trusted by their low-income minority patients because many are from similar backgrounds who live in communities that they serve, so such personnel are uniquely poised to help their clients mitigate the COVID-19 risk [45–47]. Although the potential of mental health providers to address public health issues like increasing vaccination rates has been discussed, little evidence exists on how these types of interventions could affect wellness and public health efforts [45–47].

Brewer and colleagues (2017) have cited three general theories for understanding and increasing vaccination uptake and public guideline adherence in psychological and behavioral frameworks [48]. The first theory is based on how thoughts and feelings motivate vaccination or public guideline adherence [48]. Mental health providers are trained to help their clients explore these thoughts and feelings, which can guide motivation for the COVID-19 vaccine uptake. The second theory is that the social context of vaccination and public guidelines adherence play a large role in individual decision-making [48]. Mental health providers have the potential of addressing how clients view their social context and how to interpret that information for themselves. Lastly, the third theory is that psychological reframing can potentially result in a direct behavior modification but it is unclear what setting and situation that would be for vaccine acceptance [48]. Thus, there is a need to test the efficacy of interventions that leverage the mental healthcare facilities that provide services for low-income ethnic minority populations with psychiatric conditions and substance use problems.

Through an academic-community partnered collaboration between Charles R. Drew University of Medicine and Science (CDU) and Tessie Cleveland Community Services Corporation (TCCSC), a non-profit community-based mental health agency primarily serving minority groups in Los Angeles and Riverside Counties, we designed a multidisciplinary, theoretically based, and culturally sensitive interventional project. TCCSC was founded to serve low-SES, ethnic-minority communities and employs a clinical staff comprised to reflect the community served, with the majority being African American and/or Latinx. The goals of the collaboration and intervention were to increase uptake in COVID-19 testing and vaccination and reduce social, behavioral, and health disparities related to COVID-19 for African American and Latinx groups with mental illness, with a specific focus on leveraging existing relationships with mental health professionals already working in these communities.

Methods

Community Partnered Intervention Development

This was an academic-community partnered collaboration between CDU and TCCSC, designed to deliver an intervention to increase uptake in COVID-19 testing and vaccination and to reduce social, behavioral, and health disparities related to COVID-19 for African American and Latinx groups with mental illness, with a specific focus on mental health professionals working in these communities.

The intervention was a multidisciplinary, theoretically based, and culturally sensitive intervention specifically designed for low-income, ethnic-minority adults and caregivers of minors with mental health and psychiatric conditions [49–52]. Interventions structured in this manner are believed to generate superior outcomes for ethnic minority, low-SES populations that have low trust and high stigma [49–52]. The target population included two groups: adult clients with mental illness and adult parents/caregivers of child clients with mental illness. Study participants were separately recruited by TCCSC email broadcast, phone calls, and verbal referral by TCCSC staff and instructed to complete a pre-intervention survey.

COVID Ambassador Training

An 8-hour training program was delivered over the course of two days on January 7th and 8th of 2021 to 68 TCCSC therapists on various COVID-19 topics. The training program consisted of expert presentations on COVID-19 symptoms, transmission, prevention guidelines, vaccine efficacy, household planning, and personal healthcare during the pandemic. Trainings were provided by a variety of CDU faculty, including infectious disease specialists, public health experts, pediatricians, psychiatrists, and others with specific expertise in relevant fields. The training curriculum included (1) comprehensive knowledge of COVID-19 infection and transmission; (2) promotion of information, motivation, and behavior (IMB) framework concepts and its application toward the adherence of COVID-19 prevention methods; and (3) recognition of the impact of COVID-19 on mental status and wellness (obsessive behaviors, social isolation, etc.). All therapists who completed the training activities were recognized as COVID-19 ambassadors. All trained therapists have a masters' degree education in social work or marriage and family therapy. The majority of the therapists trained are female (80%), and most identify as Latinx (50%) and African American (30%).

