

ACCEPTABILITY AND FEASIBILITY OF USING VIRTUAL REALITY TO  
ADDRESS MENTAL HEALTH STIGMA WITH AFRICAN  
AMERICAN YOUNG ADULTS

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TACIA R. BURGIN

B.S., University of Kansas, Lawrence, KS, 2019

M.A., University of Missouri-Kansas City, 2022

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Tacia R. Burgin, Candidate for the Doctor of Philosophy Degree

University of Missouri-Kansas City, 2023

ABSTRACT

African Americans are disproportionately affected by mental illness compared to White Americans. Studies have reported that African Americans experience higher levels of mental health-related stigma (MHS) than White Americans, which among other cultural and socioeconomic factors (e.g., cost of healthcare, medical mistrust) may contribute to lower rates of professional mental health service use, limited discussion regarding mental health and increased use of unhealthy coping behaviors for mental illness. Virtual reality (VR), a computer-generated simulation of a three-dimensional image or environment, is emerging as a research tool that has been used to address several mental health conditions (i.e., anxiety, depression). VR has also been used to reduce stigma regarding racial bias, older adults and, more recently, MHS. Few studies have examined how VR can be used to

reduce MHS among ethnic minorities. Furthermore, no studies have examined VR use to address MHS with African American young adults. Guided by the Health Stigma and Discrimination Framework, this mixed methods approach study examined acceptability and feasibility of using VR to address MHS among 50 African American young adults aged 18 to 35. Focus groups and two brief surveys were administered to participants. Following discussion, participants performed a daily task while experiencing perceived MHS and common generalized anxiety symptoms (e.g., difficulty concentrating, fatigue) using a VR simulation. Participants endorsed moderate to high levels of MHS during baseline and slightly decreased MHS at post. Following the simulation, participants endorsed high levels of each VR measure (e.g., sense of embodiment and story transportation). Correlational analysis indicated a significant positive relationship between several constructs within each of the framework's domains and VR measures. Focus group data indicated common themes for each construct within the domains including fears (e.g., judgement, medication), social support (e.g., church, older generations), access to treatment (e.g., cost, availability of same race providers), and cultural/social norms (e.g., dismissive reactions, prayer). Focus group discussions indicated that participants better understood the viewpoint of someone with generalized anxiety following the simulation and endorsed commitment to changing personal MHS. These findings inform the potential design of future VR interventions to reduce MHS among African American young adults.

## APPROVAL PAGE

The faculty listed below, appointed by the Dean of the School of Education, Social Work, and Psychological Sciences, have examined a dissertation titled, “Acceptability and Feasibility of Using Virtual Reality to Address Mental Health Stigma with African American Young Adults” presented by Tacia R. Burgin, a Ph.D. candidate, and certify that it is worthy of acceptance.

### Supervisory Committee

Jannette Berkley-Patton, Ph.D., Committee Chair  
Department of Biomedical and Health Informatics

Melisa Rempfer, Ph.D.  
Department of Psychology

Kym Bennett, Ph.D.  
Department of Psychology

Joah Williams, Ph.D.  
Department of Psychology

James Mahoney Jr., PE  
Department of Computing and Engineering

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# CHAPTER 1

## INTRODUCTION

### **Mental Health in America**

The CDC (2018) has reported that 50% of adult Americans will be diagnosed with a mental illness in their lifetime. There has been an increase of mental illness diagnoses between 2019 and 2020 (CDC, 2020; Mental Health America [MHA], 2020; National Institute of Mental Health [NIMH], 2021). The most prevalent mental illnesses include depressive disorders (affecting approximately 7% of the U.S. population) and anxiety disorders (affecting approximately 19% of the U.S. population; National Alliance on Mental Illness [NAMI], 2019). Additionally, suicide represents the 10<sup>th</sup> leading cause of death in the U.S., and rates have continued to grow, especially in racial/ethnic minority populations and African American youth and young adults (NIH, 2020; Ramschand et al., 2021; Fickman, 2022). Furthermore, reports have indicated that over 20% of Americans report an unmet need for mental health treatment (MHA, 2020).

The SARS-CoV-2 (COVID-19) pandemic also had a large impact on mental health among U.S. adults. Potential causes of this included extensive quarantine regulations, increased anxiety due to side effects, and increased grief (Panchal et al., 2021). Additionally, during the pandemic, higher rates of loneliness, a factor predictive of mental illness symptoms, were reported by young adults, aged 18 to 30 (Liu et al., 2020). Reports have also indicated that nearly 11% of adult Americans reported contemplating suicide 30 days prior to completing three web-based surveys, administered by Qualtrics, in June 2020; 19% of these respondents were of Hispanic origin, and 15% were non-Hispanic Black Americans (Czeisler

et al., 2020). Furthermore, the Common Wealth Fund reported that, at the onset of the pandemic, Latin Americans (40%) and African Americans (39%) were more likely to have concerns about mental health compared to White Americans (29%) (Common Wealth Fund, 2020). Lastly, victimization and racial predispositions associated with COVID-19 were related to increased levels of depression and anxiety among American Indian/American Native, Asian, Latinx and Black young adults (Fisher et al., 2022).

### **Mental Health and African Americans**

African Americans represent 13% of the population and made up 16% of U.S. adults affected by mental illness in 2020 (MHA, 2020). Furthermore, the highest prevalence rate (30.6%) of any mental illness in 2020 was found in young adults, aged 18-25, compared to all other adult aged populations (NAMI, 2020). Other mental health illness disparities experienced by African Americans and African American young adults are described below.

**Depression.** Compared to White people, the lifetime prevalence rate of depression among African Americans is reported to be lower. However, African Americans may be more likely to battle with persistent and severely impairing depression (Bailey et al., 2019). Additionally, depression rates have increased from 2015 to 2018 among young adults (from 6.1% to 9.4%) and African American youth (from 9% to 10.3%; MHA, 2020). One study that explored depression rates between African American and White females in college (aged 18 to 25) found that African American females were more likely to endorse greater amounts of depressive symptoms and were more likely to meet criteria for Major Depressive Disorder (MDD; Longmire-Avital & Robinson, 2018). Literature reports that depression among African Americans is often undiagnosed even after requesting treatment. For example, Saucedo et al. (2021) have found contributing factors to misdiagnosis and underdiagnoses of

depression among African Americans includes the increased presentation of somatic symptoms opposed to classic psychological symptoms. Studies have reported that African Americans with MDD often show more somatic symptoms, such as insomnia, restlessness, and early morning awakening, compared to their White counterparts (Hankerson et al., 2011). Furthermore, African Americans living with depression often have more difficulties with other health conditions (e.g., hypertension, cardiovascular disease, liver disease, arthritis, obesity; Hankerson et al., 2011; Watkins et al., 2015) that disproportionately affect African Americans and can contribute to depression (American Heart Association, 2009; Chapman et al., 2005; Hankerson et al., 2011).

**Anxiety.** Anxiety symptoms have more than tripled for African Americans, from 8% to 34% since 2019 (Fowers & Wan, 2020). A separate study found varying rates across anxiety disorder types among African Americans (social anxiety: 9%; generalized anxiety: 5%; panic: 4%; post-traumatic stress disorder [PTSD]: 9%; The Recovery Village, 2020). Anxiety disorders are among the most prevalent mental health disorders among African American young adults (aged 18 to 29; APA, 2021). This could be due to the increased exposure to social issues experienced by African American young adults that can contribute to symptoms or risk factors for anxiety (e.g., victimization, oppression, discrimination, homelessness, exposure to violence; Anxiety and Depression Association of America [ADAA], 2020; Himle et al. 2009; Williams, 2018).

**PTSD.** PTSD is more common among African Americans, with a lifetime prevalence of around 9% compared to White Americans at around 7% (Spottswood et al., 2017; The Recovery Village, 2020). Studies indicate that African American youth may be at a greater risk for PTSD compared to other races by over 25% due to high exposure to community

violence (ADAA, 2020). Additionally, African American adolescents and young adults are more likely to experience physical forms of violence compared to White adolescents, and African American adults tend to report a greater number of Adverse Childhood Experiences (ACEs), a measure assessing adversities prior to turning 18 that impact long-term health, compared to White adults (Sheats et al., 2018). Lastly, a study with nearly 310 million participants found that African Americans and other ethnic minority groups, uninsured individuals, and those living in low-income areas were less likely to seek trauma care for PTSD compared to others (Carr et al., 2017).

**Substance use.** The 2018 National Survey on Drug Use and Health found that over 7% of African Americans had a substance use disorder, which is similar to 7% of the general U.S. population (Substance Abuse and Mental Health Services Administration [SAMHSA], 2020). They also found that, compared to 3% of the total population, almost 4% of African Americans had an illicit drug use disorder. Although the literature has reported that White adults are the majority users of illicit drugs in the U.S., research also suggests that African Americans are less likely to be prescribed opioids for pain compared to their White counterparts (SAMHSA, 2020). However, a separate national study found that over 13% of African Americans engaged in illicit drug use compared to White Americans at 12% in 2018 (Kaliszewski, 2020). One study using data from the National Longitudinal Study of Adolescent Health with over 20,000 participants, found that drug use increased from early adolescence to mid-20's for all participants. The same study found that African Americans continue to engage in smoking after the age of 30 unlike other races/ethnicities (Chen & Jacobson, 2012). Elevated ACE scores, which are common among African Americans, have also been found to be associated with increased mental illness symptoms and substance use

(Mersky et al., 2013). Furthermore, substance and illicit drug use are more prevalent among African American individuals with mental health issues compared to those without mental health issues (MHA, 2020).

**Suicide.** The CDC has found that age-adjusted suicide rates have decreased from 2018 to 2019 in the U.S. (Kochanek et al, 2021). However, a separate study using data from the National Vital Statistics System found that the suicide rates increased by 47% for African American male youth compared to a decrease in White male youth within the same year (Ramchand et al., 2021). Suicide is the third leading cause of death for persons aged 1 to 19 years old and the fourth leading cause for persons aged 20 to 44 years old (CDC, 2020). Studies have shown that risk factors for suicide among African Americans include substance use, racism and discrimination, mood and anxiety disorders, and prior suicide attempts (Suicide Prevention Resource Center, 2018). Also, African Americans who identify as lesbian, gay, bisexual, transgender, and queer (LGBTQ+), particularly youth, tend to be at a greater risk for suicidal behavior. For example, Price-Feeney et al, (2020) found that 44% of African American LGBTQ+ youth participants considered suicide, and 18% attempted suicide in 2019. Additionally, African Americans living at or below the poverty level are twice as likely to report serious psychological distress which may result in suicide (Office of Minority Health, 2021).

The literature indicates that disproportionate rates of several mental illnesses (e.g., chronic MDD, PTSD, substance use disorder, suicide among specific African American populations) exist for African Americans and the level of unmet need for professional mental health services is higher among African Americans compared to White Americans of any age (Alang, 2019). There are several factors contributing to mental health inequities among

African American young adults such as age, medical mistrust, limited access to information and services, underdiagnoses and MHS (Hankerson & Weissman, 2012; Heath, 2017; Phelan et al., 2019).

### **Factors Contributing to Mental Health Inequities Among African Americans**

**Age.** Although data are not reported on White people among the following age groups, SAMHSA's 2018 National Survey on Drug Use and Mental Health reported differences in depression rates across African American age groups, with the highest rates found in adolescents aged 12 to 17 (10%) and aged 18 to 25 (9%); MHA, 2020).

Furthermore, African American adolescents have reported being more likely to distance themselves from peers with a mental illness (Dupont-Reyes et al., 2019). Research also indicates that African American young adults (aged 18 to 34) had lower professional mental health service seeking rates (68%) compared to their White counterparts (Marrast et al., 2016). Potential reasons for this include a preference for more familiar methods of mental health care (e.g., religious counsel; Christensen et al., 2017), limited access to care, medical mistrust, and MHS. The same study also reported that minority youth and young adults' behavioral concerns tended to lead to school punishment or imprisonment, opposed to professional mental health service seeking (Marrast et al., 2016).

**Medical mistrust.** Another contributing factor to mental health inequities among African Americans is mistrust in professional mental health care providers (Hankerson & Weissman, 2012). For example, a study by Conner and colleagues (2010) reported that African American participants often worried about treatment methods and having a provider of a different race and ethnicity. Other studies have also reported that African Americans tend to have more trust in and prefer same race/ethnicity health care professionals (e.g.,

Goode-Cross & Grim, 2014). Additionally, literature suggest that African American youth have a lack of trust in their mental healthcare provider due to prior negative experiences with treatment (Planey et al., 2019). African American parents of youth may also experience medical mistrust. Studies with African American parents have reported that they believe that White mental health professionals treat white children better than African American children or do not understand African American family dynamics (e.g., Murry et al., 2011). Studies have also reported that when African Americans have a provider of the same race and ethnicity, the level of perceived discrimination, racism, and bias in receiving health care services decreases (Huerto, 2020). However, most professional mental health care providers are non-Hispanic and White (76% of all psychiatrists, 95% of all psychologists, 80% of all counselors, and 90% of all psychiatric nurses; Buche et al., 2017). Consequently, finding an African American provider may be challenging. NIMH is attempting to address these issues with its strategic plan to increase diversity and inclusion within mental health professions with a grant mechanism entitled NIH Neuroscience Development for Advancing the Careers of a Diverse Research Workforce (R25). This plan has been created to encourage individuals from underrepresented communities to seek careers in neuroscience and biomedical/behavioral science research, and to address concerns regarding representation and the ability to select same race/ethnic mental health providers (NIMH, 2020).

**Limited access to mental health information and services.** Racial/ethnic minorities are also at risk for low health literacy (e.g., ability to find, or permit individuals to find, comprehend, and use information and services to advise health related decisions; CDC, 2021), which may be impairing to professional mental health service access. A 2003 National Assessment of Adult Literacy survey found that African Americans (58%) reported basic or

low health literacy (Muvuka et al., 2020). A separate study found that African Americans had more trouble recognizing mental illness symptoms compared to other races (Alegría et al., 2012). Muvuka and colleagues (2020) report that there are social issues that may make it challenging to access health information and services such as discriminatory practices and systemic factors (e.g., limited informative opportunities, racism, distrust in the health system, lack of culturally tailored health information). Planey et al.'s (2019) review of mental health service seeking with African American youth and their families reported that youth and their parents had difficulties in accessing mental health services due to lack of information of where to find these services and lack of insurance coverage. In addition, compared to White Americans earning a median household income of \$77,999, African Americans tend to have lower median household incomes at \$48,297 ( ) and have challenges accessing professional mental health care due to the cost of services (Kawaii-Bogue et al., 2017).

When examining the average cost of care for annual health insurance (e.g., \$7,188 for single coverage, \$20,576 for family coverage) compared to the median annual household income for African Americans (\$42,000) compared to White Americans (\$68,000) in 2018 and 2019, (Kaiser Family Foundation, 2019; Leonhardt, 2019), the African American household income could theoretically be consumed by health insurance expenses (U.S. Census Bureau, 2021). Additionally, only a percentage of mental health services expenses are covered by health insurance policies (Miner, 2020). For example, a 2019 Kaiser Family Foundation (KFF) survey reported that employers paid an average of 82% of health insurance for single coverage and 70% for family coverage (KFF, 2020), which could leave a significant financial burden for the uncovered coverage for mental health services, particularly for African Americans. Parents of African American youth report finances to be

a critical barrier to seeking mental health services for their children (Planey et al., 2019). For example, one study found that parents would consider paying for other immediate concerns within the family before considering paying for mental health services for their child (Lindsey et al., 2013). Other studies have found that parents of African American youth have concerns that professional mental health services may be too expensive (Murrey et al, 2011) or their mental healthcare provider does not accept Medicare or Medicaid (Mukolo & Helfinger, 2011).

Transportation is another barrier African Americans may face when accessing professional mental health services (Kawaii-Bogue et al., 2017). Sharma and colleagues (2017) examined geographic access to professional mental health services in California. They found that it was more likely for mental health care facilities to be in high-income, predominantly White areas compared to low-income racial minority areas, suggesting racial minorities and/or those living in lower-income areas may have to travel longer distances to receive professional mental health services.

**Underdiagnoses when treatment is sought.** Studies reported several contributing factors to underdiagnoses of mental health illnesses among African Americans, such as provider bias, mental illness symptoms presentation differences, and misdiagnosis (Bailey et al., 2019). For example, one study examined electronic medical records (N=1,657 total; 36% African American) from a community behavioral health clinic and found that 19% of African Americans who screened positive for MDD were more likely to be misdiagnosed with schizophrenia compared to White Americans at 3% (Gara et al., 2019). African Americans have been half as likely to be screened for depression compared to their White counterparts despite the procedures primary care physicians have in place for routinely screening for

various mental health concerns (Akincigil & Matthews, 2017). Moreover, African American youth are more often diagnosed with psychotic (e.g., schizophrenic spectrum disorders) and disruptive behavioral disorders (e.g., conduct disorder) compared to White youth who are more likely to receive a mood, anxiety, depression and bipolar disorder diagnosis when presenting with similar symptoms (Liang et al., 2016). Liang and colleagues (2016) conclude that these underdiagnoses, or misdiagnoses, could be due to parental misinterpretation, minimization or exaggeration of symptoms, or parents being less prepared with important information about their child's symptoms.

**MHS.** Stigma has been defined as “an attribute that is deeply discrediting” and minimizes a person “from a whole and usual person to a tainted, discounted one” (Goffman, 1963, p. 3). Studies suggest that among African Americans, stigma related to mental health is considered to lead to limited professional mental health treatment seeking, limited discussion with others regarding mental health and increased use of unhealthy coping behaviors for mental illness (Conner et al., 2010; Hankerson & Weissman, 2012; Williams et al., 2014). Research has found that social support, collaborative and self-directive religious coping, and engaging in religious activities (e.g., thinking of God, meditating, praying) are significantly related to MHS (Burgin, 2022). African American populations may believe that mental illness is a weakness (Ward et al., 2013), God will keep them healthy (Neely-Fairbanks et al., 2018), mental illness is a choice or personal problem, African Americans do not experience mental illness due to biological differences, and African American youth do not have mental health issues (Villines, 2020). African American young adults have also been found to endorse these stigmatized beliefs.

**MHS among young adult African Americans.** Goodwin and colleagues (2016) conducted a mixed methods systematic review examining adolescents' and young adults' beliefs about mental health services and found that viewing film images (e.g., movies, theatre productions) of persons receiving mental health services increased negative perceptions of individuals with mental health conditions. The study also found that speaking with family members was associated with decreased positive perceptions. Lastly, they found that many participants had negative views towards mental health facilities and professionals, believed seeking mental health services was a weakness, and that culture, specifically cultures where prayer was highly valued, had a large negative influence on youth's perceptions of mental health services.

A separate systematic review examining the relationship between religiosity, suicidality, suicide related stigma, and mental health service utilization among Black Americans, found that religiosity was a protective factor against suicidality among the general Black American population, while also having a negative impact on beliefs about seeking mental health services among Black Americans and African American youth (Fanegan et al., 2022; Planey et al., 2019).

Planey and colleagues (2019) found, in their mixed review with African American youth and their families, that “gatekeepers” (e.g., parents, teachers, clinicians) of depressed African American youth believed that “lack of information about depression and mental illness from the pulpit” (Breland-Noble et al., 2011, p. 230) was a barrier to seeking professional mental health services. However, the same review also found that religiosity could be a facilitator of mental health service use due to youth stating that adults in their faith community support them in seeking services (Planey et al., 2019). Additionally, the

researchers found that youth would not seek or would stop participating in mental health services because of previous negative comments regarding mental health from their family and community (e.g., “people can grow out of whatever mental health issues they think they may have”; Samuel, 2015, p. 39). They also believed that friends and family would tease them or be offended that they sought professional help. Caregivers reported to be fearful of being stigmatized within their community, being blamed for their children’s mental health concerns, and their children being labeled as “crazy” (Planey et al, 2019).

Masuda (2012) examined treatment seeking attitudes among African American college students and found that MHS and self-concealment, the act of refraining from discussing distressing personal information, were associated with more negative treatment seeking attitudes. They also found that older students and students with prior experience with mental health professionals were more likely to seek treatment compared to younger students and those without prior experience with a mental health professional.

**MHS interventions.** Although researchers have examined several health and MHS factors among African Americans, there are few MHS interventions in the literature that have been culturally tailored for African Americans. Even fewer of these intervention studies focus on African American young adults. Brown (2009) examined a faith-based educational program among African American adults in an African American church (N = 38). The intervention included 90-minute workshops aimed at increasing mental health literacy and decreasing MHS. The church chose specific topics they were interested in learning about (e.g., depression, dementia) and the workshops included testimonials from families and other faith-based communities. The researchers found a significant decrease in MHS and an improvement of attitudes toward mental illness among participants. Vinson and colleagues

(2016) examined two mental illness stigma intervention delivery methods with African American undergraduate students (N = 158). The interventions included in-person contact with an African American man who discussed mental illness, specific mental health concerns prevalent among African Americans (e.g., medical mistrust, being perceived as “weak”) and his psychotherapy experiences while a recording of this discussion was given to the control group. Although the researchers found no significant difference across the two groups from preintervention to postintervention, they did find a decrease in negative beliefs about individuals with mental illnesses, which was not maintained at two weeks and returned to preintervention levels. They also found that participants reported a decrease in desire to socially distance themselves from individuals with mental illnesses from preintervention to postintervention, which was maintained at two weeks. MHS beliefs and behaviors are often related to mental health inequities (e.g., under/misdiagnosis, lack of service seeking) among African Americans and African American young adults. The sparse literature suggests that culturally tailored MHS interventions for African Americans have potential to decrease MHS beliefs and behaviors. However, there is a lack of research on MHS interventions for African American young adults, and intervention strategies tailored for this population are needed.

The importance of culturally tailored interventions, specifically mental health interventions, for African Americans has been widely emphasized in the literature. Research has found that cultural factors such as stigma, beliefs about mental health, and experiences with systemic racism play a crucial role in shaping mental health attitudes and behaviors among African Americans (Hankerson et al., 2018). Therefore, culturally tailored interventions that take these factors into consideration have potential to increase their effectiveness and make them more acceptable to this population (DeFreitas et al., 2018). By

incorporating cultural considerations into mental health interventions, health care providers can increase the likelihood that these interventions will resonate with and effectively address the unique mental health needs of African Americans (White, 2019).

**Virtual reality (VR).** There is much to learn in identifying innovative strategies to address MHS with African American young adults. Virtual reality (VR) is a common entertainment experience used by young adults that has potential to reduce MHS with this young adult population. VR is as a computer-generated, fully immersive, three-dimensional experience that can be similar or completely different than a real-world experience. A common way that VR is experienced is in the use of a VR headset (e.g., Oculus Quest) that plays a three-dimensional VR video game (e.g., beat saber, Half-Life: Alyx, Minecraft VR). Currently, VR has been adopted in approximately 23 industries such as real estate, architecture, learning and development, education and healthcare (Thompson, 2022). Furthermore, the healthcare industry is expected to have the most increased demand for VR compared to other industries and is projected to exhibit a compound annual growth rate (CAGR), average annual amount VR usage will grow, of around 38% by 2028 (Fortune Business Insights, 2021). Approximately 171 million people worldwide use VR in some form, including 57 million U.S. users in 2020 (Blagojević, 2022; Petrov, 2022).

**VR and young adults.** Young adults are among the most frequent users of VR technology (e.g., head mounted display [HDM], computer or video game console or display). On average, individuals between the ages of 16 to 34 are more likely to use VR technology compared to other age groups (Blagojević, 2022). More specifically, 34% of persons 16 to 24 years old and 35% of those 25 to 34 years old have reported use of VR, whereas only 26% of persons 35 to 44 years old and 18% of those 45 to 64 years old have done so. Previous

research examining VR usage between young and older adults found significant differences. For example, Plechatá and colleagues (2019) examined using a VR shopping simulation either through head-mounted displays or through a non-immersive desktop experience with young and older adult samples and found older adults had better performance using the desktop. Young adults had the same level of performance regardless of type of display, and both young and older adults reported similar user experiences.

Additionally, Liu and colleagues (2020) conducted a mixed methods study that examined viewing a short scenic documentary, either through VR headwear or on a smartphone, with undergraduate students and older adults. The researchers found older adults were more likely to mention feelings of fear, intensity, physical discomfort, surreal-ness and strangeness compared to students. They also found that the older participants thought the devices were too hard to operate, and that VR should be limited to entertainment industries. Students were more likely to mention positive feelings of privacy, thinking that virtual telepresence could replace physical telepresence and that VR technology could be used in various industries (e.g., driving, aerospace, education, business applications, social sciences). However, Liu and colleagues (2020) also found the older adults' group to have a higher level of perceived telepresence in both tasks, more positive attitudes toward the video, and they explained their telepresence in stronger ways (e.g., "My heart and mind are totally in the video..."; p. 6) compared to the students (e.g., "There is a sense of presence"; p. 6). This could be due to the students' increased level of experience with VR and other technologies.

One indication that using VR to address mental health concerns would be acceptable among young adults includes their wide usage of information technologies and telehealth services. In 2013, individuals aged 24 and younger represented about 42% of the world's

population and 45% of internet users (United Nations, 2015). Individuals aged 25 and younger were more likely to use new information technologies compared to other age groups (United Nations, 2015). Additionally, 26.3 million adults received virtual mental health services in 2020 (NAMI, 2020), and nearly 27% of respondents to the Census Bureau's Household Pulse Survey reported using telehealth services in 2021 (Karimi et al., 2022). Although individuals with Medicare (27.4%), Medicaid (29.3%), low income (26.7%), and African Americans (26.8%) had the highest rates of overall telehealth (e.g., audio and video) visits in 2021, these individuals also had the lowest rates of *video* telehealth visits (Karimi et al., 2022). Additionally, young adults represented nearly 73% of individuals who used video telehealth services compared to audio telehealth (Karimi et al., 2022). These findings suggest that using video technology, specifically VR technology, has potential to be largely acceptable to address MHS and other mental health concerns among African American young adults. Although no studies have used VR with African American young adults to examine mental health concerns, several studies have examined use of VR technologies in mental health assessments and interventions with young adults.

**VR mental health assessments.** VR has previously been used to assess mental health concerns, including anxiety, PTSD and schizophrenia, through various VR simulations with the general adult and young adult population. Powers et al. (2013) used VR to assess social anxiety disorder (SAD) symptoms with undergraduate students. The VR simulation consisted of having each participant engage in a conversation with an avatar. They found that participants who had VR conversations had higher levels of fear compared to participants who had in-person conversations, and in-person conversations were rated as more realistic. Another study examined using VR to assess general anxiety through a VR simulation with

university students aged 18 to 39. Participants engaged in public speaking, either with an avatar representative of themselves or someone unknown, (Aymerich-Franch, L. et al., 2014). They found that lower anxiety was associated with having an unknown avatar but having an unknown avatar did not reduce anxiety while giving a speech.

Additionally, Freeman and colleagues (2014) used VR to assess paranoia. These researchers examined the effect of manipulating participants' height through VR on paranoia. The participants sat through a simulation riding a train at each person's normal height and then later at a reduced height. The results indicated that reduced height or negatively comparing themselves to other avatars on the train fully explained the increase in paranoia across participants. Another study conducted by Freeman and colleagues (2008) examined predictive factors of paranoia by manipulating a similar train ride using a VR simulation. In this simulation, the participants rode the train and briefly interacted with the avatars on the train (e.g., looking at avatars and receiving a smile). They found that predictors of paranoia included catastrophizing worry (i.e., worrying the worst-case scenario), perceptual anomalies (i.e., distortions in interpretations of the sensory experiences), and cognitive inflexibility (i.e., inability to switch between modes of thinking or to adapt to changes). Overall, the literature indicates that VR can be used to assess anxiety and paranoia symptoms, however more research is needed on continued use of VR to assess and treat other mental illnesses.

**VR mental health interventions.** Systematic reviews of the literature suggest that VR has been used to decrease symptoms of mental illnesses such as anxiety, depression and PTSD (Rowland et al., 2021; Grochowska et al., 2019). For example, a study by Bouchard et al. (2017) examined the use of administering cognitive behavior therapy (CBT) with VR for SAD symptoms among Gatineau, Québec, and Canadian adults (N = 59). The VR simulation

exposed the participants to eight stressful scenarios (e.g., job interview, refusing a persistent seller, speaking in front of an audience). The results indicated that conducting CBT with VR was a feasible way to treat SAD and that results of decreased SAD symptoms were maintained at 6 months (Bouchard et al., 2017). Strengths of this study include its ability to compare in-person and virtual CBT across several different social scenarios. However, the study had a small sample size restricting generalizability, and there were discrepancies between the two conditions, such as the in-person exposure included either role-playing or guided exposure to different scenarios (e.g., wearing two socks of a different color in public, asking strangers on a date) compared to those included in the virtual exposure.

Haldorsson's et al. (2021) systematic review examined the effect of applied games on mental illness symptoms among youth (18 and younger), the majority of whom were located in the United Kingdom, Netherlands, and New Zealand, and found a significant decrease in depressive symptoms (n = 2 to 187). For example, several studies in this review used a game, called SPARX (Smart Positive Active Realistic X-Factor), with real world images and digital overlays to incorporate artificial objects. This game consisted of treating mild to moderate depression with adolescents by delivering CBT (e.g., relaxation and interpersonal skills, activity scheduling, distress tolerance, cognitive restructuring) while having the participant restore balance to the fantasy world created. At post-treatment, the studies that used SPARX found that participants were more likely to be in remission and have lower depressive symptoms compared to the wait list control group (Fleming et al., 2012; Fleming et al., 2016; Merry et al., 2012). A strength of these studies includes the studies' measurement of game adherence, acceptability, and experience. For example, Merry et al. (2012), found that majority of their participants reported that SPARX would appeal to other

adolescents. In Fleming et al's. 2016 study, participants reported that SPARX was able to "transform thinking", were "easy to learn from" and may be "boring if you do not need it". However, there were no reports comparing SPARX to CBT delivered in its usual length and format.

Haldorsson and colleagues (2021) reported on three interventions examining two VR applications (N = 9 to 41). One of the intervention studies included the examination of a series of social related VR environments (e.g., giving a speech in front of a virtual audience, attending a virtual party) and how these environments may affect anxiety symptoms among children and adolescents with autism spectrum disorder (ASD) and with social phobias (Maskey et al., 2014; Maskey, Rodgers et al., 2019). The researchers found small to medium within-group effects for children's self-reported and parent-reported symptoms of anxiety. However, those who used VR had few changes in fear and anxiety symptoms, and VR had no statistically significant advantage over participants in the control group (Maskey et al., 2019). Although these studies were able to examine and measure participant's VR experience, there was no significant difference between using VR and the control group in treating anxiety symptoms.

Rowland and colleagues' 2021 systematic review assessed studies that examined VR interventions for emotional disorders (e.g., anxiety disorders, specific phobias, agoraphobia, mood disorders, unipolar depressive disorders) with a clinical population of adults (the majority located in Europe). They found that, among the studies reviewed, VR was effective in treating anxiety and PTSD. For example, Freeman et al., (2018) created an animated virtual coach to guide participants through VR exposure therapy compared to usual care (e.g., no treatment or in-person therapy) for a fear of heights with adult participants diagnosed with

acrophobia (N = 100). The virtual coach provided psychoeducation regarding acrophobia and guided the participant through exposure scenes (e.g., 10-story office complex with activities for each floor) while assessing for the participants' perception of their fear. The researchers found a reduction in fear of heights with results being maintained at a four-week follow-up. Lindner et al., (2019) examined the effect of one session self-led or therapist-led VR exposure on adult participants with SAD (N = 45). The participants were exposed to simulations causing them to engage in a VR public speaking activity followed by a four-week transition program from VR public speaking to public speaking in person. The researchers found that both treatments resulted in large, immediate improvement in public speaking anxiety, which were maintained or improved at six and 12-week follow ups. A strength of these studies includes their comparison between using VR with the assistance of another person (e.g., therapist) and without (e.g., remote). A limitation is that these studies did not examine the treatment experience based on user engagement, treatment satisfaction, sense of embodiment, story transportation, or general attitudes toward VR.

Overall, there have been a considerable number of mental health interventions for adult and youth populations. These interventions indicated that using VR to address mental health concerns can be effective and accessible. The researchers were also able to measure the participant's experiences with the VR simulations and technology. However, the studies did not measure participant VR experiences with validated and reliable scales used in previous studies, had small sample sizes, and did not include the young adult population. Also, while there is emerging research regarding the benefits of using VR for treating mental health concerns, there are limited studies regarding addressing MHS.

**VR and stigma reduction interventions.** Despite the emerging studies on VR and mental health interventions, only one study could be found on use of VR in a MHS reduction intervention. A study by Yuen and Mak (2021) examined the use of VR to address public MHS with college students in Hong Kong (N= 206). They created a VR simulation where their participants would view scenarios from the point of view of a character, named Yan, who experienced mixed anxiety and depressive disorder. One specific scenario in the simulation had Yan receiving a visit from her uncle who stigmatized mental health. While her uncle was speaking, Yan's view of her environment would shrink while everything around her got larger and taller to illustrate inferiority. Sense of embodiment – the ability of the participant to feel that they are the character they see in the simulation, was measured using a seven-item scale to specifically fit their study and included questions about ownership and agency. They also measured story transportation – how well the story in the simulation was understood by the participant, with the Transportation Scale- Short Form (Green & Brock, 2000). The researchers found a significant reduction in public stigma with the VR group as well as with a text and audio narration group compared to a no-activity control group. Studies have examined using VR for other stigmas, such as racial biases (Peck et al., 2013) and stigma against older adults (Yee & Bailenson, 2006). For example, Peck and colleagues (2013) examined racial bias with “light-skinned” female college students of Spanish origin (N = 60) by having them embody different skin tones through VR and found that implicit racial bias decreased when this occurred. Additionally, Yee and Bailenson (2006) examined negative stereotyping of older adults among undergraduate students through perspective-taking by using VR to embody the participant in an older person's body and

found reduced elderly stereotyping. However, there are no studies examining the use of VR to reduce MHS among young adult African Americans.

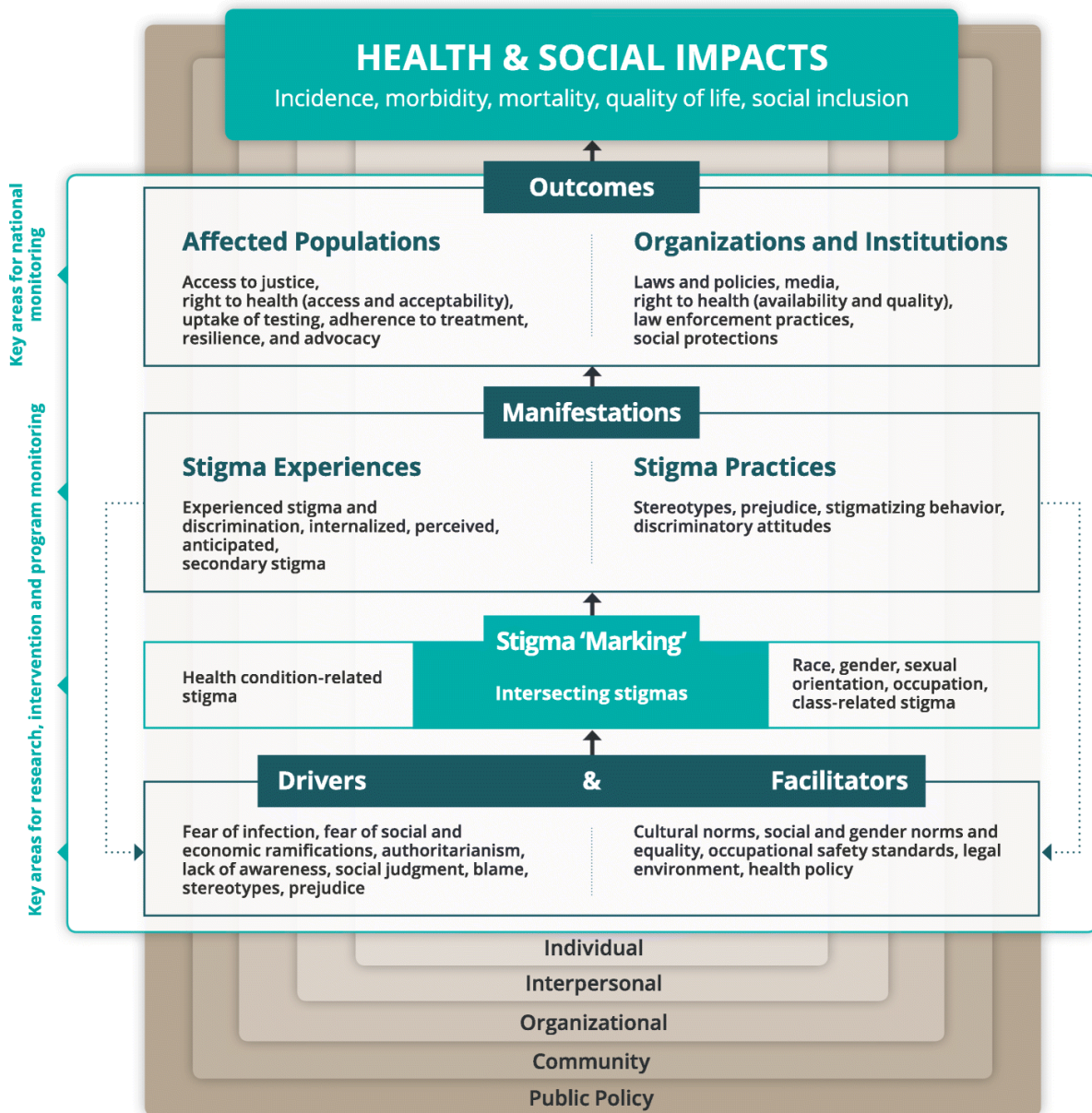
Novel research strategies are needed that can not only explore MHS with African American young adults but that can also do so in a culturally appropriate manner to enhance the acceptability and feasibility of future MHS interventions. The Health Stigma and Discrimination Framework (Stangl et al., 2019) is a potential model to help expand the understanding of MHS and inform the design of MHS interventions for African American young adult populations using VR.