Immediately following the training, a survey was administered to evaluate the therapist participants' perceptions

of the training they received. Additionally, therapists were asked to provide written responses to three questions, asking them to describe the usefulness of the training and to provide suggestions for improvement. While there was not entirely uniform agreement, a vast majority of staff displayed a high level of appreciation for the training provided overall, particularly emphasizing their appreciation for the opportunity to hear from experts from a Historically Black Colleges and Universities (HBCU) with similar racial/ethnic makeups as the staff and clients. Due to unforeseen circumstances with the COVID-19 pandemic, participant recruitment and intervention facilitation were postponed to March 2021. A supplemental training was also provided on March 15, 2021, to review public health guidelines and update information regarding vaccine availability. The pre-intervention survey instrument was constructed on the online platform REDCap.

Following the therapist training, COVID-19 ambassadors met (online) with their clients every 2 weeks (4 total sessions per client) over 2 months between March 22nd and June 30th of 2021, to provide the COVID-19 education through informal discussions. An educational guideline was developed collaboratively between TCCSC and CDU for the ambassador to use as a framework for discussion. The guideline was divided into four lessons, each 10–15 min in length that the COVID-19 health ambassadors could facilitate with their clients at the end of their therapeutic appointment for each session. This was simulated via role-play during the 2-day training. Each lesson guide was developed as a culturally and linguistically competent document that could easily be shared/read to the client by the COVID-19 ambassador. Following all four sessions, participants were invited to complete a post-intervention survey. The Appendix shows the details of the curriculum of the interventions.

Recruitment/Participants

We initially sought to recruit 240 participants from among TCCSC's client population of approximately 950 active clients (with a targeted participation rate of 25%), including both adult clients and parents/caregivers of youth clients (under age 18). Of the 950 clients, approximately 60% were Latinx, 30% African American, and the remaining 10% White, Asian, or other. However, we successfully collected 180 baseline surveys (94 adults, 85 caregivers, for a participation rate of 18%) and 115 follow-up surveys (63 adults, 52 caregivers, for a retention rate of 64%). Participants were recruited from March 15, 2021, to June 30, 2021, for the pre-survey. Each COVID-19 ambassador facilitated the intervention over a 2-month period, but the administration may have varied based on the frequency of therapy session. The post-intervention surveys were administered from June 7, 2021, to August 31, 2021. The COVID-19 health

ambassadors/therapists facilitated all four of the lessons of the COVID-19 educational intervention with all participants who participated in this study. The pre- and post-surveys were administered online without engaging therapists in the data collection. Upon request, some surveys were conducted over the phone with assistance from research staff. TCCSC sessions are historically provided in person, in community locations convenient for clients, and most often in their homes. However, due to the COVID pandemic, most clients received their sessions via telehealth during the study.

Measurement

Several survey items on COVID-19 knowledge and personal behavioral practices or adherence to public health guidelines were adopted from the PhenX Toolkit on COVID-19 (www.phenxtoolkit.org). We developed a separate survey for adult clients and for parents/caregivers of child clients to capture different perspectives of each population. Our survey instrument included demographics, SES, vaccine-related attitudes, and psychiatric disorders, race, ethnicity, sex, age, education, household income, marital status, living arrangement, mental health conditions, and whether the participants self-identify as a parent/caregiver of a child with mental illness.

Mental conditions included ADHD, adjustment disorder, anxiety disorder, conduct disorder, depressive disorder, mood disorder, psychotic disorder, trauma, and others. The outcome was vaccination uptake and likelihood of getting COVID-19 vaccine (if unvaccinated) which were either likely, unsure, or unlikely. In the pre-intervention survey, participants were asked, on a scale from 1 (Very unlikely) to 5 (Very likely), how likely they were to get a COVID-19 vaccine. At the time of the post-intervention survey, vaccines against COVID-19 were more widely available to the public, so participants were asked about their vaccination status in addition to the question about vaccination likelihood. For the purposes of pre-post analysis, the vaccination acceptance variable combined those who reported being vaccinated with those who reported being very likely to get vaccinated. In addition to the surveys collected from client-participants, the tracking logs show that all clients who participated in this study were fully educated, completing all 4 sessions with their therapist.