### **The Health Stigma and Discrimination Framework**

According to Corrigan and Rao (2012), there are two forms of health-related stigma including: self-perceived stigma (internalizing beliefs of being stigmatized based on personal illness) and public stigma (being stigmatized or stigmatizing others due to illness). Highly stigmatized groups in society include people living with disabilities, members of racial/ethnic minority groups and individuals who are HIV positive. Members of highly stigmatized groups are more likely to develop mental health problems (Dinos, 2014; Parker & Aggleton, 2003), and one of the most stigmatized groups in society are those with a mental illness (Stuart, 2008; WHO, 2001). Between 2007 to 2017, research indicates that MHS has had a significant decrease (from 64% to 46% perceived and 11% to 6% personal: American Psychiatric Association [APA], 2018). However, most individuals, specifically ethnic minority populations, are still burdened by MHS in the form of limited professional mental health treatment seeking (APA, 2017).

Stangl and colleagues (2019) created a framework to assist the development of health-related stigmatization reduction interventions, such as mental health. The Health

Stigma and Discrimination Framework (Stangl et al., 2019) explains the stigmatization process by identifying four primary domains: drivers and facilitators, stigma “marking”, stigma manifestations, and outcomes. This framework defines *Drivers* as negative thoughts and behaviors related to health, such as fear of catching an illness from someone with a stigmatized health condition or beliefs that those individuals are dangerous and should be ashamed. *Facilitators* are defined as positive and negative external influences on behaviors such as cultural, social, and gender norms, as well as occupational safety standards and health policy. The occurrence of Stigma Marking, which is the application of stigma to individuals or groups based on their differences, is determined by these Drivers and Facilitators. *Stigma manifestations*, including experiences of discrimination, self-stigma, and perceived stigma, result from Stigma Marking and lead to negative health outcomes like low self-efficacy, self-esteem, and quality of life, as well as lack of treatment seeking.



**Figure 1. The Health Stigma and Discrimination Framework**  
(Stangl et al., 2019)

## **The Health Stigma and Discrimination Framework: A Guide to Examine MHS Among African Americans**

Created to be used universally and across various highly stigmatized health conditions (e.g., HIV, cancer, mental health), The Health Stigma and Discrimination Framework can assist in examining predictive factors of MHS specifically when tailored for populations who previously have reported poor mental health outcomes (e.g., LGBTQ+ community; Banerjee & Nair, 2020). Two studies examined stigma using the Health Stigma and Discrimination Framework. Nwanaji-Enwerem (2022) and colleagues conducted a systematic review examining stigma and sleep deficiencies (e.g., duration, continuity/efficiency, quality) and found that self-reported sleep deficiency was associated with internalized, perceived and anticipated stigma. Additionally, a qualitative study examining LGBTQ+ Hispanic and non-Hispanic White women's stigma among healthcare professionals and found probable causes of LGBTQ+ stigma (e.g., cisnormative medical training, lack of organizational policies and procedures to prevent stigma/discrimination) and that drivers and facilitators contributed to manifestations of stigma practices such as discriminatory attitudes or treatment and prejudice). Stangl and colleagues (2019) have reported that there may be differences in MHS severity based on race (e.g., greater embarrassment for Somalian participants compared to African American participants when seeking mental health treatment) and gender (e.g., public stigma may be perceived as higher for men with mental illness compared to women, specific mental illnesses are seen as masculine [e.g., antisocial personality disorder] or feminine [e.g., eating disorders]). Table 1 below demonstrates how the framework's four domains can be tailored to examine MHS among African American.

**Table 1**

*Adapted Framework Domains for Mental Health-Related Stigmatization among African American Young Adults*

<b>Drivers</b>	<b>Facilitators</b>	<b>Stigma Marking: Intersecting Stigmas</b>	<b>Manifestations (Stigmatizing Practices)</b>
<ul style="list-style-type: none"><li>• Fears (Mental health issues)</li><li>• Awareness (Mental health)</li><li>• Social support (Mental health services)</li></ul>	<ul style="list-style-type: none"><li>• Cultural norms (Religious beliefs and behaviors)</li><li>• Social norms (Discrimination)</li><li>• Equality (Access to mental health services)</li></ul>	<ul style="list-style-type: none"><li>• Demographics<ul style="list-style-type: none"><li>• Age</li><li>• Gender</li><li>• Sexual orientation</li><li>• SES (education; health insurance)</li></ul></li><li>• Mental health conditions</li></ul>	<ul style="list-style-type: none"><li>• Mental health-related stigma beliefs (Stereotypes and prejudices)</li></ul>

**Drivers**

**Fears about mental health issues.** Previous studies have found that many African Americans withhold mental illness symptoms or diagnoses from family and friends. Reasons for this behavior may include worry of hurting their family, damaging their career, concerns that others will perceive them as “crazy”, concerns of being labeled as weak, increased shame, and fear (Neely-Fairbanks et al., 2018). In their review, Pescosolido and Martin (2015) report that many Americans fear that people with mental illnesses are a danger to others, they prefer to detach themselves from those with mental illness and to not be identified as someone with a mental illness. A separate study examined African American’s attitudes regarding mental illness and treatment seeking and found that a key barrier to treatment seeking was fear of being shamed by others and unsolicited vulnerability (Avent

Harris et al., 2020). Studies have also stated that African Americans may fear that a mental illness is an extremely severe health condition, and therefore, one must endure extremely severe treatment when seeking help (e.g., inpatient hospitalization; DeFritas et al., 2018).

Other fears regarding mental health among African Americans include matters related to mental health service use. Additionally, African Americans who have previously sought treatment from a mental health professional have been less likely to return to professional mental healthcare for current needs (Alang, 2019; Broman, 2012). According to the literature, this may be due to fears of discrimination within the mental healthcare system, similar to repeated discrimination within the general healthcare system among African Americans and worry regarding the ability to navigate the mental healthcare system (e.g., Alang, 2019; Haynes et al., 2017). Furthermore, research has indicated that African Americans may have distrust in psychiatric medications due to known or perceived side effects, efficacy, and the belief that some treatments are addictive (Hankerson et al., 2011; Watkins et al., 2015).

**Awareness about mental health.** As stated previously, health literacy among the African American population has been found to be average or below average (Muvuka et al., 2020). Studies that examined mental health literacy with African Americans have reported that they are less likely to recognize mental health symptoms compared to other races/ethnicities (e.g., Alegría et al., 2012). For example, Ward et al. (2013) examined knowledge of mental illness symptoms among African American men and women. They found that the majority of participants recognized increased aggression, suicidal ideation, becoming randomly scared, undergoing panic or terror attacks, and wanting to cause harm to others as potential mental illness symptoms. Participants were less likely to recognize heart

or chest pain, nausea or upset stomach, hot or cold flashes, and sudden weakness in the body as potential mental illness symptoms. A separate study examining mental health literacy and treatment seeking attitudes indicated that African Americans were less likely to identify symptoms of generalized anxiety compared to Latino/a and White Americans. Mental health literacy was also found to be a predictor of mental health service seeking (Cheng et al., 2018).

**Social support and other beliefs about mental health services.** African Americans tend to report that social support and reinforcement from friends and family is highly valued when seeking mental health services (Hankerson & Weissman, 2012; Lukachko et al., 2015). For example, Bauer (2020) examined African American men's attitudes and beliefs toward mental health screening and found that participants reported being more comfortable with mental health screening when external support (e.g., encouragement to seek help) from their community was received. This study also found that participants reported believing there was no guarantee that professional mental health care providers would be helpful in treating a mental illness, due to the difference in race or ethnicity and life experiences among most mental health providers. Lee et al. (2021) compared mental health screening beliefs and attitudes among African Americans and found that the most significant mental health issues were alcohol and drug use. Screening for suicide was less likely to be identified as significant, possibly due to personal assumptions regarding the social severity of these conditions in their community.

### **Facilitators**

**Cultural norms (religious beliefs and behaviors).** Studies have indicated that African Americans have religious or spiritual beliefs that may heavily influence their cultural

beliefs and norms regarding mental health. African Americans are more likely to be highly religious and engage in religious coping (Ward et al., 2013) and religious activities compared to other racial/ethnic minorities (e.g., church attendance, prayer; Watkins et al., 2015; Pew Research Center, 2008). Religious or spiritual beliefs have been found to be associated with African Americans' mental health as evidenced by increased ability to cope with stress and providing a support system through the faith community (Pargament et al. 2000; Ward & Brown, 2015; Ward et al., 2013). Studies suggest that African Americans are more likely to use religious coping methods (e.g., prayer, reading holy scriptures) to address mental health concerns (Ward et al., 2013). Pargament et al. (2000) examined religious coping with African Americans and found that positive religious coping (e.g., religious purification/forgiveness and religious direction/conversion) predicted growth related to stress, positive outcomes established from stressful events, and improved cognitive functioning.

The literature states that religiosity may also serve as a protective factor against mental illness (Lukachko et al., 2015) by offering feelings of hope (Starnino, 2016), communal encouragement, and a supportive belief system (Chatters et al., 2011), especially for church-affiliated African Americans. Furthermore, several studies have also shown that African Americans often prefer to seek counseling services from religious leaders (e.g., Christensen et al., 2017), primarily due to heightened trust and familiarity with the church community or clergy and belief that God will heal them (Neely-Fairbanks et al., 2018). A qualitative study examined religious coping in African American youth (aged 11 to 17) with depression and found that these adolescents believed religious coping to be essential and could use as a strategy to encourage professional mental health treatment seeking (Breland-Noble et al., 2015). However, some studies report that religiosity may also be damaging to

mental health, due to some African Americans belief that a mental illness comes from the devil, or is a punishment from God, that should be resolved with religious acts (e.g., prayer, fasting; Weber & Pargament, 2014).

**Social norms (Discrimination).** Several studies indicate that racial discrimination may be a key contributor to variances in symptom presentation, and thereby limited service seeking and treatment of depression diagnoses among the African American population (DeFreitas et al., 2018; Dinos, 2014; Hankerson et al., 2011). This could be a result of someone experiencing discrimination and claiming the discrimination as an identity trait (Kilk et al., 2019), which has previously had a negative effect on professional mental health treatment seeking (Clement et al., 2015). Discouraging interactions with family and regular racial/ethnic discrimination have been identified as potential risk factors for professional mental health treatment seeking (Taylor & Chatters, 2020). Mental health concerns or diagnoses such as PTSD, psychosis, attempted suicide, and drug dependence have been found to be associated with discrimination and social exclusion (Dinos, 2014). Williams (2018) reported that African Americans have a significant increase in the risk of developing a mental illness or psychosis if they have experienced racially motivated verbal abuse or physical assault.

**Inequality and access to mental health services.** African Americans face numerous challenges in accessing professional mental health care, including a lack of information, high costs, distance from services, and inadequate transportation options (Kawaii-Bogue et al., 2017; Muvuka et al., 2020; Sharma et al., 2017; U.S. Census Bureau, 2019). It has been reported that many African Americans need mental health services but only one third receive it (APA, 2017). Older African Americans are less likely to seek mental health treatment and

tend to use alternative coping mechanisms (Conner et al., 2010; Kim, Lehning & Sacco, 2020). The low utilization of mental health services by African Americans is also attributed to poor-quality care, high dropout rates from treatment programs, and lack of culturally sensitive care (Ward & Brown, 2015). Being uninsured, living in poverty, and residing in low-income areas present further hurdles for African Americans seeking mental health treatment. These areas also have a shortage of mental health resources and lack the preferred mental health professionals of color (Buche et al., 2017).

Further, research has shown that African Americans tend to turn to religious leaders, such as clergy, for mental health support (Christensen et al., 2017). For instance, Lukachko et al. (2015) reported that 25% of African Americans received counseling from clergy compared to 17% who sought professional help from psychiatrists or doctors. A health needs assessment study by Berkley-Patton et al. (2018) found that nearly half of African American church members sought mental health services from their religious leaders.

### **Stigma Marking: Intersecting Stigmas**

#### **Demographics.**

*Gender.* Studies suggest that there may be gender disparities in attitudes towards mental health. For instance, a study conducted by Ward and colleagues (2013) on African American men and women's attitudes regarding mental health found that women tend to attribute mental illness to stress, trauma, drug and alcohol use, heredity, family problems, and work stress, while men only linked mental illness to stress, trauma, drug and alcohol use, and family problems but not heredity and work stress. Women believed that mental illness can be controlled despite being chronic and having negative effects, and both men and women expressed neutrality when discussing emotional impact and understanding of mental illness

concerns. Additionally, the study revealed that African American women were more likely to seek mental health services compared to men. A qualitative study of African American men found that many participants avoided seeking treatment for depression symptoms due to stigma and desired a nonjudgmental support group for discussion. Some participants even rejected the concept of depression (Hudson et al., 2016).

**Age.** Middle-aged individuals tend to rely more on professional help, informal support, and religious coping methods to treat mental health concerns compared to older adults (Ward et al, 2013). One study found that African American college students' ability to recognize mental illness was linked to higher perceived MHS (DeFreitas et al., 2018), attributing this relationship to the perceived severity of the illness causing MHS. DuPont-Reyes et al. (2019) examined MHS among non-Latino Black boys and girls in the 6th grade and found that they were more likely to desire to distance themselves from peers with mental illness compared to non-Latina White girls.

**SES.** Higher education has been found to positively impact the utilization of professional mental health services among White Americans, but not among African Americans. Conversely, lower education can pose a risk to MHS, access and utilization, due to its correlation with life expectancy, health literacy, and quality of care (Bound et al., 2015). Furthermore, lower education levels are often accompanied by lower paying jobs with fewer benefits, such as health insurance, which has been identified as a barrier to accessing professional mental health services (Hodgkinson et al., 2017).

**Sexual orientation.** African American individuals who identify as LGBTQ+ are frequently subject to multiple intersecting stigmas, including poverty, homelessness, increased violence, police brutality, and discrimination all affecting MHS (Holmes et al.,

2021). A study by Price-Feeney and colleagues (2020) revealed that 35% of African American LGBTQ+ youth between the ages of 13 and 24 have experienced homelessness, 17% physical threats, and 52% discrimination. Additionally, 55% of these youth reported symptoms of generalized anxiety disorder (GAD) and 63% reported major depressive disorder (MDD), with rates increasing to 70% and 71%, respectively, among African American transgender and nonbinary youth. Williams (2018) conducted a literature review and found that most research indicates higher prevalence of mental health problems and related issues, including MHS, among African American, minority ethnic, and LGBTQ+ communities.

*Mental health conditions and chronic disease related stigma.* Historically, culturally tailored mental health interventions often avoid using terms like "depression" because of the stigma attached to them among African Americans (Hankerson et al., 2018; Mynatt et al., 2008). One study on the perceived stigma in healthcare settings and physical/mental health among people of color found that perceived stigma was linked to higher odds of a depression diagnosis (Budhwani & De, 2019). Villines (2020) conducted a review that explored anxiety among African Americans and found that many participants held stigmatized beliefs including anxiety being a personal choice or issue, that African Americans are biologically immune to anxiety, and that African American youth do not have mental health problems. Other research has revealed a relationship between ethnic identity, MHS and anxiety in African Americans, which can lead to underreporting symptoms and avoidance of professional help seeking (Hopkins & Shook, 2017). Many culturally tailored mental health interventions purposely restrict use of terms such as depression. Researchers have reported limited use of this term because of the stigma associated with the word among African

Americans (Hankerson et al., 2018; Mynatt et al., 2008). Budhwani and De (2019) conducted a study on perceived stigma in health care settings and physical/mental health among people of color and found that perceived stigma was significantly associated with higher odds of a depression diagnosis. Villines (2020) conducted a review examining anxiety among African Americans and found that many of their participants endorsed stigmatized beliefs that anxiety is a choice or personal problem, African Americans don't experience anxiety due to biological differences across races, and African American youth do not have mental health issues. Other research has found that ethnic identity and MHS were associated with anxiety among African Americans and may result in unwillingness to report symptoms or seek professional treatment (Hopkins & Shook, 2017).

Moreover, African Americans are disproportionately affected by chronic diseases that are highly stigmatized, such as HIV/AIDS, which is strongly associated with HIV related stigma. For example, Berkley-Patton and colleagues (2010) found that African American church populations were highly knowledgeable about HIV but found that 42% of participants were afraid of people with HIV and over half were concerned about discrimination and experiencing stigma from others if found positive for HIV. Additionally, Derose et al. (2016) implemented a church-based HIV stigma reduction intervention in Latino and African American churches and found a reduction of stigma in the Latino churches but not in African American churches. As another example, African Americans, especially men, have the highest rates of lung cancer in the U.S. (CDC, 2020), primarily due to cigarette smoking. Lathan and Colleagues (2015) examined African Americans' knowledge and perspectives on lung cancer and found that their participants expressed experiencing stigma from others, which lead them to hide their lung cancer diagnoses and engage in less professional treatment

seeking. These participants also believed that lung cancer gets less attention compared to other chronic diseases in African American communities.

### **Manifestations.**

*MHS beliefs.* Past research has shown that African Americans view depression as more stigmatized in their community compared to others (Conner et al., 2010). It has been found that some African Americans view depression as a sign of weakness or a personal problem that can resolve itself (Ward et al., 2013). Neely-Fairbanks and colleagues (2018) discovered that most African Americans in their study (70%) believed that relying on their faith in God would keep them physically and mentally healthy. On the other hand, other research has shown that African Americans are comfortable with disclosing their depression and seeking mental health treatment (Anglin et al., 2008; Diala et al., 2001; Ward et al., 2013). Despite this openness, mental health stigma may still prevent African Americans from seeking help and normalizing discussions about mental health (Conner et al., 2010; Hankerson et al., 2011; Ward et al., 2013). Past research has found that many African Americans believe that depression in the African American community is more stigmatizing than in other communities (Conner et al., 2010). Some studies found that African Americans tend to believe that depression is a form of weakness – or a personal problem that can heal itself (Ward et al., 2013).

Neely-Fairbanks and colleagues (2018) also found that majority of African Americans in their study reported that their belief and reliance (70%) on God would keep them healthy both physically and mentally. Yet, other research has found African Americans are open or comfortable about disclosure regarding depression and with seeking mental health treatment (Anglin et al., 2008; Diala et al., 2001; Ward et al., 2013).