Data Analysis

Data from pre- and post-intervention surveys were analyzed for adult patients and caregivers separately and for the groups combined. For descriptive analyses, we present means and standard deviations or frequencies and percent. We test for significance using McNemar tests for pre-post comparisons. A p value < 0.05 is used to determine statistical significance.

Results

Demographic Characteristics

The demographic characteristics of the adult mental health clients and parent/caregivers of youth clients who participated in the pre-surveys are summarized in Tables 1 and 2. Both the adult patients and the caregivers had a similar racial/ethnic distribution as the general population of TCCSC clients. Overall, the mean age of adult participants was 36 years old, and the mean age of caregivers was 41. The majority of participants identified as Latinx (65% adult patients; 68% caregivers) and African American (25% adult patients; 25% caregivers). The majority were female (72% adult patients; 88% caregivers). Educational attainment for both groups ranged from less than high school graduate to some college/associate degree. A majority of participants identified as single/never married/divorced, although caretakers were less likely than patients to identify this way (81% adult patients; 61% caretakers). The majority of adult patient participants reported receiving mental healthcare for anxiety, depression, mood disorder, and trauma. A much higher percentage of attention deficit hyperactivity disorder (42.4% vs 7.5%; $p < 0.001$) and conduct disorder (21.2 vs 3.2%; $p < 0.001$) were reported by caregivers for their youth clients in comparison to adult clients. The majority of the participants in both groups reported a household income of \$30,000 or less.

Vaccine Acceptance and Uptake

Of those participants who indicated at baseline that they were “very” or “somewhat” likely to be vaccinated, 79% reported having been vaccinated post-intervention (“very likely,” 97%, and

Table 1 The topics included in the lectures of 4 session/lesson

Session/lesson	Description
Session/lesson 1: COVID-19 symptoms, transmission, and prevention	Description of common COVID-19 symptoms, airborne transmission and contact with asymptomatic or symptomatic individuals, importance of face masks in prevention
Session/lesson 2 – societal action, vaccine, and benefits	Importance of public health guidelines such as social distancing, isolation, quarantine, testing, and contact tracing. Vaccine efficacy, dosage, and potential side effects
Session/lesson 3 – household planning	How to create an emergency plan during the pandemic
Session/lesson 4 – mental and physical health	Importance of maintaining physical and mental health during the pandemic. Creating coping strategies in times of stress

Table 2 Characteristics of participants

Characteristic	Adult patients (<i>n</i> =94) <i>N</i> (%)	Caregivers (<i>n</i> =85) <i>N</i> (%)	<i>p</i> value
Age range and mean	[18- 82: 36]	[22-72: 41]	
Race/ethnicity			0.0878
Latinx	60 (64.5)	58 (68.2)	
Black	23 (24.7)	21 (24.7)	
White	10 (10.8)	3 (3.5)	
Other	0 (0.0)	3 (3.5)	
Gender			0.0419
Female	68 (72.3)	75 (88.2)	
Male	24 (25.5)	8 (9.4)	
Transgender	1 (1.1)	1 (1.2)	
Prefer not to answer	1 (1.1)	1 (1.2)	
Education level			0.2200
< HS grad	25 (26.6)	27 (31.8)	
HS grad	34 (36.2)	30 (35.3)	
Some college/associate degree	26 (27.7)	13 (15.3)	
College degree	5 (5.3)	8 (9.4)	
Prefer not to answer	4 (4.3)	7 (8.2)	
Marital status			0.0036
Single/never married/divorced	76 (80.9)	52 (61.2)	
Married/living with companion	18 (19.2)	33 (38.8)	
Living arrangement			0.0002
Lives alone	17 (18.1)	1 (1.2)	
Live with other(s)	77 (81.9)	84 (98.8)	
Mental healthcare*			
ADHD	7 (7.5)	36 (42.4)	< .0001
Adjustment disorder	3 (3.2)	8 (9.4)	0.0836
Anxiety disorder	45 (47.9)	35 (41.2)	0.3682
Conduct disorder	3 (3.2)	18 (21.2)	0.0002
Depressive disorder	47 (50.0)	28 (32.9)	0.0209
Mood disorder	23 (24.5)	26 (30.6)	0.3591
Psychotic disorder	8 (8.5)	6 (7.1)	0.7179
Trauma	26 (27.7)	25 (29.4)	0.7954
Other	11 (11.7)	7 (8.2)	0.4412
Don't know	8 (8.5)	5 (5.9)	0.4986
Household annual income			0.0761
< \$10,000	43 (46.7)	27 (31.8)	
\$10,000–30,000	36 (39.1)	34 (40.0)	
\$30,000–50,000	9 (9.8)	15 (17.7)	
> \$50,000	4 (4.4)	9 (10.6)	