Additionally, research has found that African Americans' perceptions of MHS can lead to negative views towards treatment (DeFreitas et al., 2018). White (2019) suggested that these negative attitudes and stigmas may stem from African Americans' history of resilience and their belief that no one has the authority to label them as having an illness, particularly considering systemic racism and feelings of exploitation by the U.S. government. Fripp and Carlson (2017) conducted a study on attitudes towards MHS and found an inverse relationship between help-seeking attitudes and MHS and that attitudes towards seeking help predict the use of professional mental health services among African American and Latino/a populations.

### **Study Rationale and Hypotheses**

There is a growing body of research on the use of VR to understand mental health concerns. However, there is much to learn about how VR research can be used to address MHS with African American young adults. The goal of the present study was to expand the literature in this area regarding addressing MHS with African American young adults. This study used the Health Stigma and Discrimination Framework (Stangl et al., 2019) as a guide to plan and implement focus groups, a VR simulation, and pre-post simulation survey questions to assess MHS beliefs and to explore feasibility and acceptability of using VR to assess MHS with African American young adults. Specific domains from the framework that were examined included *drivers* (e.g., fears, awareness about mental health, social support), *facilitators* (e.g., cultural norms, social norms, equality), *stigma marking* (e.g., demographics, mental health conditions), and *manifestations* (e.g., MHS beliefs).

**Contribution to the literature.** The use of VR to address MHS among African American young adults is a large contribution to the existing literature for several reasons.

Firstly, VR provides a new and innovative approach to tackling MHS in the African American community, a population that has historically been harder to reach when addressing mental health concerns. VR has been shown to increase engagement and empathy among users in a way that traditional mental health interventions cannot (Bouchard et al., 2018). This technology has the potential to provide an immersive and interactive experience for African American young adults, which could lead to a more meaningful connection to the content and an increased understanding of the impact of MHS. Secondly, VR is particularly beneficial for young African Americans as it can be difficult to reach this population due to social and cultural barriers. VR can provide a safe and anonymous space for African American young adults to explore their thoughts and feelings regarding mental health without fear of stigma or discrimination (Rizzo et al., 2020). This is particularly important given the persistent stigma associated with mental health in the African American community. Additionally, VR technology is more accessible to young adults, who are more likely to engage with digital media and technology, compared to older adults.

Finally, the use of VR in mental health interventions for African American young adults provides valuable data for researchers and practitioners. The virtual environments employed can be designed to collect data on attitudes and behavior, which can be used to inform future interventions and better understand the specific challenges faced by African American young adults regarding MHS. Overall, the use of virtual reality in addressing MHS among African American young adults is a significant contribution to the field, providing a new and effective tool to tackle an important issue.

This study, according to our research, is one of the first to address mental health stigma using VR technology. More specifically, it is the first study to use VR technology to

address mental health stigma with the African American young adult population. This study has also considered the importance of culturally tailored interventions for the African American population and implemented culturally competent components in its design. Given the exploratory nature of this study, specific hypotheses were not generated. Instead, the focus group discussions informed the outcomes of interest guided by the Health Stigma and Discrimination Framework. Additionally, brief surveys were used to assess possible correlations between the framework's domains and the VR simulation.

## CHAPTER 2

### METHOD

#### **Approach**

The purpose of this study was to examine the feasibility and acceptability of using VR to address MHS among African American young adults. This study also explored MHS beliefs and behaviors, and strategies, including VR, to address MHS among this population. This study included six focus groups, which were conducted with between six to 13 participants in each group. Focus group questions elicited responses about MHS beliefs, behaviors, experiences, and participant ideas on designing and implementing MHS interventions for African American young adults. A baseline survey was administered with questions on each domain of the Health Stigma and Discrimination Framework (i.e., drivers, facilitators, stigma marking, manifestations). Also, a VR simulation displaying GAD symptoms after facing MHS from friends and family was experienced by participants in each focus group, immediately followed by a post simulation survey and follow up focus group questions on their VR experience. These focus group activities with African American young adults were guided by the Health Stigma and Discrimination framework.

#### **Participants**

This study recruited African American young adults (N = 51). Eligibility criteria included: (1) self-identifying as African American/Black, (2) aged 18 to 35, (3) agreement to participate in one in-person focus group, the VR simulation, and two surveys. Participants were recruited from community-based organizations (i.e., churches, universities) located in the urban Kansas City area, and through social media (Facebook, Instagram). Additionally,

participants were given the option to gather a group of 8-10 people for a private focus group with peers. Participants were also informed of this study through flyers posted in university classrooms and distributed at other research events, word-of-mouth and individuals sharing the flyer posted to social media platforms, and announcements at community advisory boards. Individuals interested in participating were able to contact the principal investigator (PI) who provided additional study information (e.g., eligibility, dates/times of focus groups) and answered participants' questions. The PI obtained verbal informed consent, scheduled focus groups with participants, and collected contact information in order to remind participants of their upcoming focus group. Participants were compensated \$30 and were provided with a meal valued at \$10 per person for their time (1.5 – 2 hours) in participating in the focus group study activities. All study procedures were reviewed and approved by the University of Missouri – Kansas City Institutional Review Board.

### **VR Simulation**

As guided by the Health Stigma and Discrimination Framework, the VR simulation focused on displaying manifestations (stigma/stigmatized experiences) of experiencing MHS. A story was created to describe an African American young adult experiencing MHS beliefs and attitudes from their friends and family. This story was created to be culturally relevant to the African American young adult population. The participant embodied a character dealing with a stressful situation (i.e., explaining an anxiety diagnosis to friends and family) and was instructed to complete an everyday task (i.e., pick out an outfit to go to work the next day). The stigmatizing behavior or discriminatory attitudes were displayed as causing intrusive thoughts about negative experiences after the character explains the diagnosis to friends and family. The mental illness symptoms included difficulty concentrating, fatigue, and feeling

on edge (see Appendix B for the complete story). Table 2 below explains how each construct of the story represents a domain of the Health Stigma and Discrimination Framework. The VR simulation was given to participants through an Oculus Quest headset in a controlled environment provided by the UMKC’s VR showroom located in the Plaster Center at the School of Computing and Engineering and took approximately 10 minutes to complete. Each participant engaged in the simulation independently (e.g., not engaging with or seeing each other within the simulation). The VR simulation was viewed by a 2<sup>nd</sup> person from UMKC School of Computing and Engineering with expertise in development and use of VR for flow.

**Table 2**

*Adapted Framework Domains and VR Simulation Constructs of Mental Health-Related Stigmatization among African American Young Adults*

	<b>Theory Domains</b>	<b>VR Simulation</b>
<b>Drivers</b>	<ul style="list-style-type: none"> <li>• Fears (Mental health issues)</li> <li>• Awareness (Mental health)</li> <li>• Social support (Mental health services)</li> </ul>	<ul style="list-style-type: none"> <li>• The character, although scared about what they might think, went to talk to friends/family members about the diagnosis for support and received unsupportive comments.</li> <li>• A friend/family member said, “Black people don’t have anxiety”.</li> </ul>
<b>Facilitators</b>	<ul style="list-style-type: none"> <li>• Cultural norms (Religious beliefs and behaviors)</li> <li>• Social norms (Discrimination)</li> </ul>	<ul style="list-style-type: none"> <li>• The character went to a cookout to be with family and friends.</li> <li>• A friend/family member said, “you just need to pray”.</li> <li>• Another said, “I bet the doctor was White”.</li> </ul>

**Stigma Marking:  
Intersecting Stigmas**

- Mental health conditions

- In the simulation, there was a prayer and meditation “coping button”.
- The character was diagnosed with GAD and experienced GAD symptoms in the simulation (e.g., difficulty concentrating, fatigue, feeling on edge).
- A friend/family member said, “I can’t be around crazy people”.
- Another said, “why do you trust these doctors”.

**Manifestations  
(Stigmatizing Practices)**

- Mental health-related stigma beliefs (Stereotypes and prejudices)

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GAD=Generalized Anxiety Disorder

**Focus Groups**

Six focus groups were held with six to 13 participants per group, for a total of 50 participants. The PI took notes on observations during the focus groups and participants’ comments were audio recorded and transcribed for coding purposes. Participants also completed two brief surveys. The order of the focus groups was as follows: The participants were given the first survey then there was an introduction of the PI and welcome to the participants. The participants were provided a brief overview of MHS among African American young adults. Participants were then asked focus group questions regarding their mental health experience based on the Health Stigma and Discrimination Frameworks domains, knowledge of MHS and prior VR usage. Directly following the discussion, the participants engaged in the VR simulation. Up to five participants engaged in the simulation at a time while the others partook in the meal provided. Participants engaged in the VR simulation while being seated in the front of the room. Participants were instructed to stay seated during the simulation and the PI and up to two members of the research team

monitored the participants to provide warning of moving too close to people or objects and additional help with simulation instructions. Following the VR simulation, the participants were given the post survey addressing additional constructs including their experience with the VR simulation. Finally, the focus group concluded with discussion questions regarding the VR simulation. Participants were asked about their perspectives on the use of VR and other intervention strategies to address MHS with African American young adults (see Appendix B for flow diagram of focus groups).

A focus group discussion guide (see Appendix A) was used to ensure consistency of information relayed (e.g., background on MHS) and semi-structured questions asked of participants in each focus group. The PI led the focus group discussions and administering of surveys. Two undergraduate research assistants assisted the PI with these activities.

### **Brief Survey Measures**

Participants completed two brief surveys that assessed demographic information, mental health screening history, perceived discrimination, medical mistrust, facilitators and barriers to mental health service seeking, and MHS attitudes/beliefs to supplement qualitative data obtained from focus groups. Additionally, the post-survey included questions about the VR simulation experience such as sense of embodiment, story transportation, and their perception of the most helpful coping button (i.e., breathe, meditate, pray, fresh air). Furthermore, the survey captured participant data that may not be shared in focus groups due to time limitations and/or participants reluctance to share in a group setting. The surveys took approximately 20 to 30 minutes to complete.

## Drivers

**Fears about mental health.** Fears were assessed with the Medical Mistrust Index (LaVeist, 2009). This measure consisted of seven questions that assessed participant reported trust in the healthcare system and has been validated with diverse populations (Williamson & Bigman, 2018; Cronbach's  $\alpha = .76$ ). An example included “*you’d better be cautious when dealing with health care organizations*” with responses ranging from 1 = strongly disagree to 4 = strongly agree. Summed scores ranged from 7 to 28 and higher scores indicated higher levels of medical mistrust.

**Awareness about mental health.** Mental health awareness was assessed with two questions. These questions included, “*In your opinion, how serious is mental health in your community*” (0 = not at all serious to 3 = very serious) and “*In the last 12 months, how many people did you talk to about any topics related to mental health*” (0 = none to 5 = 20 or more people).

**Social support regarding mental health.** Social support regarding mental health was assessed with 11 questions. These questions assessed the extent of belief in statements such as “*If I found out I had a mental health condition, I could get connected to resources (e.g., counseling) or receive medications for treatment*” (0 = not at all to 6 = very likely) and “*My friends would support me in getting a mental health screening*” (0 = not at all to 6 = very much so). Summed scores ranged from 0 to 66, and higher scores indicated more positive social support.

## Facilitators

**Cultural norms.** Cultural norms were assessed using measures on religiosity. Six questions inquired about engagement in various religious activities (e.g., *thoughts of God*,

*prayer, meditation, attended a worship service, read scriptures/holy writings, had direct experiences with God*) in the past 12 months and response categories ranged from 0 = never to 7 = more than once a day. Summed scores ranged from 0 to 42, and higher scores indicated engagement in religious behaviors/coping. Religious/spiritual coping was assessed using the RCOPE (Pargament, 1999). The RCOPE is a comprehensive measure that assesses both positive and negative methods of religious/spiritual coping. Nine RCOPE questions examined Collaborative Religious Coping (e.g., *I try to make sense of the situation with God*), Self-directing Religious Coping (e.g., *I try to deal with my feelings without God's help*), and Passive Religious Deferral coping (e.g., *I don't try to cope; only expect God to take my worries away*) with response categories ranging from 0 = not at all to 3 = a great deal. Internal consistency for each scale is: collaborative religious coping (Cronbach's  $\alpha = .84$ ), self-directive religious coping (Cronbach's  $\alpha = .74$ ), and passive religious coping (Cronbach's  $\alpha = .79$ ). Summed scores ranged from 0 to 9 for each scale, and higher scores indicated higher engagement in religious behaviors/coping.

**Social norms.** Three questions were asked regarding discrimination and harassment. These questions included, “*have you experienced discrimination because of your race or skin color during a healthcare visit in the past year*”, “*have you experienced harassment because of your race or skin color at work in the past year?*” and “*have you experienced discrimination because of your race or skin color in social or community settings in the past year*” (1 = yes, 0 = no; Henning-Smith et al. 2013). Summed scores ranged from 0 to 3, and higher scores indicated more experiences of discrimination and/or harassment.

**Access to services.** The Perceived Stigma and Barriers to Care for Psychological Problems scale were used to assess access to mental health services inclusive of a Barriers to

Care subscale (Chronbach's  $a = .82$ ; Britt et al., 2008). This measure consisted of five questions such as *"I don't know where to get help"* and *"getting treatment costs too much money"* (1 = strongly disagree to 5 = strongly agree). Two additional questions were added to assess for culturally specific barriers to accessing mental health services such as, *"I can't find an African American mental health professional"* and *"I don't believe that the mental health professional would understand my concerns"* (1 = strongly disagree to 5 = strongly agree). Summed scores ranged from 7 to 35 and higher scores indicated less access to services.

### **Stigma Marking/Intersecting Stigmas:**

**Demographic information.** Demographic information collected included age, gender at birth, race/ethnicity, sexual orientation, average monthly income, education and insurance coverage.

**Mental health conditions.** Mental health issues or mental illnesses (e.g., depression, anxiety and other stress related factors) were assessed. Symptoms of depression were assessed using the Patient Health Questionnaire (PHQ)-9 (Chronbach's  $a = .81$ ; Kroenke, Spitzer, Williams, 2001). This scale consisted of nine questions about symptoms of depression (e.g., little interest or pleasure in doing things, feeling tired or having little energy) and responses ranged from 0 = not at all to 3 = nearly every day, and one question (e.g., *if you checked off any problems, how difficult have these made it for you to do your work, take care of things at home, or get along with other people?*), ranging from 0 = not at all difficult to 3 = extremely difficult. Summed scores ranged from 0 to 30, and higher scores indicated more severe depression.

Symptoms of anxiety were assessed using the Generalized Anxiety Disorder (GAD) - 7 (Chronbach's  $a = .89$ ; Spitzer, Kroenke, Williams, & Lowe, 2006). This scale consisted of seven questions about generalized anxiety (0 = not at all sure to 3 = nearly every day; e.g., feeling nervous, anxious or on edge, trouble relaxing), and one question about functional impact: "*if you checked off any problems, how difficult have these made it for you to do your work, take care of things at home, or get along with other people?*" ranged from 0 = not difficult at all to 3 = extremely difficult. Summed scores ranged from 0 to 24, and higher scores indicated increased anxiety.

Participant stress was assessed using the Perceived Stress Scale (Chronbach's  $a = .82$ ; Cohen, Kamarck, and Mermelstein, 1983). This measure consisted of 10 questions (0 = never to 4 = very often, e.g., *In the last week, how often have you been upset because of something that happened unexpectedly?*). Four additional questions were included in this scale (e.g., *In the last week have you... dealt successfully with irritating life hassles; felt that you were effectively coping with important changes that were occurring in your life*; 0 = never to 4 = very often). The six positively stated items were reverse scored (e.g., 0 = 4, 1 = 3, 2 = 2, 3 = 1 and 4 = 0) and then summed across all scale items to obtain total scores. Summed scores ranged from 0 to 56, and higher scores indicated increased levels of stress and greater vulnerability to stressful life events.

## **Manifestations**

**MHS beliefs.** MHS was assessed using the scale created by 19 Mental Illness Stigma Panel members (MISPM) consisting of individuals from SAMHSA and the Division of Adult and Community Health, CDC members, and other academic and consumer partners, and examines attitudes towards people with mental illness (Kobau et al., 2009). This measure

consisted of 10 questions regarding attitudes about mental health (e.g., *I believe a person with mental illness is a danger to others; I believe a person with mental illness can eventually recover*; 1 = strongly disagree to 5 = strongly agree). Two additional questions were included in this scale. These questions asked participants their level of agreement with the following statements “*people with mental health conditions are responsible for having their illness*” and “*scientists and doctors can be trusted to tell the truth about mental health conditions*”; 1 = strongly disagree to 5 = strongly agree). The eight positively stated items were reverse scored (e.g., 1 = 5, 2 = 4, 3 = 3, 4 = 2 & 5 = 1), then summed across all scale items to obtain scores. Summed scores ranged from 1 to 60, with higher scores indicated increased MHS.

#### **VR Measures:**

**Sense of embodiment.** This measure assessed the extent to which the participant felt that they were the character they saw in the simulation. Sense of embodiment has been measured in other studies examining VR constructs and were specific to the context of each study. This study assessed sense of embodiment with four questions modified from the Yuen and Mack (2021) study such as: “*rate how you felt during the simulation... I felt as if I was looking at my own body; I felt like I could control the simulated body; I felt like an outsider to the story*” (1 = strongly agree to 5 = strongly disagree). Two additional questions specified for the simulation in this study were included such as “*while moving the clothes in the experience, I felt it was me picking out an outfit*” and “*when the heart rate meter appeared, I felt it was displaying my heart rate*” (1 = strongly agree to 5 = strongly disagree). Summed scores ranged from 6 to 30. The two positively stated questions were reverse scored (e.g., 1 = 5, 2 = 4, 3 = 3, 4 = 2 & 5 = 1), and higher scores indicated better sense of embodiment.

**Story transportation.** This measure assessed how well the story in the simulation was understood by the participant. This was assessed with five questions adapted from the Transportation Scale-Short Form (Chronbach's  $\alpha$  range from .77-.89; Appel et al., 2015). These questions included: "*While I was reading the narrative, I could easily picture the events in it taking place*"; "*I could picture myself in the scene of the events described in the narrative*"; "*I was mentally involved in the narrative while reading it*"; "*The narrative affected me emotionally*" (1 = not at all to 7 = very much). Summed scores ranged from 1 to 35, and higher scores indicated better story transportation.

**Use of the simulation tools.** Participants' use of "helping hands", buttons within the simulation used to calm themselves down during the different anxiety symptoms, were measured by asking "*During the Virtual Reality experience, which helping hand did you think was the most helpful in lowering your heart rate?*". Response items included *breathe, meditate, pray, fresh air or none.*

**Prior use of VR.** Participants were asked about their prior experiences with VR with the questions, "*Have you ever used VR before?*" (1 = yes, 0 = no) and "*How often have you used VR before today?*" (1 = I haven't used VR before to 5 = 5 or more times).