* Mental healthcare diagnosis of youth clients reported by their caregivers

“somewhat likely,” 54%). Of those who reported at baseline that they were “very” or “somewhat” unlikely to get vaccinated or “unsure,” 27% reported post-intervention that they were “somewhat” or “very” likely to be vaccinated. In addition, 39% of those who indicated at baseline that they were “not willing” to be vaccinated or “unsure” subsequently received a vaccine. As Table 3 shows, about 57% of each group reported being vaccinated in the post-intervention survey, with an additional 11–15% of those

unvaccinated indicating they were likely to get the vaccine. This resulted in a dramatic shift in vaccine acceptance from pre-intervention to post-intervention, as only 56% of adult patients and 48% of caregivers had indicated they were likely to get the vaccine pre-intervention. For the purposes of analysis, for post-intervention, those who had been vaccinated were combined with those who reported being likely to get vaccinated, resulting in statistical differences from pre-intervention to post-intervention for

Table 3 Pre-post changes in vaccine acceptance in adult patients, caregivers, and all participants

Vaccination status	Adult participants			Caregiver participants			All participants		
	Pre-intervention, <i>n</i> = 63	Post-intervention, <i>n</i> = 63	<i>p</i> value	Pre-intervention, <i>n</i> = 52	Post-intervention, <i>n</i> = 52	<i>p</i> value	Pre-intervention, <i>n</i> = 115	Post-intervention, <i>n</i> = 115	<i>p</i> value
Vaccinated:			0.029			0.028			0.001
Yes	1 (1.6)	36 (57.1)		None	30 (57.7)		1 (0.9)	66 (57.4)	
Likelihood of getting a vaccine									
Likely	35 (55.5)	10 (15.9)		25 (48.1)	6 (11.5)		60 (52.2)	16 (13.9)	
Unsure	11 (17.5)	6 (9.5)		14 (26.9)	6 (11.5)		25 (21.7)	12 (10.4)	
Unlikely	16 (25.4)	11 (17.5)		13 (25.0)	10 (19.2)		29 (25.2)	21 (18.3)	

adult patients (p value=0.0296), caregivers (p value=0.0275), and all participants (p value=0.0008).

Discussion

Multiple recent studies have documented that ethnic minorities with psychiatric disorders are at an increased risk of COVID-19 [1–4]. Individuals with mental illness should therefore be prioritized in risk reduction and promoting vaccine strategies [30, 53]. However, the potential of mental health professionals and agencies to address barriers to COVID-19 vaccination among mentally challenged patients has received inadequate attention [54]. Our study aimed to test the efficacy of a two-step intervention program on vaccination uptake of low-income minority patients with mental health conditions. Post-test was associated with an increase in vaccination uptake that indicated the efficacy of our intervention in promoting vaccination and reducing vaccine hesitancy. Our results highlight the important role that mental healthcare providers can play in mitigating the effects of COVID-19. Identifying the best options of activities to engage mental health therapists is an important aspect of mitigating the risk for low-income ethnic minority individuals with mental health problems. COVID vaccine ambassadors and training of healthcare providers are among well-established strategies to educate patient populations. Our results suggest the interventions that engage mental health therapists are effective in reducing the negative impacts of the COVID pandemic on low-income ethnic minority individuals with mental health problems.

Although we did not measure mistrust, the intervention was designed to combat mistrust by not only providing reliable information, but providing it in culturally competent ways and by mental health therapists that had developed trusting relationships with their clients, which likely contributed to its success in increasing vaccine acceptance. Our results are aligned with the three general theories Brewer and colleagues (2017) suggested, in that mental

health providers have the skills to help increase vaccination uptake and public guideline adherence through motivational interviewing, incorporation of social context in individual decision making, and direct behavior modification through psychological reframing [48].

However, we encountered several challenges throughout the study, including some COVID-19 hesitancy among mental health therapists that affected their willingness to participate in this study, as well as experiencing unexpectedly high turnover among mental health therapists during the course of the project. One out of three therapists trained declined to participate in providing the education to their clients, despite being offered substantial financial incentives. We attribute this phenomenon largely to staff burnout, combined with substantial vaccine hesitancy in the communities to which they belong. Indeed, the increased turnover among mental health therapists during the project may also be attributed to the pandemic, as 17 of the 68 trained staff (25%) were no longer employed at the conclusion of this project. The opinions toward COVID-19 vaccination are held widely among the population at large, and mental health therapist staff proved no exception, despite attending the training provided by faculty from CDU. This may be partially explained by the racial/ethnic makeup of mental health therapists, which closely resembles that of the client population, with the majority identifying as Latinx or African American groups, which have been evidenced to have high rates of COVID-19 mistrust and vaccine hesitation [55]. A recent review of a pool of 13 studies with more than 107,841 participants documented that the overall COVID-19 vaccination hesitancy for adult Americans was 26.3%, but much higher for Hispanics (30.2%) and African-Americans (41.6%) [56]. Therefore, increased focus on building rapport and gaining trust as well as additional educational motivational discussion and skill building with mental health therapists are strongly recommended.

In addition, we encountered a low rate of participation among African American and Latinx clients. Client participation was a challenge mainly due to the variety of

mental health diagnoses among the target population and documented mistrust among African American and Latinx communities, as well as complexity in outreach efforts to clients since utilizing their primary therapists was avoided to prevent bias. Even though several strategies were utilized to mitigate this issue (e.g., culturally matched messaging, etc.), we experienced lower than anticipated rates of survey completion. This lower completion rate may have limited our power to detect significant changes for some outcomes.

Finally, there were several limitations in this study. The intervention coincided with a number of changes in the pandemic that likely affected our results. Between the pre-intervention and post-intervention surveys, vaccines became widely available, and many public health guidelines were relaxed. Therefore, the lack of a comparison group to determine whether vaccination status and readiness changed due to intervention or other external factors is unknown. However, it is important to note that from ethical point of view, it would be hard to justify excluding individuals from receiving the intervention since we were working with a population that is a high risk for COVID-19 and would benefit from the intervention. Another limitation is the small sample size within both groups of adult clients with mental illness and parents/caregivers of minors with mental illness. Despite these limitations, the results showed that community-based mental health therapists play a pivotal role in mitigating COVID-19 risk and vaccine hesitancy among their clients.

Conclusion

This study demonstrated that multidisciplinary academic-community and theoretical-based educational intervention delivered by mental health therapists is an effective strategy in increasing COVID-19 vaccine acceptance. This finding supports the theoretical viewpoint of Brewer who recently published an article highlighting ways mental health providers can help promote COVID-19 vaccine uptake among their clients [54]. The results suggest that there may be flexibility in the structure of the intervention while maintaining its effectiveness and that the intervention can be effective even with participants who do not appear readily receptive to the information. Overall, mental health providers are an important resource of reliable health information for their clients and can help their clients make decisions to mitigate the effects of COVID-19 and improve their quality of life.

Appendix 1

Table 4

COVID-19 Education – Lesson #1

What is COVID-19?