## **Data Analysis**

Focus group discussions were transcribed and analyzed using NVivo, a software program that assists with qualitative data analysis. TranscribeMe, a service of NVivo, transcribed each focus group verbatim to assist with analysis of the qualitative data. Audio recordings were securely stored in locked cabinets in a locked storage room. Recordings sent to NVivo did not include any identifying information. A privacy agreement was secured from NVivo to ensure participant data was protected. A codebook was used to capture thematic

elements of participants' comments in alignment with the Health Stigma and Discrimination Framework domains. The coding process was implemented using the following protocol. First, the PI conducted "open coding" by identifying key themes, phrases, and behaviors from transcriptions. Next, a second coder reviewed the coding conducted by the PI by clarifying categories, identifying repetitive factors, and recommending additional themes to include. The PI and the second coder reconciled their evaluations and focused on the framework's domains.

Following reconciliation between the PI and the second coder, a coding schema was developed, and all focus groups were coded using this schema to best understand thematic elements (e.g., positive or negative MHS beliefs). The PI and second coder reviewed all transcriptions using this coding schema. Inter-rater reliability of 80% for coding of *all* focus groups (e.g., 80% agreement between PI and second coder) is typically recommended in qualitative research (Miles et al., 1994). The PI and second coder reviewed the focus group transcriptions with low reliability (e.g., <80%) and discussed and resolved areas of disagreement.

Focus group results were reported regarding a) the Health Stigma and Discrimination Framework domains (e.g., drivers, facilitators, stigma marking, manifestations), b) past experiences with VR, and c) potential intervention strategies and implications for culturally tailored MHS interventions including use of VR simulations.

The brief surveys supplemented the focus group discussion findings by providing additional and possibly more in-depth information that may not be addressed in discussions. Demographics (e.g., age, gender), each of the domains (e.g., drivers, facilitators, stigma marking, manifestations), and VR usage and experience were addressed in the baseline and

post-surveys. Frequencies and means were used to describe participant characteristics and MHS beliefs and behaviors from the survey data. Correlations were conducted to determine relationships between each domain and the VR simulation. *T*-tests were conducted to determine significant differences between means of continuous variables across the baseline and post-surveys.

## CHAPTER 3

### RESULTS

#### Demographics

Six focus groups were held with between six and 13 participants per focus group. Many participants ( $N = 51$ ; Mean age = 27,  $SD = 5.1$ , Range = 18-35) were heterosexual (82.4%) and female (62.7%). Most participants reported they had a college or graduate degree, had taken graduate courses (39.2%) or had some college or an associate degree/technical school certificate (39.2%). Most also had some type of health insurance (84.3%). Regarding their self-reported mental health status, participants endorsed low levels of depression (PHQ-9;  $M = 7.2$ ;  $SD = 7.1$ ; Range = 0-30) and anxiety (GAD-7;  $M = 7.2$ ;  $SD = 5.9$ ; Range = 0-24), and moderate levels of perceived stress ( $M = 29.9$ ;  $SD = 8.4$ ; Range = 0-56). Baseline survey data indicated that participants had moderate to high levels of MHS ( $M = 38.4$ ;  $SD = 5.8$ ; Range 1-60). Most participants endorsed visiting a mental health professional at least once in their lifetime (68.6%). Most participants endorsed experiencing VR at least once prior to the focus group (54.9%). More participant characteristics are provided in Table 3.

**Table 3**

*Participants Characteristics (Frequencies, Means and Standard Deviations;  $N = 51$ ).*

Participant Characteristic	% (n)
<b>Race</b>	
African American	94.1 (48)
Other	5.9 (3)
<b>Gender</b>	
Male	35.3 (18)
Female	62.7 (32)

Participant Characteristic	% (n)
<b>Sexual orientation</b>	
Heterosexual	82.4 (42)
Not heterosexual	17.6 (9)
<b>Education</b>	
Low (High school graduate or GED - some college)	47 (24)
High (Associates degree – graduate degree)	52.9 (27)
<b>Monthly Income</b>	
0- 2500	27.5 (14)
2501+	52.9 (27)
<b>Health Insurance</b>	
Yes	84.3 (43)
No	15.7 (8)
<b>Marital Status</b>	
Married	15.7 (8)
Not married	84.3 (43)
<b>Mental health is a serious issue (awareness)</b>	
Yes (somewhat- very serious)	86.2 (44)
No (not at all- not too serious)	13.8 (7)
<b>Talk about mental health topics (awareness)</b>	
Yes (one person in the past 12 months)	92.2 (47)
No	7.8 (4)
<b>Visited a mental health professional</b>	
Yes	68.6 (35)
No	27.5 (14)
<b>Ever experienced VR</b>	
Yes	54.9 (28)
No	45.1 (23)

<sup>a</sup> Percentages may total less than 100 because of rounding or missing responses.

### **Descriptive Statistics**

Detailed characteristics regarding the Health Stigma and Discrimination Framework domains are provided in Table 4. Notably, the baseline survey results indicated moderate to

low levels of fear ( $M = 20.2$ ;  $SD = 3.3$ ; Range 1-60) and moderate levels of awareness ( $M = 2.4$ ;  $SD = .77$ ; Range 0-3). Participants endorsed moderate levels of cultural norms ( $M = 25.4$ ;  $SD = 10.6$ ; Range = 0-42) and moderate to high levels of collaborative religious coping ( $M = 6.2$ ;  $SD = 2.8$ ; Range = 0-9). Additionally, they reported low levels of self-directive religious coping ( $M = 2.9$ ;  $SD = 2.6$ ; Range = 0-9) and passive religious coping ( $M = 1.9$ ;  $SD = 1.9$ ; Range = 0-9). Results indicated moderate levels of social norms ( $M = 1.4$ ;  $SD = 1.1$ ; Range 0-3), high levels of social support ( $M = 44.5$ ;  $SD = 13.3$ ; Range = 0-66), and low to moderate levels of access to mental health services ( $M = 14.7$ ;  $SD = 5.2$ ; Range = 7-35).

Post-survey data indicated that, by the conclusion of the focus groups, participants endorsed significantly decreased levels of fear ( $M = 19.2$ ;  $SD = 4.1$ ;  $p = .01$ ), significantly increased levels of access to mental health services ( $M = 17.2$ ;  $SD = 5.6$ ;  $p < .001$ ) and slightly decreased endorsement of awareness about mental health ( $M = 2.3$ ;  $SD = .88$ ;  $p = .24$ ). Participants maintained around the same level of social support ( $M = 43.3$ ;  $SD = 15$ ;  $p = .27$ ) and slightly decreased MHS ( $M = 36.8$ ;  $SD = 7.3$ ;  $p = .01$ ). Regarding engagement in the VR simulation, post-survey data indicated that participants had moderate to high levels of sense of embodiment ( $M = 19.8$ ;  $SD = 4$ ; Range = 6-30) and high levels of story transportation ( $M = 25.7$ ;  $SD = 5.3$ ; Range = 1-35). Majority of participants endorsed liking to see a mental health professional if needed (72.5%), being ready to see a mental health professional (72.6%), intent to encourage others to seek professional care (86.3%) and committed to change the way they treat others with mental health concerns (88.2%). Lastly, majority of participants endorsed believing VR should be used to address mental health stigma and other topics (82.3%).

**Table 4***Health Stigma and Discrimination Framework Domains (baseline and post-survey data).*

Variable	Baseline			Posttest			p
	M	SD	Range	M	SD	Range	
Fears	20.2	3.3	1-60	19.2	4.1	1-60	.01*
Awareness	2.4	.77	0-3	2.3	.88	0-3	.24
Social Support	44.5	13.3	0-66	43.3	15	0-66	.27
Cultural Norms							
Religious Activities	25.4	10.6	0-42	-	-	-	-
Self-directive Religious	2.9	2.6	0-9	-	-	-	-
Coping							
Collaborative Religious	6.2	2.8	0-9	-	-	-	-
Coping							
Passive Religious Coping	1.9	1.9	0-9	-	-	-	-
Social Norms	1.4	1.1	0-3	-	-	-	-
Access to Services	14.7	5.2	7-35	17.2	5.6	7-35	<.001***
Mental Health Concerns							
Depression	7.2	7.1	0-30	-	-	-	-
Anxiety	7.2	5.9	0-24	-	-	-	-
Perceived Stress	29.9	8.4	0-56	-	-	-	-
Mental Health Stigma	38.4	5.8	1-60	36.8	7.3	1-60	.01*

\* $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$ **Correlational Analysis**

Correlational analyses were conducted to determine relationships between the framework's domains and the VR simulation measures sense of embodiment and story transportation. As presented in Table 5, results indicated no significant correlation between most demographic variables that were included in the stigma marking/intersecting stigmas domain. Results indicated a significant correlation between story transportation and age ( $r = -.32$ ;  $p = .02$ ) along with ever visiting a mental health professional ( $r = .29$ ;  $p = .04$ ). Story transportation was also significantly correlated with sense of embodiment.

**Table 5***Correlational Analysis of the Participant Demographics and VR Simulation Measures*

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10
1. Sense of Embodiment	51	19.8	4	—									
2. Story Transportation	51	25.7	5.3	.5**	—								
3. Age	51	27.5	5.1	-.18	-.32*	—							
4. Gender	51	9.8	58.6	-.1	.17	-.24	—						
5. Race	51	1.3	1.1	-.13	-.15	-.12	-.04	—					
6. Sexual Orientation	51	1.4	.92	.08	.25	-.25	-.41**	.34*	—				
7. Education	51	6.1	2.1	.05	.01	.23	-.21	.00	-.1	—			
8. Insurance	51	.16	.37	-.13	-.1	-.32*	-.1	-.11	-.1	-.04	—		
9. Income	51	103.1	202.9	-.1	-.00	-.3*	.29*	.1	.22	.3*	-.1	—	
10. Visited a Mental Health Professional	51	.55	.5	-.1	.29*	-.3*	.13	-.1	.04	-.11	-.04	.15	—

\**p* < .05 \*\* *p* < .01 \*\*\* *p* < .001

Table 6 presents correlational results of the framework domains included in the baseline survey and the VR measures. Significant correlations were found between fear and sense of embodiment ( $r = .34; p = .02$ ) and story transportation ( $r = .43; p = .002$ ); awareness and sense of embodiment ( $r = .37; p = .01$ ); social support and story transportation ( $r = .41; p = .02$ ); social norms and sense of embodiment ( $r = .43; p = .002$ ) and story transportation ( $r = .38; p = .01$ ). Additionally, there were significant correlations between depression and story transportation ( $r = .31; p = .04$ ); anxiety and story transportation ( $r = .33; p = .02$ ); and perceived stress and sense of embodiment ( $r = .44; p = .001$ ) and story transportation ( $r = .55; p < .001$ ). Lastly, there was a significant correlation between MHS and sense of embodiment ( $r = .51; p < .001$ ) and story transportation ( $r = .37; p = .01$ ). Table 7 presents correlational results of the framework domains included in the post-survey and VR measures. Significant correlations were found between fears and story transportation ( $r = .6; p < .001$ ); awareness and sense of embodiment ( $r = .43; p = .002$ ) and story transportation ( $r = .51; p < .001$ ); social support and story transportation ( $r = .38; p = .02$ ); and MHS and sense of embodiment ( $r = .59; p < .001$ ) and story transportation ( $r = .5; p < .001$ ).

**Table 6***Correlational Analysis of the Health Stigma and Discrimination Framework's Domains and VR Simulation Measures (Baseline)*

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Sense of Embodiment	51	19.8	4	—														
2. Story Transportation	51	25.7	5.3	.51**	—													
3. Fears	51	20.2	3.3	.34*	.43**	—												
4. Awareness	51	2.4	.77	.37**	.16	.09	—											
5. Social Support	51	44	13.3	.33	.41*	.48**	.48**	—										
6. Religious Activities	51	25.4	10.6	.08	-.04	.3*	.29*	.47**	—									
1. Collaborative religious coping	51	6.2	2.8	.23	.03	.24	.21	.36*	.75**	—								
2. Self-Directive Religious Coping	51	2.9	2.7	.1	.16	.09	-.03	-.41*	.53**	-.61	—							
3. Passive Religious Coping	51	2	2	-.18	-.03	.16	-.11	.27	.36**	.33*	-.45*	—						
4. Social Norms	51	1.4	1.1	.43**	.38**	.2	.21	.00	.08	.03	.09	-.06	—					

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5. Access to Services	51	14.7	5.2	.08	.17	-.1	.06	-.14	-.35*	-.32*	.31*	-.21	.04	—				
6. Depression	51	7.2	7.1	.04	.31*	.13	.16	-.35	.44**	-.52**	.44**	-.3	.21	.47**	—			
7. Anxiety	51	7.3	6	.22	.33*	.14	.06	-.46**	-.5**	-.53**	.71**	-.37*	.16	.53**	.85**	—		
8. Perceived Stress	51	29.9	8.4	.44**	.55**	.26	.51**	.41*	.07	.1	.24	-.2	.14	.07	.3	.27	—	
9. MHS	51	38.4	5.8	.51**	.37**	.11	.26	.46**	.18	.22	-.04	-.04	.01	-.09	-.25	-.08	.33*	—

\* $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$

**Table 7**

*Correlational Analysis of the Health Stigma and Discrimination Framework's Domains and VR Simulation Measures (post)*

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
1. Sense of Embodiment	51	19.8	4	—						
2. Story Transportation	51	25.7	5.3	.51**	—					
3. Fears	51	19.2	4.1	.18	.6**	—				
4. Awareness	51	2.3	.88	.43**	.51**	.42**	—			
5. Social Support	51	43.3	15	.31	.38*	.53**	.66**	—		
6. Access to Services	51	17.2	5.6	.04	.25	.24	-.06	-.21	—	
7. MHS	51	36.8	7.3	.59**	.5**	.36*	.55**	.73**	-.04	—

\* $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$

### **Focus Group Findings**

Percentage agreement following secondary coding (e.g., discussion and reconciliation between coders) was 97%. Cohen's kappa indicated sufficient agreement between coders ( $k = .97, p < .001$ ). Key themes discussed in focus groups derived directly from the Health Stigma and Discrimination Framework domains. These themes and related participant quotes are shown in Table 8 and are summarized below.

### **Drivers**

As described earlier in the text, drivers are defined by the Health Stigma and Discrimination Framework as negative thoughts and behaviors related to mental health. Primary themes that emerged from the focus group discussions regarding driver constructs

included fears (i.e., being judged and/or labeled, being treated differently and having to take medication if being treated for a mental illness), awareness about mental health (i.e., how and when to seek treatment), and social support (i.e., family, the church, older generations).

**Fear.** Overall, participants commented on four types of fears including being judged, acquiring labels, being treated differently and having to take medication if being treated for a mental illness. Regarding judgement, many of the participants reported that they would be judged by parents, family, or friends for disclosing symptoms and diagnoses (e.g., negative thoughts, anxiety disorder). For example, one participant stated, “I told my mom some pretty serious thoughts I was having, and she lashed out and, you know, told me I need to get it together”. When discussing acquiring labels, participants reflected on how having a mental illness diagnosis may become an identifying factor of one’s character. Specifically, one participant said, “Putting labels on stuff makes it real, like, OK. I was sad yesterday, but today the doctor said, I have depression. That’s a totally different thing. So maybe straying away from the therapy is straying away from the diagnosis, which is straying away from the accountability of the diagnosis”.

Many participants made comments regarding a fear of being treated differently across multiple settings such as work, school, and at home if open about mental health concerns with their peers. Specifically, a participant explained a scenario they witnessed and said, “One of the new girls on our team (...) had anxiety or something and she spoke openly about it (...) But I also saw how that kind of messed things up in the team dynamic (...)”. Lastly, participants commented on the fear of being forced to take medication for mental illnesses and the length of time required to take medication. One participant noted, “They also force

mental illness on the Black clients like they're so quick to. They sign you up for behavior health. 'Let's get you on medication'".

**Awareness.** Participants discussed African American's level of awareness regarding aspects of mental health such as where to seek professional treatment and how open they are to discussing aspects of mental health. A small portion of participants believed that African Americans are aware of where to get help and are typically open to discussing mental health topics with others. Specifically, some participants made statements such as, "I would say as much as any other race" and "That's all any podcast, any news feeds talk about. I feel like It's everywhere now". However, most participants commented that African Americans were unaware compared to others about mental health topics regarding how or when to seek professional treatment. For example, participants made the following comments, "We don't, we know we have them [mental health concerns], but we don't know what to do with them" and "Black people, we don't. We just don't know. And when you don't know, where there's no vision, the people perish".

**Social support.** Themes regarding social support emerged and related to family and the church as being supportive in encouraging them to seek mental health treatment or being willing to listen to their mental health concerns. For example, participants stated, "I feel like both my family and friends, I'm blessed to say that they will both be super supportive" and "Now that pastors are getting younger and younger and they're more in our generation, they support more of their own generation to go seek the help". However, family and church were also perceived to be limited in addressing mental health concerns. Their comments suggested family and the church would discourage use of professional treatment, only encourage culturally traditional, unprofessional ways of coping, or would respond negatively when

symptoms were disclosed. Participants said, “I’d say, immediate family in general. (...) It’s just like kind of like they’re supportive, but then there’s like sarcastic comments” and “Then there are the others that just say, like, you know, ‘I’m saying tarry before the Lord, and ask the Holy Spirit to help you’”. Participants commented that the older members of their family and church are unsupportive due to lack of knowledge, stigmatizing beliefs, or unwillingness to discuss mental health concerns. Specifically, participants stated, “The older generation stigmatize our generation for mental illness” and “Like if I went to my granny right now, and said anything about mental health, she would be so confused. (...) She would say, ‘we didn’t know anything about that growing up. We did what we had to do and that’s it’”.

### **Facilitators**

Facilitators were defined as positive and negative external influences on MHS. Themes that emerged regarding facilitator domains, cultural and social norms and access to services, included typical responses to mental health topics (i.e., teasing, spiritual or religious solutions, being a “strong Black man/woman”, or dismissiveness) and common barriers to accessing services (i.e., cost, availability of providers, knowledge about services and/or symptoms, comfortability with treatment or providers, and a lack of same race mental health providers).

**Cultural and social norms.** When discussing cultural and social norms, most participants reported that African Americans tend to be culturally oriented in their response to mental health concerns and described some of these responses as teasing. For example, many participants stated that if they were to discuss mental health concerns with family and friends, they would be teased due to them not considering mental health as a serious issue or wanting to minimize the situation. Specifically, one participant stated, “I do see that going

on, it's more of a joke for people than anything else, and they think it's funny". Participants also commented that family and friends would suggest spiritual or religious solutions, opposed to professional treatment, to address mental health concerns due to mistrust in mental health providers and a preference for religious coping. For example, a participant explained that they were told by a peer that they did not have a mental health diagnosis: "That's just something that they that they told you. It's OK. We just gone go to church. We gone, pray about it and you're going to be OK".

Participants suggested that African Americans respond to mental health concerns with a "strong Black man/woman" complex. Participants indicated that African Americans are expected to have more resilience compared to others due to daily hardships African Americans face in society. For example, one participant said, "The stigma of being masculine in talking about going to therapy or whatever (...). People who ain't there yet, they're going to be like, oh, are you really going to go do that". Another participant stated, "I think Black women are told to be strong no matter what". Lastly, participants suggested that African Americans may be dismissive if mental illness is discussed due to disbelief that there is a serious concern or that they may not want or know how to get involved. A participant reported, "I feel like with the Black community, they kind of just shrug us off".

**Access to services.** Most participants stated several barriers to accessing mental health services including cost, availability of providers, and knowledge about services and/or symptoms. Regarding the cost, participants stated that professional mental health services were often too expensive for many, and the costliness of services could contribute to increased severity of mental illness symptoms. For example, one participant stated, "There are some free therapy online for Black men. It's all the way booked up. And so, whenever I

was going through therapy, at first it was \$70 a pop (...) I got to work extra. That's going to affect my mental health to be able to afford a therapist". Participants stated that professional mental health services were not easily accessible due to the lack of mental health facilities in low-income areas, or the length of time projected to be seen by a provider. A participant specifically stated, "It's not accessible in like certain lower socio-economic communities. They don't have access to it. They are booked for years". Additionally, participants commented on how African Americans often are not knowledgeable about what services are available or what mental health symptoms may require professional treatment. One participant reported, "(...) if people are unaware, how would they know somebody is bipolar, schizophrenic, are dealing with depression or anxiety, if they don't know what the signs of looking for".

Participants discussed how medical mistrust is another major barrier to accessing mental health services. They reflected on the Tuskegee experiment conducted in the 1930s deferring African Americans from trusting medical professionals. Specifically, one participant commented, "(...) the Tuskegee experiment, right? (...) So, I think people are still worried about, you know, ingesting stuff in their body because of that". Another participant expressed mistrust in pharmaceutical companies regarding medication that is prescribed for mental illnesses, "It helps the pharmaceutical companies be able to capitalize on that". Lastly, participants stated that not having access to African American mental health providers is a barrier and indicated that most did not trust or want to discuss personal matters with mental health providers that are of different races due to potentially being misunderstood: "They have to look like us or we not going to pay attention to it because I definitely would not".

## **Stigma Marking/Intersecting Stigmas**

Stigma marking, or intersecting stigmas, is defined as the application of stigma to individuals or groups based on their differences. Intersecting stigma's themes that were primarily discussed in the focus groups regarding demographics focused on age, gender, sexual orientation and SES and how these characteristics differ regarding mental illness symptoms and experiences of MHS.

**Demographics.** Participants suggested that there is a difference between the way mental illness symptoms are presented and how individuals are stigmatized when they are of different ages, genders, sexual orientations, and SES. Participants indicated that younger individuals present with “more severe” symptoms and are more open to seeking treatment compared to older individuals potentially due to having more access to mental health information. One participant stated, “I think younger people are more likely to seek help and then once you get older it's like, ‘OK, well, that’s just how I am (...)’”. Participants also suggested a difference between genders when experiencing mental illness symptoms and MH, such as men being less willing to discuss symptoms and being emasculated for seeking mental health treatment. For example, a male participant reported, “I would say Black men more so than the Black women... men aren’t supposed to cry”.

Additionally, participants stated that members of the LGBTQIA+ community have more mental health concerns and are more willing to seek treatment compared to others due to increased openness to discussing emotions. One participant commented, “We all know there's a higher incidence of mental illness in that community”. Another participant commented on how being LGBTQIA+ affects MHS: “Intersectionality plays a big role... a gay White man compared to other gay Black people and how they can be perceived is very

different”. Participants also mentioned that many African Americans may have increased stress, anxiety, and MHS experiences (e.g., being treated differently due to a diagnosis) due to living in low-income areas with little accessibility to professional mental health treatment. A participant stated, “(...) some Black people have to live in lower economic status. And therefore, they go through those struggles ten times worse. And a lot of times they have to suffer in silence (...)”.

### **Manifestations**

Manifestations, or experiences of MHS as defined by the Health Stigma and Discrimination Framework, was discussed during focus groups. Participants comments were primarily categorized as ways they and others have been stigmatized, how they’ve stigmatized others, or have witnessed someone else being stigmatized.

**MHS.** Common themes regarding MHS included mental illness being considered a weakness, personal problem, and not real. Other themes included people becoming more knowledgeable about mental health topics, the term “mental health” being stigmatizing, and people either distancing themselves from others or ignoring mental health concerns.

Participants suggested that many African Americans believe that those who have mental illnesses are weak and complaining about their symptoms when compared to others who do not discuss mental health concerns. Specifically, one participant stated, “Just in our culture, you're looked at as pretty weak”. Participants indicated that African Americans may also believe that one’s mental health concerns can and should be solved individually and that African Americans tend to believe that mental illnesses are not real and are the result of someone overreacting. For example, participants commented, “I think that person listening at times is just like, ‘well, that's your problem’” and “A lot of teachers and a lot of other

classmates would say that they're just faking it or doing it for attention". Participants also indicated that many African Americans are increasing their awareness about mental health which may aid in decreasing stigmatizing beliefs leading to increased use of mental health services: "I think if we had more knowledge, then we will get more help".

Notably, many participants indicated that using the terms such as mental health, mental illness and MHS was stigmatizing. For example, a participant commented, "There is a broad range of mental illnesses. Like, being anxious all the time is in mental illness. Like, schizophrenia, as I mentioned earlier. So, I feel like, by saying the word mental illness, like you don't want to come off as like you can't function in a day-to-day life (...)". Additionally, participants made comments regarding African Americans distancing themselves from those with mental health concerns due to not wanting to be associated with someone considered as "crazy". Specifically, one participant stated, "(...) you just call them crazy, or we just try to keep some people away from you. And you know, distance yourself away from people". Lastly, participants suggested that African Americans often ignore their own mental health concerns and others with mental health concerns due to not knowing the person and not wanting to get involved or believing someone else will help: "I was going to say bystanders like they think somebody else would come along and help (...)".

**Table 8**

*Focus Group Themes by Domain Construct Regarding Mental Health and MHS with*

*Participant Quotes*

<b>Domains</b>	<b>Constructs</b>	<b>Thematic Category</b>	<b>Quotes</b>
		Judgement	<p>“Just being an outcast”.</p> <p>“I told my mom some pretty serious thoughts I was having, and she lashed out and, you know, told me I need to get it together (...).”</p> <p>“I think that some people are scared to glorify it. As it's like, ‘if I participate in what you're saying am I adding on to it? Am I making this seem overblown’?”</p>
		Labels	<p>“You've put that label on, people automatically see you as what you are”.</p> <p>“It takes away all, you know, all your gangster because that's all we have is how we look. How we appear in the community to our brother. So, if you put a word on it, then no matter what you wear, people call you that and then you lose all your life”.</p>
	Fear		<p>“Putting labels on stuff makes it real, like, OK. I was sad yesterday, but today the doctor said I have depression. That's a totally different thing. So, maybe straying away from the therapy is straying away from the diagnosis, which is straying away from the accountability of the diagnosis”.</p>
<b>DRIVERS</b>		Being Treated Differently	<p>“You begin to get looked at different from everybody”.</p> <p>“One of the new girls on our team (...) had anxiety or something and she spoke openly about it (...). But I also saw how that kind of messed things up in the team dynamic. And it's so</p>

		<p>sad to see, given that we're working in the mental health space and we're not even safe there”.</p> <p>“Just looking through like, ‘man he crazy as hell’ and they don’t want to fool with you”.</p> <p>“(…) Not dealing with it like, talking to somebody about it, but always them pushing medication”.</p> <p>“They also force mental illness on the Black clients, like they're so quick too. They sign you up for behavior health. ‘Let's get you on medication””.</p> <p>“I want to know a potential end date to the medication, because as far as I'm concerned, I don't know why it's got to be lifelong. All medications have to be lifelong? (…) I can't come off of them at some point””?</p> <p>“(…) when you see a pill bottle and it's kind of like related to, you know, like drug abuse or it could be something else like you're giving yourself mental illness. That's the scary part”.</p>
	Medications	<p>“I would say as much as any other race”.</p> <p>“I think we know. We don't, we don't go actually go deal with it”.</p> <p>“I think that a lot of Black individuals know the places that they can go”.</p> <p>“That's all any podcast, any news feeds talk about. I feel like It's everywhere now”.</p>
	Aware	<p>“We don't. We know we have them, but we don't know what to do with them”.</p> <p>“I definitely think there's a lack of knowledge about mental health, and that's why there needs to be more mental health awareness”.</p>
Awareness	Unaware	

		<p>“Black people, we don't. We just don't know. And when you don't know, where there's no vision, the people perish”.</p>
	Supportive: Family	<p>“I feel like both my family and friends. I'm blessed to say that they will both be super supportive”.</p> <p>“My family and friends for the most part would support”.</p>
	Supportive: Church	<p>“My family will be very supportive. And by my family, I mean, my wife, my kids, my brothers and sisters and my parents”.</p> <p>“Now that pastors are getting younger and younger and they're more in our generation, they support more of their own generation to go seek the help”.</p> <p>“I do see really good churches, Black churches being open about wearing your mask, the COVID thing ... and then actually encouraging mental health. Encouraging them to do something outside of just saying, ‘God is going to do it’”.</p>
	Unsupportive: Family	<p>“The church is becoming more open to the idea”.</p> <p>“I'd say, immediate family in general. (...) It's just like kind of like they're supportive, but then there's like sarcastic comments “.</p>
Social Support	Unsupportive: Church	<p>“Family: it depends on the type of mental health activity”.</p> <p>“(…) someone facing suicide, ‘you should not think about it if you are a Christian’”.</p> <p>“Church. I really wouldn't seek anyone from church because I'm not trying to be on the next gossip blog for the church”.</p> <p>“Then there are the others that just say, like, you know, ‘tarry before the</p>

**FACILITATORS**

Unsupportive: Older Generations Lord, and ask the Holy Spirit to help you”.

“The older generation stigmatize our generation for mental illness”.

“I’ll say a lot of times it depends on if the older generation are educated. Like some of my older aunts and uncles that went to school, they fine. It’s the ones that didn’t”.

“Like if I went to my granny right now, and said anything about mental health, she would be so confused. (...) She would say, ‘we didn’t know anything about that growing up. We did what we had to do and that’s it”.

Teasing from Family/Friends “The generations before us are really not open to it (...)”.

“I do see that going on. It’s more of a joke for people than anything else, and they think it’s funny”.

“(...) because if we capitalize on it, we might see this person tear down and break down, whereas if we laugh on it, he might laugh with us”.

“It’s been like a running joke in the family that I can’t focus on things”.

“People joke about it, you know, like, ‘she’s bipolar’, ‘he bipolar’ or ‘he trippin’, you know”?

Spirituality/Religiosity “(...) ‘aint’ nothing wrong with you’ or ‘you better pray about it’ and that’s pretty much it”.

“You better pray about it, and it’ll be fine”.

Cultural and Social Norms “Being told, ‘you don’t have that. That’s just something that they that they told you. It’s OK. We just gone go to church. We gone, pray about it and you’re going to be OK”.

“Strong Black Man/Woman” “But in our minds, like, ‘I’m going to be good, like I’m a bounce back’, you

know, like, 'I'm going to be good'".

"I think Black women are told to be strong no matter what".

"The stigma of being masculine in talking about going to therapy or whatever (...), people who ain't there yet, they're going to be like, 'Oh, are you really going to go do that'?"

"My father has gotten more emotional as he's gotten older and there has become a disconnect because, you know, there are sometimes where I'm just looking at him like, 'Get it together'. But it's also part of what I've observed as a Black man".

Dismissive

"Boy, I don't think anything's wrong with you".

"(...) I just overlook it. Don't feed into it".

"(...) you completely dismiss it because you're like (...) 'shouldn't nothing be wrong with you'".

"I feel like with the Black community, they kind of just shrug us off".

Cost

"We can't afford it if you don't have the insurance".

"Assume that it's going to be expensive".

"I would say low income".

"You want me to pay my hard-earned money to talk about my feelings (...)"

"There are some free therapy online for Black men. It's all the way booked up. And so, whenever I was going through therapy, at first it was \$70 a pop (...). I got to work extra. That's going to affect my mental health to be able to afford a therapist".

Access to Services

Availability

“It's not accessible in like certain lower socio-economic communities. They don't have access to it. They are booked for years”.

“So, he [a friend] was like, ‘my job has one’. OK, cool. He goes, they are booked (...). He's like, ‘I can't get it until three weeks from now’”.

“Like actually have counselors available”.

Knowledge

“How do we spread information to where it actually gets to the people who actually need it. Who only got regular TV. Who don't got the internet”.

“I feel like they're trying to introduce it now that you're like an adult and it, like it's never been a thing in your life. So, it's like, ‘I've never done that’”.

“Not even knowing who to call or how to get help”.

“(…) if people are unaware, how would they know somebody is bipolar, schizophrenic, are dealing with depression or anxiety if they don't know what the signs of looking for”?

“Therapy is a big mystery for a lot of African-American individuals”.

Mistrust/Comfortability

“You paying the White man your money. Like what are you doing”?

“It helps the pharmaceutical companies be able to capitalize on that”.

“(…) the Tuskegee experiment, right? (...) So, I think people are still worried about, you know, ingesting stuff in their body because of that”.

“Having the trust of someone. Like that facility or the provider”.

<b>Stigma Marking</b>	Intersecting Stigmas (Demographics)	Same Race Providers	“(…) when we do get there to the doctor, we don't have doctors that look like us”.
		Age: Effect on Symptoms	“They have to look like us or we not going to pay attention to it because I definitely would not”.
		Age: Effect on MHS	“Trust in mental therapists and people that really don't know you, that don't look like you”.
		Age: Effect on MHS	“I feel like when you're younger too, it's more severe”.
		Age: Effect on MHS	“When you are a bit older, you're more informed and you can clearly see from the background, especially when it stems down to family”.
		Age: Effect on MHS	“I think younger people are more likely to seek help and then once you get older it's like, ‘OK, well, that’s just how I am’, you know”?
		Age: Effect on MHS	“The kids nowadays have an easier and harder because of the access to so much information”.
		Gender: Effect on Symptoms	“I think the young and the younger generation now is more in tune with knowing if they're willing to go”.
Gender: Effect on Symptoms	“Black woman, depression and anxiety shows up as irritability and anger. And I think the same thing for Black men”.		
Gender: Effect on MHS	“I think a man client will present as if they are OK or they're trying to be strong. I think a woman is going to be more emotional”.		
Gender: Effect on MHS	“I would say Black men more so [stigmatized] than the Black women (…) men aren’t supposed to cry”.		
Gender: Effect on MHS	“I think it's easier for a woman to be stigmatized more than a man”.		
Gender: Effect on MHS	“Showing any type of emotion. Either you’re overemotional or you’re erratic where you're this angry Black		

	woman”.
Sexual Orientation: Effect on Symptoms	“We all know there's a higher incidence of mental illness in that community”.
Sexual Orientation: Effect on MHS	“I think more people who are more homosexual, maybe who more willing to go seek help”.
	“A homosexual man (...) is probably more in tune with his opinion and oftentimes heterosexual men (...), it's not really about our opinion”.
	“Intersectionality plays a big role (...). A gay White man compared to other gay Black people and how they can be perceived is very different”.
SES: Effect on Symptoms	“(…) some Black people have to live in lower-economic status. And therefore, they go through those struggles ten times worse. And a lot of times they have to suffer in silence (...)”.
SES: Effect on MHS	“When someone you know, decides to take their own life, it doesn't just hit one person or the family. It hits a whole community (...)”.
Weakness	“You're stupid or you're slow or you're weak”.
	“Just in our culture, you're looked at as pretty weak”.
Personal Problem	“People just being soft”. “I think that person listening at times is just like, ‘well, that's your problem’”.
	“Mental health issues are just a resiliency issue”.
	“You playing’. You know, they start comparing they life”.
	“There’s an expectation for you to either of not laugh it off, but sort of like gloss over it”.
Not a Real Thing	“B.S. and it ain’t real”.

**Manifestations**

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MHS

“They say, ‘depression isn’t real, or anxiety isn’t a thing you just need to calm down’”.

Becoming More Knowledgeable

“A lot of teachers and a lot of other classmates would say that they're just faking it or doing it for attention”.

“It's more common than we first realized”.

“I think that definitely since like going to therapy myself and like working in the mental health space, I'm more receptive to talking to people or just being more understanding and maybe not as stigmatizing”.

The Term MHS

“I think if we had more knowledge, then we will get more help”.

“Something about the word mental illness and like mental health that just, I don't know (...). Even trauma sounds better. Therapy sounds worse than counseling for some reason”.

“There is a broad range of mental illnesses. Like, being anxious all the time is in mental illness. Like schizophrenia, as I mentioned earlier. So, I feel like by saying the word mental illness like you don't want to come off as like you can't function in a day-to-day life (...)”.

“So, it's like where's the line that we're drawing in terms of what is isn't mental illness versus just life's ups and downs”.

Distance Themselves

“There's also a possibility that the different types of mental illness are not separated. Crazy is crazy”.

“I feel like you kind of just like stay away from them”.

“(...) you just call them crazy, or we just try to keep some people away from you. And you know, distance yourself away from people”.

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Ignore It/Them

“People are crazy. Like stay over there”.

“We don't. We don't go actually go deal with it”.

“I might turn a blind eye, unfortunately, because I don't know you. I'm not going to approach you”.

“I was going to say bystanders like they think somebody else would come along and help. ‘Because I thought of if I don't do it somebody else will’”.

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## **VR Focus Group Findings**

During the focus groups, participants were shown the VR simulation created for this study. They discussed their sense of embodiment and story transportation during the VR experience. Themes and related participant quotes are shown in Table 9 and are summarized below.

An overwhelming majority of participants expressed they were easily able to understand the intricate narrative within the simulation as well as a genuine sense of embodiment as they became the simulated character. Participants shared, “[the simulation] made me feel exactly what a person with high anxiety or whatever, you know, feels or goes through by their day by day” and “I was like breathing and praying doing all that stuff. I was actually doing it. When I was praying, my eyes was closed”. Participants were also asked about the most impactful and frustrating parts of the simulation. They primarily expressed that seeing the heart rate meter, the helping hands (coping mechanisms, e.g., prayer, deep breath, meditation, fresh air), and the quotes from friends and family at the cookout as being the most impactful due to how real each aspect felt. A participant stated, “(...) having the different options like that you could choose from, like the praying, the meditation. That was helpful because it kind of puts in your mind like, ‘OK, well, when I'm going through this for real, what can I do to re-center myself’”? Many participants also stated that getting into the closet, picking out clothes and putting them on the bed was the most frustrating part of the simulation due to the difficulty in using the animated hands or the Oculus Quest controllers to complete these simulated tasks. For example, a participant noted, “It took me a long time to get into my closet because I can't, you know, I kept having to back up and go back and check things out “.