COVID-19 symptoms

- Fever, chills, fatigue, cough (usually dry cough), loss of appetite, myalgias (muscle pains), shortness of breath/difficulty breathing, headache, sore throat, loss of taste and smell, nausea or vomiting, diarrhea, congestion or runny nose can be asymptomatic:
- Many people who get COVID-19 show minimal symptoms or have a mild flu-like illness where they can recover at home
 - When you are exposed to the virus, you may not develop symptoms right away. Quarantine immediately if exposed
 - Get tested after 5 days of being exposed
 - Self-isolate for 10 days after onset of symptoms or first positive test without symptoms

Who's at higher risk?

- Elderly – immune system gets weaker as we get older
- Immunocompromised – e.g. cancer patients, people with organ transplants, people with immune deficiencies, people with HIV/AIDS – the immune system doesn't work well to fight off viruses
- People with multiple health problems, diabetes, severe obesity, on dialysis for chronic kidney disease, liver disease
- People with a history of smoking or current smokers

Prevention

- Always use personal prevention protection methods, whether at home, work, school, community events, or elsewhere
- Wash hands often with soap and water for at least 20 s; dry hands with a clean towel or air dry hands
 - Use alcohol-based hand sanitizer when soap and water are unavailable
 - Wear a mask
 - Cover your mouth with a tissue or sleeve when sneezing or coughing
 - Avoid touching your eyes, nose, or mouth with unwashed hands
 - Stay home when you are sick. Avoid contact with people who are sick

COVID-19 mask protection

What is personal protective equipment (PPE)? Why is it important?

- Equipment meant to protect the wearer from illness or transmitting the illness to others. Masks are PPE
- Gloves, face shields, and gowns can be utilized for additional protection

Information about masks:

- N95 mask – *protect yourself and others*
- Able to filter 95% of aerosolized virus particles from the air – protects the wearer from airborne viruses
- Surgical mask – *protect others*
- Protects the wearer from large airborne droplets and splashes and others from the wearer's respiratory emissions
- Does not filter small viral particles from the air and air is able to leak in around the edge of the mask when the user inhales, so the user may still contract airborne viruses
- Loose fitting
- Cloth mask—*protect others*
- Similar function to surgical mask with less effectiveness

Table 4 Detailed intervention on therapists

Day 1		
Moderator: Health services research specialist, board-certified pediatrician, board-certified nurse specialist		
Date: 1/7/2021 Time: 1:00 pm–5:00 pm		
Time (min)	Activities	Facilitator
1:00 pm	Introduction	Director of TSSCO and CDU research team
1:10 pm	COVID-19 overview	Board-certified infectious disease specialist
1:50 pm	Pediatric care with COVID-19	Board-certified pediatrician
Break (10 min)		
2:30 pm	COVID-19 testing w/ minority communities	Board-certified family medicine specialist
3:00 pm	COVID-19 medication management	Board-certified pharmacist
Break (5 min)		
3:35 pm	Mental health impact of COVID-19	Board-certified clinical psychologist
4:05 pm	COVID-19 vaccination	Board-certified infectious disease specialist
4:35 pm	COVID-19; patient perspective	General medicine
4:50 pm	Q & A; wrap-up	Board-certified infectious disease specialist
Day 2		
Date: 1/8/2021 Time: 1:00 pm–5:00 pm		
Time (min)	Activities	Facilitator
1:00 pm	Welcome address	Co-director of project (CDU and TSSCO)
1:05 pm	COVID-19 impact on minorities in underserved areas	Board-certified internist
1:45 pm	Social determinants of health and COVID-19	Public health specialist
Break (10 min)		
2:15 pm	COVID-19 and the family	Nurse specialist
2:45 pm	Guidance for COVID-19	Board-certified pediatrician; clinical social worker specialist
Break (10 min)		
3:25 pm	Educational intervention	Board-certified pediatrician; clinical social worker specialist
3:45 pm	Role play of the intervention	Small groups
4:30 pm	Roles and responsibilities of therapists	CDU and TCCSC
4:50 pm	Q & A; Wrap-Up	CDU and TCCSC

COVID-19 Education -

Lesson #2

Societal actions

What are we doing as a society to reduce the spread of COVID-19?