**Intentions following VR simulation.** Post-survey quantitative data indicated slightly decreased levels of MHS from the baseline survey. However, during the focus group discussion, most participants indicated that their MHS beliefs and attitudes changed due to the focus group and not specifically because of the simulation. Participants stated, “I would say the stigma has changed based on the focus group not on the simulation” and “You know, I thought it [MHS] was serious before. So, if anything it enhanced, heightened”. Participants commented on how, after embodying a character with a mental illness diagnosis and experiencing specific mental illness symptoms (e.g., feeling on edge, difficulty concentrating) in the simulation, they were more understanding and empathetic of other’s struggles with mental health concerns.

**Table 9**

*Focus Group Themes Regarding VR with Participant Quotes*

<b>Domains</b>	<b>Constructs</b>	<b>Thematic Category</b>	<b>Quotes</b>
		Yes	“I felt like I was in it”.
			“It was real. I can envision everything that happened at that barbeque”.
			“I was like can it actually like tell my heart”?
<b>VR Measures</b>			“I was like breathing and praying doing all that stuff. I was actually doing it. When I was praying my eyes was closed”.
	Sense of Embodiment/Story Transportation		“Made me feel exactly what a person with high anxiety or whatever, you

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		know, feels or goes through by their day by day”.
	No	“I wasn't stressed or feel like I didn't feel like I was in it, but I was talking with them. I understand now what it's like for somebody else”.
	Heart Rate	“Definitely the heart rate because I have experienced that as well”.
		“It was definitely the heartrate as well. Not only the heart rate, but it was after doing something and then still checking the watch, and it only went down like about five or 10”.
	Statements from Simulated Family/Friends	“I would say when the words popped up and you're seeing all those things come up, the people said about you, but also somethings I was like, ‘I might have said that before’. So, I thought it allowed me to look inward again”.
Most Impactful Part of Simulation		“And like reading my thoughts, I think that kind of distract me. So, ‘I'm trying to do something, but you keep on going off”.
		“Little like sayings that were started coming across the screen like actually impacted me”.
	Helping Hands	“The way the person was breathing”.

Most Frustrating Part of  
Simulation

“(…) having the different options like that you could choose from, like the praying, the meditation. That was helpful because it kind of puts in your mind like, ‘OK, well, when I’m going through this for real, what can I do to re-center myself’”? “I felt like I was getting frustrated with the clothes”.

“It was not being able to find the pants I definitely went back to the closet more than three times”.

“It took me a long time to get into my closet because I can’t, you know. I kept having to back up and go back and check things out “.

“To relocate. I was teleporting, I don’t know what I was doing, but I was everywhere”.

“I would say not be able to leave when I wanted to leave, I feel like when you’re anxious a lot of times we have a tendency to like flight”.

“I would say the stigma has changed based on the focus group not on the simulation”.

Change Due to Simulation

“You know, I thought it was serious before. So, if

anything it enhanced, heightened”.

“Yeah. It definitely gave me a clear idea of what anxiety is. You know, I've always seen anxiety as like the physical bodies of response – the hyperventilating and increase heart rate, you know those thoughts. I really thought everyone just had thoughts like that, you know”.

“Yeah, I mean, because for me, like it just gave me, like I was able to see how much support really matters”.

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### **Intervention Strategies**

Participants were asked about potential strategies to address MHS with African American young adults. They made suggestions that included their own ideas for potential VR simulations including having levels, like a video game, that an individual must conquer before moving on. Specifically, a participant responded, “I think a good intervention will require (...) you got to go through this virtual reality simulation and pass it, whatever that might look like, before you can get ready to go to work or before you can get ready to go to class (...)”. Another participant shared a potential simulation focused on “someone having to deal with their own mental diagnosis and while having to work within the confines of their family”.

Although majority of participants endorsed belief that VR should be used to address MHS and other mental health topics, participants also provided other thoughts regarding intervention strategies that focus on making mental health literacy more accessible and normalized among African Americans. Examples of these strategies included: “Making games (...) something that's accessible on your phone”, “(...) some type of emphasis on mental health (...) implemented into even the [school] curriculum”. Lastly, participants expressed the need to have more mental health focus groups as an attempt to normalize discussing aspects of mental health with peers: “Have more stuff like this [focus groups]. (...) I feel like this will be a steppingstone for getting people to understand and just talking about it and hearing the different views”.

### **Observations**

During the focus group discussion and participant engagement in the VR simulation, field notes were taken on observations of participant reactions. There are several themes observed through the focus groups including the difference between when participants knew others within the group, sex or gender differences in how the participant reported their VR and focus group experience, and discussion about thoughts of jumping off the balcony while getting “fresh air”. First, it was observed that focus groups that included more participants who were not familiar with each other elaborated on mental health and MHS beliefs or experiences less than groups who were more familiar with each other. There was also increased difference in participant beliefs or attitudes regarding mental health when the group was less familiar with each other. Groups who were more familiar with each other had similar thoughts regarding mental health and MHS and were more open to discussions regarding difference in opinions among group members.

Second, male participants were observed to better understand how to use the VR equipment to navigate through the simulated room and respond to the simulation prompts compared to female participants. Many male participants commented on how they viewed the simulation as a video game they wanted to win while female participants commented on how they were discouraged at not being able to maneuver through the simulation easily and could not win at the end. Male participants were also more likely to state that the focus group discussion helped them to change their MHS beliefs opposed to the VR simulation whereas females were more likely to discuss change in MHS beliefs due to the simulation. Additionally, two female participants commented on how VR should not be used to address mental health and MHS concerns in the future due to it being confusing for them to engage in. However, most participants commented on how using VR could be useful for these topics. Lastly, around two participants in each group discussed thoughts about how they believed the simulation may have wanted to see if they would jump off the balcony within the VR simulation. Many participants agreed with having similar thoughts and reported that this thought was simultaneously intriguing enough to try and frightening. The VR simulation did not allow for participants to react to this thought.

## CHAPTER 4

### DISCUSSION

To our knowledge, this is the first study to examine perceptions regarding MHS with African American young adults using a mixed methods approach with quantitative and qualitative measures. This study also uniquely explored shifts in MHS beliefs by using a culturally tailored VR simulation that focused on the experience of an African American young adults who had been diagnosed with GAD and had received stigmatizing comments from family/friends, which resulted in anxiety symptoms (i.e., fatigue, trouble concentrating, feeling on edge) when ruminating on their comments. Additionally, this study explored potential MHS reduction intervention strategies and whether VR could be a useful MHS intervention tool to help young African American adults better understand and have empathy for persons living with mental health concerns.

Overall, a large proportion of this study's African American young adult sample reported they had previously visited a mental health professional, discussed mental health with others at least once in the past 12 months, and believed mental health was a serious issue, which contrasts with the literature. Previous studies indicated that African American young adults are less likely to seek professional mental health treatment due to medical mistrust, limited access and MHS (Hankerson & Weissman, 2012; Marrast et al., 2016; Planey et al., 2019; Conner et al., 2010). This contrast may have occurred due to the present study's participants having a higher level of social support from others to seek professional mental health treatment which has been shown to be instrumental in treatment seeking among African American young adults (Hankerson & Weissman, 2012; Lukachko et al.,

2015). Additionally, as reported on the brief survey, participants experienced moderate levels of mental illness symptoms (e.g., depression, anxiety, stress) and most had visited a mental health professional. However, during focus group discussions, many participants stated they did not have personal experiences with mental illness diagnoses but had heard about other's experiences or witnessed others deal with their mental health concerns. This suggests that some may have been uncomfortable disclosing their diagnoses with the group, may have minimized their mental health concerns, or had not received a diagnosis after seeking treatment. This is consistent with literature that reports that many African American young adults are often misdiagnosed or underdiagnosed after seeking professional mental health treatment (Sauceda et al., 2021), which could discourage future use of professional services. Additionally, there was a slight discrepancy between groups of peers compared to groups of strangers. This could be due to group polarization and having like-minded individuals discussing one topic potentially resulting in stronger mental health and MHS beliefs following discussion. Although there was no difference between if the PI was familiar with the participants or not observed, this could be a potential concern in future studies.

Previous literature also indicates that many African American young adults may not be comfortable disclosing their mental health concerns with others due to several factors including fear of discrimination or being negatively judged by others, privacy concerns, and preference for informal support (Broman, 2012; Watkins et al., 2011). Additionally, most participants in the present study had health insurance coverage, moderate levels of awareness of when and how to receive treatment, and moderate levels of perceived access to professional mental health treatment. Therefore, this study's sample may not have been representative of most African American young adults without these protective factors (e.g.,

health insurance, awareness, access to treatment, social support). Future studies should consider a more diverse sample of African American young adults with a wider range of risk and protective factors for mental health treatment seeking and MHS in order to increase generalizability.

This study's quantitative and qualitative data findings suggested there was moderate to high MHS among participants. This is consistent with many studies that have reported that African American youth and young adults have significant negative beliefs regarding mental health and about those who have mental illnesses (Goodwin et al., 2016; Masuda, 2012). This study's participants commented that mental illnesses are perceived by African Americans as a weakness, a personal problem, or not real. Participants also stated that many African American young adults would prefer to distance themselves or ignore individuals with mental illnesses and ignore their own mental illness symptoms. Larger studies have also reported similar MHS beliefs and behaviors among the general African American population (Villines, 2020; Ward et al., 2013). More specifically, Goodwin and colleagues (2016) reported that African American youth and young adults had increasing negative MHS beliefs, including that seeking professional mental health treatment was a weakness, after observing individuals with mental illness symptoms. These and the current study's findings suggest that there is limited empathy and understanding for individuals with mental illnesses which may result in increased levels of fear regarding mental health topics. Furthermore, simply observing individuals with mental illnesses is not enough to help with building empathy. Future researchers should address empathy among African American young adults through culturally tailored VR simulations, because they are more tangible than observations. Researchers should also focus on creating interventions that aid in increasing the saliency of

mental health in African American young adults by helping them identify personal mental illness symptoms or concerns.

Notably, participants' MHS decreased slightly following participants' engagement in the VR simulation. Participants indicated that they learned what others with mental illness symptoms can experience, especially after encountering stigmatizing interactions. Additionally, many participants stated they have had personal experiences with the symptoms presented and therefore may have been able to better embody the simulated character and recognize their associated MHS beliefs. Results also indicated a significant correlation between MHS and sense of embodiment and story transportation. Of note, participants indicated that the simulation was realistic and relatable due to the cultural tailoring of the story presented during the simulation. Participants stated, and the PI observed, that most participants physically embodied the simulation in real time as evidenced by bowing their heads, closing their eyes, and saying amen after a prayer or taking deep breaths – the overall goal of sense of embodiment and story transportation. The culturally tailored stigmatizing comments within the simulation were familiar to the participants, which may have contributed to their sense of embodiment and story transportation. Participants may have agreed with the stigmatizing comments, stated these comments themselves, or been a victim of receiving these comments. Also of note, participants commented that after the VR experience, they would be more likely to seek professional mental health treatment, be ready to see a mental health professional, encourage others to seek professional care and change the way they treat others with mental health concerns. These results suggest that a culturally tailored VR experience has potential to be a powerful tool to help African American young adults learn about and understand the impact of stigmatizing beliefs and increase service

seeking attitudes. Bearing in mind participants' comments on how the focus group shifted their MHS beliefs more than the VR simulation alone, researchers should consider including the focus group within the VR simulation by having study participants engage in a discussion about mental health within the simulated room. Future studies should consider expanding on this study by creating new simulations for different mental illness diagnoses prevalent in African American young adult populations (e.g., MDD, PTSD, drug and alcohol addiction). Researchers should also consider using VR to address MHS in a longitudinal study to examine how change in MHS behaviors and attitudes occurs, and possibly, is sustained over time.

The present study indicated that VR can be a useful tool in addressing MHS concerns among African American young adults. Most participants endorsed prior use of VR equipment, which is consistent with the literature that has reported that young adults are more likely to engage with this type of technology compared to other age groups (e.g., Blagojević, 2022). This study found the VR measures, sense of embodiment and story transportation, to be correlated with several constructs measured. Correlational analysis indicated a positive correlation between age and story transportation. Past reports have found that VR may be misunderstood or more difficult for older individuals (Liu et al., 2020; Plechatá et al., 2019), but could be widely accepted by young adults, making this group an optimal sample for combining VR and mental health concepts. Additionally, depression, anxiety and perceived stress were significantly correlated with story transportation and stress had an additional correlation with sense of embodiment. Participants commented on how the VR simulation made them feel anxious and stressed. These findings suggests that those who have prior experience with some mental illness symptoms may be more likely to understand

and actively engage in the VR simulation. This also indicates that VR can be used with individuals who have prior mental illness symptoms or have basic knowledge of mental health symptoms to help them better understand mental health topics and normalize mental health concerns among African American young adults. Studies have found that VR technology has been helpful in assessing for mental illnesses, lowering mental illness symptoms and understanding triggers for depressive and anxiety disorders (Aymerich-Franch, L. et al., 2014; Freeman et al., 2014). However, these studies did not measure participant VR experiences. Future research examining VR technology and mental health concepts should prioritize measuring participant experience, including sense of embodiment, story transportation, user friendliness, for continued improvement on VR simulations used to target various aspects of mental health. Researchers should also consider developing an observation guide to note participant differences (e.g., gender, age, familiarity with others in the group, vocalizations and physical reactions) during the focus group discussion and VR simulation which may inform the future design of MHS interventions for African American young adults.

Participants suggested that VR technology should be used as a tool to address MHS and other mental health related topics. During the focus groups, participants commented on their beliefs that many African Americans have little to no knowledge about mental health, including how to seek professional mental health treatment, and this resulted in increased MHS and limited treatment seeking. These comments were consistent with literature that states that African Americans have average to below average mental health literacy (Muvuka et al., 2020; Cheng et al., 2018). Participants found the focus group discussions and VR simulation to be informative on how others perceive and experience mental illness and how

MHS can affect mental illness symptoms. However, participants commented on how difficult some portions of the VR simulation were to maneuver. Some had difficulties using the VR equipment to open doors, grab objects, and transport to different areas in the room, possibly due to the limited instructions given. Future studies should address this issue by including detailed instructions on how to use the equipment before beginning VR simulations and creating a practice simulation to allow participants to get comfortable with the equipment. Future studies should also consider using the Oculus Quest setting that allows players to cast their simulation onto a TV screen which would allow researcher to guide participants through the simulation. Additionally, there was some concern as to how to make interventions using VR technology accessible to African American young adults. This issue can be addressed by making the VR simulation compatible with a smartphone-based VR headset which is much cheaper than standalone and PC- powered VR headsets. VR technology can also become more accessible if it is adapted into a school system or curriculum where the school district provides funds for their students to experience mental health VR simulations as part of their health-focused curriculum.

Guided by the Health Stigma and Discrimination framework, several other salient themes emerged from the focus groups. First, participants suggested several fears as potential drivers for MHS including being judged, acquiring labels, being treated differently and having to take medication if being treated for a mental illness. Most of these fears have been previously identified as barriers or stigmatizing beliefs in the literature (Pescosolido & Martin, 2015; Watkins et al., 2015). In contrast, data from the brief survey indicated that participants endorsed low to moderate levels of fear. This could be due to the measurement of fear in this study being geared toward medical mistrust while the fears that were

commonly mentioned were more so focused on how society views and treats individuals with mental illness. Future studies should include measurements for fear that specifically target how African American young adults may fear how society would treat them if they had a mental illness. Additionally, correlational analysis indicated that fear was positively correlated to sense of embodiment and story transportation during the baseline survey. Post-survey data indicated slightly lower levels of fear along with positive correlations between fear and story transportation and MHS. This suggests that VR can be useful in helping individuals identify fears regarding aspects of mental health and potentially aid in reducing the fears to decrease MHS. Additionally, participants were potentially able to experience a shift in MHS and may have increased their empathy and understanding of individuals with mental health concerns following the simulation. Researchers should further examine why these fears are common among African American young adults and create VR simulations that explore the fears across various settings (e.g., work, school), with different mental illness diagnoses (e.g., MDD, PTSD), and varying sources to deliver the stigmatizing comments to understand if the fears are associated upon these variables.

Second, regarding the driver of social support, participants believed that family, the church, and older generations may influence MHS and treatment seeking behaviors by either providing support or discouraging them from seeking treatment. They indicated high levels of social support in the brief survey and stated that each of these groups have been both supportive and unsupportive of them seeking professional mental health treatment or discussing their concerns. Consistent with Christensen et al. (2017), participants also believed that the older members of their family and church were the most unsupportive due to lack of knowledge, disbelief, or a preference for religious coping. They also made

comments on how, after the simulation, they realized how impactful the negative statements from friends and family were and how important support is for someone dealing with mental health concerns. This is consistent with previous literature indicating that lack of social support from an African American youth's community can be detrimental to treatment seeking resulting in mental illness symptoms increasing in severity (e.g., Planey et al., 2019). These findings suggest that referents' negative viewpoints regarding mental health concerns for young African Americans can potentially have harmful effects on how an individual experiences mental illness. Additionally, correlational analysis indicated a significant positive relationship between social support and story transportation and MHS in the baseline and post-survey. This suggests that VR technology has the potential to be used to educate on the negative consequences of stigmatizing comments and has potential to convey the importance of potential preventative MHS actions, such as providing social support. Studies should consider using VR as a resource to advocate for family and friends to support significant others with mental health concerns through engagement in VR simulations and should assess for friends and family's intent to provide future support following the simulation.

Third, participants endorsed moderate levels of cultural (e.g., religious activity and coping) and social (e.g., discrimination) norms in the brief survey and shared several cultural and social norms as potential facilitators for MHS including teasing, endorsing spiritual or religious solutions, being a "strong Black man/woman", or dismissiveness. They commented on how these norms have been personally used, yet unhelpful, by themselves and their peers. Previous studies have reported that many African Americans believe that family and friends would tease them if they sought professional mental health treatment (e.g., Samuel, 2015).

Additionally, studies have found that the “strong Black man/woman” schema has negative physical and psychological health outcomes (e.g., high blood pressure, stroke, violence, illicit drug use; Watson & Hunter, 2016). Together, these findings suggest that African Americans may use these cultural and social norms to cope with mental illness and MHS without knowing the potential effects of these coping mechanisms. Notably, correlational analysis indicated a significant positive correlation between social norms (e.g., discrimination) and sense of embodiment and story transportation. This suggests that prior experience of discrimination may help the participant to better understand the feelings of the character in the VR simulation. This also suggests that focus group discussion and VR simulations can help African American young adults acknowledge their role in MHS behaviors. Future VR studies should examine new ways to highlight cultural and social norms such as teasing and presenting as a “strong Black woman/man”, and present better alternative culturally appropriate, positive ways to conceptualize and cope with mental health concerns.