- **Contact tracing:** close contacts of a known case are identified, told of exposure, and encouraged or mandated to self-quarantine
- **Quarantine:** restricts movement of people exposed to a contagious disease to monitor for development of disease. This principle is based on the idea that people can be infectious before they become symptomatic
- **Isolation:** separating sick people from those who are not sick to prevent the spread of disease
- **Physical distancing:** minimizing contact between people from different households helps prevent the spread between asymptomatic people

COVID-19 testing

Types of methods to test for COVID-19

Nasopharyngeal or oral swab COVID-19 test: a nasal/throat swab test is a q-tip that is twirled around inside the nostrils or mouth. Takes 10 s or less. The test might feel uncomfortable and might make you teary, but it should not hurt

- **PCR test:** the PCR test is the most accurate test available. Results are ready in 1–2 days but may vary in the lab's capacity to process several tests
- **Rapid antigen test:** a nasal/throat swab that works similar to the pregnancy test or rapid strep test. Results are available in 15 min but less accurate than the PCR test

COVID-19 blood test/antibody test

The blood test identifies antibodies that the body's immune system has produced in response to the infection. It can only identify past infection, not the current infection. The antibodies developed after an infection may decrease in just a few months, suggesting that long-lasting, protective immunity is not guaranteed

COVID-19 vaccines

Benefits

- Getting vaccinated lowers your chances of getting sick. If you do get COVID-19, the vaccine will probably also keep you from getting severely ill
- Will also help protect other people, including those who are at higher risk of getting very sick or dying

How does the COVID-19 vaccine work?

- The USA has 3 vaccines to prevent COVID-19 (Pfizer, Moderna, Johnson & Johnson)
- Pfizer and Moderna are "COVID-19 mRNA vaccine," which refers to a portion of the genetic material from the virus called spike protein that causes COVID-19
- Johnson & Johnson is a "viral vector COVID-19 vaccine," which uses a vessel to deliver the genetic material for the COVID-19 spike protein
- ALL vaccines give the body instructions to make a specific piece of the spike protein that is normally found in the COVID-19 virus. In response, the immune system then makes antibodies that can recognize and attack the virus in the future
- Experts found that they ALL work extremely well, preventing about 66% (Johnson & Johnson) to 95% (Pfizer, Moderna) of infections
- ALL prevent severe illness (hospitalizations/death) at 99–100% efficacy
- These COVID-19 vaccines do **not** contain actual live virus. So they cannot give you the infection. They also do not cause your body to make live virus
- The Pfizer and Moderna vaccines require 2 doses given a few weeks apart. It's important to get both doses for the vaccine to be most effective. When to get the second dose depends on which vaccine you get
- Johnson & Johnson vaccine is only one dose

Side effects

Pain/swelling where you got the shot (upper arm) Fatigue
Fever/chills Nausea
Headache Vomiting/diarrhea

COVID-19 Education – Lesson #3

COVID-19 Household planning

What you need to keep with you:

- Keep household cleaning spray or wipes readily available. Always use according to label instructions
- Don't share personal items such as water bottles
- Throw away used tissues right away. If you use tissues to cover your cough or blow your nose, dispose of them in the nearest waste bin immediately after use, and then wash your hands
- Clean "high-touch" surfaces daily. These include counters, tabletops, doorknobs, light switches, bathroom fixtures, toilets, phones, keyboards, tablets, and bedside tables. Also clean any surfaces that may have blood, stool, or body fluids on them
- Keep an adequate supply of water, food, and pet food in your home. If you take prescription drugs, contact your healthcare provider, pharmacist, or insurance provider about keeping an emergency supply at home
- Cancel nonessential travel plans for anyone in the household

COVID-19 decision-making with self/family

COVID-19 Household planning

- Talk to caregivers/loved ones about backup plans in the event a primary caregiver becomes ill
 - Meet with immediate family, relatives, and friends to discuss possible needs in the event of an infectious disease outbreak
 - Create an emergency contact list of family members, friends, neighbors, healthcare providers, teachers, employers, and others
 - Get a flu shot this season if you haven't already. It won't protect against COVID-19, but it can help protect against flu or lessen symptoms if you get it, lessening the strain on healthcare facilities
 - Ask about your employers' preparedness plans, including sick-leave policies and telework options
 - Continue to postpone your attendance at large events, such as sporting events, conferences, and worship services, and to stay away from crowds
 - Identify community organizations that may be able to help if you need information, healthcare services, support, or other resources
- Prepare for possible changes in health-care. For example, medical advice and healthcare may be more difficult to obtain during a severe pandemic and healthcare providers and medical facilities may be overwhelmed. There may not be enough medical supplies, healthcare providers, and hospital beds for all persons who are ill
 - Difficult decisions about who receives medical care and how much treatment will be necessary. Talk about these possibilities with your family and loved ones
 - Think about how you would care for people in your family who have disabilities if support services are not available

COVID-19 Education – Lesson #4

Mental health

- Your feelings and emotions may have changed over the course of the pandemic; this is normal
 - Your resilience has shined through this pandemic. Your resilience is built on your ability to bounce back in difficult situations
 - Maintain a normal routine
 - Talk, listen, and encourage the expression of feelings/emotions
 - Be alert for any change in behavior
 - Look out for signs when you or friends and family might need more support
 - Model good self-care by taking care of yourself and making time for good sleep, healthy food, and relaxation
- Parent/child relationships**
- Children need one-on-one attention from an adult parent/caregiver to help them feel secure
 - oOpportunity for honest conversations about how kids feel
 - oOpportunity to reassure children and help them feel safe
 - It's okay for parents/caregivers to have alone time
 - oParents/caregivers need to process their own feelings/emotions in order to be there for their child/children

Healthcare access to the medical provider

Please make sure that you keep your appointments with your medical provider, via telemedicine (phone call or virtual visit) or in-person. You should still discuss any current or new health issues, nutrition, sleeping patterns, and overall general health and well-being

Ask your provider/doctor what measures the office has in place to protect you during an in-person visit. Efforts include:

- Increased cleaning and disinfecting of surfaces
- Daily health screenings for all staff and visitors
- Requiring everyone to wear a face mask
- Creating more space between chairs and tables in waiting rooms and cafeteria
- Limiting the number of visitors

Do not delay immunizations. Vaccines are given at a time in a person's life when they are at greater risk of getting a specific disease like the meningitis vaccine

Health behaviors

- | | |
|--------------------------------|-----------------------|
| Things to avoid/limit: | Things to do: |
| •Drug and alcohol use | •Healthy food choices |
| •Smoking – including marijuana | •Exercise |
| | •Sleep |

Author Contribution MB and SC were involved in the conception and design of the study. SA performed the data analysis and interpretation. AV, SA, SG, and MB together drafted the initial manuscript. All other co-authors were engaged in training therapists/social workers, collecting and computerizing, and analyzing and interpretation of data. All authors reviewed the manuscript critically for intellectual content and approved the submitted version.

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Availability of Data and Material The data sets used and analyzed in the current study are available from the corresponding author for collaborative studies.

Code Availability N/A.

Data Availability Personal identification details of the participants were separated from the completed questionnaires. The data were stored in a locked room at the Charles R. Drew University of Medicine and Science (CDU). No information relating to identifiable individuals was disseminated at all. The data sets used and analyzed in the current study are available from the corresponding author for collaborative studies.

Declarations

Ethics Approval Ethical approval for the study was obtained from the Institutional Review Committee of the CDU. Participants provided informed consent. The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees. IRB Approval Number [1697223-5].

Consent to Participate All adults who participated in this study were given information about the study including potential risks and benefits. A consent form significantly described the purpose of the study. Ample opportunity was allowed for participants and their family members to ask questions and to discuss what it meant. All participants signed the consent forms. Illiterate participants provided consent in the presence of a reliable or legally authorized family member.

Consent for Publication The consent form explained that those who participated also gave their consent to utilize the information in a non-identified format for scientific and popular publications.

Conflict of Interest The author declares no competing interests.

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