Fourth, participants identified barriers to accessing mental health services such as cost, knowledge of how or when to seek treatment, mistrust and accessibility of same race providers. They also commented that if they knew where to find treatment, they, or their significant others may not be able to afford it regardless of acquiring insurance. This has been supported by previous studies that report cost of care and mental health literacy as a leading barrier in professional mental health treatment seeking (e.g., Kawaii-Bogue et al., 2017; Muvuka et al., 2020; Cheng et al., 2018). Future researchers should use VR technology to educate individuals on mental illness symptoms and the benefits of treatment to potentially increase professional mental health service seeking. Practice solutions to these barriers may include providing information on and referrals to African American mental health

professionals who provide treatment on a sliding fee scale at local medical facilities, emergency rooms along with providing this information in community-based settings that are highly trusted by young African Americans (e.g., churches, barbershops).

Lastly, studies have found that many African Americans and African American young adults have high levels of medical mistrust and prefer mental health providers of the same race and ethnicity (Conner et al., 2010; Goode-Cross & Grim, 2014). Although, participants endorsed low to moderate levels of access to services (e.g., knowing how and where to receive help), this slightly increased following the focus group discussion and VR simulation. However, this study's correlational analysis did not indicate a significant relationship between access to services and the VR measures, possibly because the VR simulation storyline did not directly address accessing mental health services. Nonetheless, these results suggest that African American young adults may be willing to seek professional mental health treatment if these barriers were addressed. Future studies should consider specifically addressing medical mistrust in VR simulations by having the participant embody a character who is receiving treatment from a trusted source while also displaying why the source is trusted based on cultural norms. Researchers should also consider expanding on this study and directly addressing access to services by including an option to seek professional mental health treatment as a helping hand or coping skill within the simulation and assessing how many participants chose this option.

### **The Role of VR in Future Interventions**

As stated previously in the text, VR technology has been used to address mental health, particularly to enhance assessments and treatment for specific mental illnesses. However, few researchers have used VR technologies as interventions to address barriers to

mental health treatment, such as MHS, and none have addressed these concerns with African American young adults. There are several key findings from the results of this study that can be used to assist in designing VR-based mental health and MHS interventions. First, VR technology, specifically the culturally tailored VR simulation used in the present study, has potential to decrease MHS. Results in this study indicated that MHS slightly decreased following engagement with the VR simulation. It is possible that a larger decrease may be seen with increased exposure to VR simulations that are similar in nature regarding exposing participants to symptoms of different mental illness diagnoses and/or more intense activities within the simulation. Second, VR simulations can be used to educate individuals about different aspects of mental health (e.g., symptoms, coping mechanisms, external effects on the diagnosis). VR technologies are currently being used for professional trainings and general education in different industries (Thompson, 2022). Educating through VR technologies is an innovative way to have life-like experiences without an individual having to physically be present in a specific environment which may be more attractive to a younger crowd or those dealing with intense anxiety. Additionally, participants commented on how many African Americans and African American young adults are unaware about aspects of mental health and are triggered by mental health terms (e.g., mental health, mental illness, therapy) possibly due to lack of education, available resources for education and MHS. Consideration should be given to how specific terms can exacerbate issues related to MHS. More work is needed to evolve terms associated with mental health to reduce negative attitudes and beliefs that may result in MHS and decreased professional mental health treatment seeking.

Third, a VR simulation can possibly be used to provide opportunities for significant others of individuals with mental health concerns to better understand mental illness symptoms. Following the VR simulation, one participant specifically stated, “I would love for everyone I know to just go through that (...). It would definitely help for people who think that people with mental health issues can just kind of walk out”. Additionally, many participants suggested that the VR simulation could be tested as an intervention to help improve awareness about common mental illness symptoms and to help decrease MHS among African American young adults. Increased symptom recognition among African Americans may also result in increased professional mental health treatment seeking. Furthermore, researchers may also consider using this type of intervention within family support groups, police officers, caregivers and others who may have frequent contact with individuals with mental health concerns. This can be achieved by tailoring the VR simulation to display common situations for each specific setting (e.g., after school, a traffic stop, public settings). Lastly, this study indicated that culturally tailoring VR simulations is important for sense of embodiment and story transportation. Many participants stated they felt they could hear and understand everything that happened at the cookout. Making the story culturally relevant to the participants’ personal experience or culture allowed them to better picture themselves as the simulated character and/or self-reflect on how they may have responded similarly to the family and friends in the simulation. Not only did participants comment on how they could relate to the simulation, but they also learned about mental illness symptoms, the importance of social support and had an enjoyable and memorable experience.

The results from the present study indicate that using VR to address mental health and MHS can be a helpful tool for future interventions. However, results also suggested that

proper precautions need to be in place to maintain participant safety. Specifically, future studies should address caution and safety measures regarding thoughts of jumping, unanticipated increases in MHS beliefs, and safe use of equipment by screening for suicide for participant eligibility, discussing these thoughts in focus group discussions and identifying an appropriate space for participation in the VR simulation (e.g., enough space for more than one participant at a time, space to sit, stand or walk).

The field of psychology has been slower to use VR to address mental health compared to other industries. Over the next five years, there will be a higher demand for VR usage in the healthcare industry in general (Fortune Business Insights, 2021). It is important for psychology researchers to further explore the utility of VR in mental health settings to learn the capabilities for treatment, education, and assessment. More use of VR technology in these and other appropriate settings (e.g., schools, police training) may also aid in increasing the availability of VR software and other tools necessary for research and practice. As research increases on using VR to understand mental health, researchers should consider making data and VR simulations available for other researchers through open science to increase awareness and dissemination. Future practice could also make findings and VR mental health activities available for non-researchers through smartphone applications, websites, or blogs to help individuals learn about the findings from these studies and engage with VR to increase acceptability and accessibility of using VR technology.

### **Limitations**

The present study had several limitations. One of these limitations includes potential limited representation of persons diagnosed with a mental health condition. Most participants had low to moderate levels of anxiety and depressive symptoms, contrary to previous

literature regarding anxiety and depression diagnoses among African American young adults (APA, 2021; MHA, 2020). Researchers should consider expanding on this study by examining a sample where a prior mental illness diagnosis is included in the eligibility criteria or testing the simulation on individuals with specific diagnoses before administering to participants, to better understand how the VR simulation translates to authentic mental illness symptoms. Additionally, participant responses in the focus group might have been influenced by social desirability biases, potentially leading individuals with contrasting attitudes or beliefs to withhold their perspectives from the larger group due to fear of judgement or feeling embarrassed. However, this information could not be obtained during the study. Another limitation is the measure used for fear. Quantitative data were collected for fear using a reliable medical mistrust scale (LaVeist, 2009); however, the fears shared during focus group discussions were more about societal fears. This was similar for the measure used for social norms. This study used social norm measures that assessed experiences of discrimination and harassment opposed to social norms discussed in focus groups (e.g., people being dismissive, teasing, “strong Black man/woman” complex). The focus group discussions focused on internal social experiences and were used interchangeably with cultural norms. Additionally, the baseline survey did not assess for level of intent to either seek or encourage others to seek mental health services and change the way they treat others with mental health concerns. Last of the limitations includes the limited budget funds available which may have limited the ability to include more features (e.g., a helping hand suggesting speaking to a professional) and increase the functionality of the VR simulation. With an increased budget, the VR simulation could have been more user-friendly and resulted in increased sense of embodiment and story transportation.

## **Conclusion**

To our knowledge, this was the first study to examine the use of VR to address MHS among African American young adults. Despite the sample being largely insured, having higher levels of mental health awareness, perception of access to services and social support compared to other young African Americans, most participants had moderate to high levels of MHS. This study also found that participants engaging in the culturally tailored VR simulation and focus group discussion were able to fully embody the simulated character, had increased empathy for persons experiencing mental illness, and had a decreased level of MHS beliefs. Findings from this study suggest that VR has great potential to be an acceptable, feasible intervention strategy to educate individuals on mental health topics, shift MHS beliefs, and should be considered in the design of future mental health interventions with African American young adults.

## APPENDIX A

### FOCUS GROUP DISCUSSION GUIDE

Prior to beginning with the welcome for the focus group, participants will be asked to:

- Help themselves to a meal, which will be available in the meeting room.
- Write whatever first name they would like to use on a table tent.

Focus group moderator and assistant will: mingle with participants, encourage participants to get their meal, find a seat where they are comfortable, and ask participants to write a pseudonym on the table tent in front of them.

#### **Welcome Statements**

Good afternoon/evening! Thank you for taking time to talk with us about mental health, MHS, and African American young adults. My name is Tacia Burgin. I am a fourth-year doctoral student in the clinical psychology program at UMKC. Assisting me is [*name of study staff*]. We're with the University of Missouri-Kansas City School of Medicine. Our study is trying to figure out what is needed to develop tailored MHS interventions to decrease MHS among African American young adults. You've been invited because we are interested in getting your input on the factors that may contribute to MHS and strategies for designing and implementing culturally tailored MHS interventions with African American young adults.

We'd like your help to learn more about your perceptions and previous experiences with MHS, the importance of MHS, and what would be helpful in an attempt to decrease MHS among African American young adults. There are millions of African Americans who

are affected by mental illness and what you share with us today can be used to help improve community mental health by finding ways to decrease MHS and potentially increase treatment seeking and positive health outcomes. We are having meetings like this one with several groups of African American young adults here in the KC area.

You are the expert(s), so what you have to share is very important to us. Please make sure to respect the opinions of others, but you should feel free to share your opinions even if it differs from what others have said. While you may have different opinions, there are no wrong answers to these questions. We want to hear from everyone -- even when you may not agree with others. We have about 8-10 questions that we want to discuss over the next 1 1/2 to 2 hours. To make sure that we hear from everyone, there may be times when I move the discussion along.

You've probably noticed the digital recorder. We are recording the session, because we don't want to miss any of your comments. People often say very helpful things in these discussions, and we can't write fast enough to get them all down. We will be using these pseudonyms, and we won't use any names in our reports. The report of this discussion will be used with our research group and community partners to help plan future efforts in the area of community-based mental health programming. You may be assured of complete confidentiality. Okay, let's get started. The name cards on the table in front of you are to help us remember each other's fake names.

**Mental Health Background:**

I'll start by sharing some information on African Americans and mental health:

African Americans represent 13.3% of the population and made up 16% of U.S. adults affected by mental illness in 2020. In addition, the level of unmet need for professional

mental health services is higher among African Americans compared to White Americans and even higher for African American young adults compared to older African Americans and White Americans of any age. Furthermore, young adults had the highest prevalence rate of any mental illness in 2020 compared to all other adult aged populations. African American young adults are disproportionately affected by depression and anxiety disorders and suicidal behaviors compared to White young adults.

### **Transition Question**

1. Let's begin by talking about some of the experiences you or others have had/seen regarding MHS. Have you ever experienced MHS from someone after disclosing a mental illness or wanting to seek a mental health professional? Have you ever heard someone stigmatizing someone else for having a mental illness?
  - How did you feel hearing these comments? What was the outcome? Did you or they seek help?

### **Focus group questions related to the Health Stigma and Discrimination constructs**

#### **Drivers**

2. Fears: What are some of the things African American young adults fear about having a mental illness? What about fears regarding MHS?
  - Describe any negative outcomes and/or bad things that could happen to you or other community members from having a mental illness or experiencing MHS.
  - What would you want or expect to happen if you received a mental illness diagnosis? If you or someone you knew disclosed a mental illness diagnosis to friends/family/coworkers? If you experienced MHS in a public setting?

- What else comes to mind when you think about being fearful regarding your or someone else's mental health?
3. Awareness about mental health: How would you describe African American young adult's knowledge about mental health concerns? Knowledge about MHS?
- Where did this knowledge come from?
  - How has this knowledge or information affected the community?
  - How important is mental health within the community? Why?
  - How does this affect MHS?
- What kind of symptoms would make you seek mental health care?
4. Social support: Now let's talk about who would be supportive or not so supportive of you seeking mental health services.
- What people, groups, or organizations *would not* be supportive of you and other community members who have mental illness diagnoses or concerns?
  - What people, groups, or organizations *would be* supportive of you and other community members who have mental illness diagnoses or concerns?
  - On a scale of 1 to 10, how motivated would you be to receive mental health screening or care with the support of others?

### **Facilitators**

If you or others desired, there are some things could make it harder or easier to seek mental health screening or care, or to disclose a mental health condition with others.

5. Cultural norms/Social norms/inequality and access:

- What personal and community factors/circumstances would make it harder or impossible to seek or mental health services? (Prompts if needed: lack of access, cost of care, not a priority compared to other things going on in life, preference for other methods of care, discrimination, transportation?)
- What personal and/or community factors would make it easier to use mental health services (e.g., availability, assuredness that your disclosures would not be shared with others, culturally tailored interventions, same race/ethnic provider)?
- What about disclosing a mental health illness with family and friend? What would make it more difficult? Easier?

### **Stigma Marking**

6. On a scale of 1-10 how much does gender, age, and sexual orientation play a factor when thinking of how an individual experiences mental health (e.g., symptoms, decisions about treatment, disclosing mental health condition to others)?

### **Manifestations:**

7. MHS beliefs:
  - What are some of the beliefs that the African American young adult community has about mental illness?
  - What are some of the behaviors this community engages in regarding individuals with mental illness?

This has been a great conversation so far. Now, each of you will participate in a Virtual Reality simulation. VR is as a computer-generated, fully immersive, three-dimensional experience that can be similar or completely different than a real-world experience. A common way that VR is experienced is in the use of a VR headset (e.g., quest,

oculus) that plays a three-dimensional VR video game (e.g., beat saber, Half-Life: Alyx, Minecraft VR). Tonight, the simulation you will experience is in regard to MHS. When you get a pair of goggles, please read and listen to the initial prompt for instructions on how to proceed. We will be taking turns with the goggles so please refrain from discussing the simulation with individuals who have not seen it yet. The simulation will take about 10 minutes to complete. Up to five people will be able to view the VR simulation at once. Those who do not have goggles will be able to eat the meal provided until a pair becomes available. After the simulation, you will complete a brief post simulation survey and come back to the group for a final discussion about the simulation.

### **Intervention Strategies**

8. VR simulation: Each of you have just participated in a VR simulation. What were your general impressions about the VR simulation?
  - How “real” did the simulation feel? Did you feel like you were in the body of someone with anxiety?
  - Has your view of mental health stigmatizing attitudes, beliefs and behaviors changed? If so, how?
  - What was the most impactful part of the VR simulation in portraying someone who was being stigmatized? In portraying someone with anxiety?
  - What was the most frustrating or confusing part?
  - Could VR be a helpful tool in helping African American young adults understand MHS and stigmatizing events?
  - What would you add or take away to a VR simulation to help explain and decrease MHS?

- Do you feel that this was a memorable experience that will affect how you view MHS?

### **Wrap-up question**

9. If resources were not an issue, what other strategies, tools, or support would be needed in the design of an impactful MHS intervention with African American young adults?

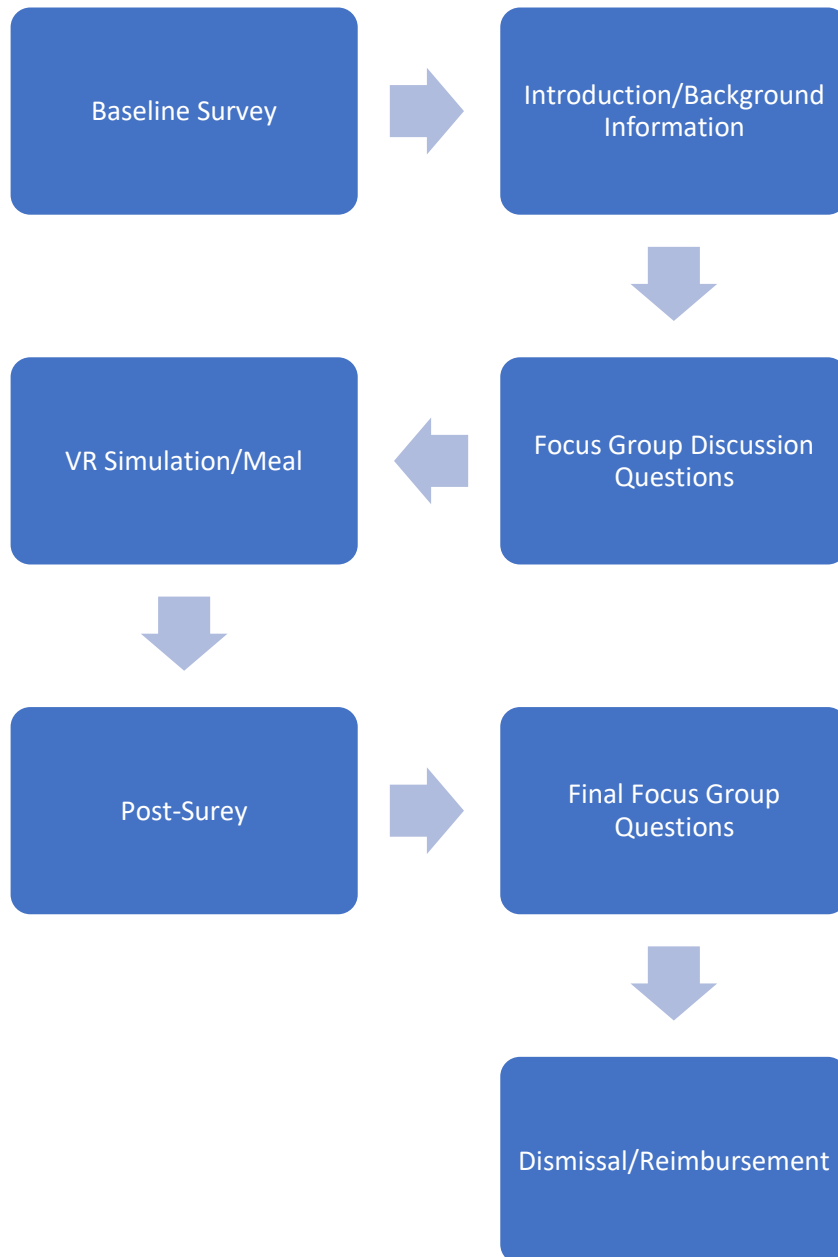
### **Focus Group Closing**

That's all the questions we have for this focus group meeting. Take a moment and think about what's been discussed. Now we'd like to take a few moments to summarize what's been discussed. [Do a brief summary]. Did we miss anything? Does anyone have any questions about what was discussed or how this information will be used?

We really appreciate the time you have taken to help us better understand how to develop and implement community based MHS interventions for young adult African Americans. We hope you were comfortable and felt like you had an opportunity to share your thoughts and opinions. Please feel free to give us feedback on the questions asked, this meeting space and time, or anything else you think we should know. Thanks again!

APPENDIX B

FOCUS GROUP FLOW DIAGRAM



## APPENDIX C

### VR SIMULATION STORIES AND VISUALS

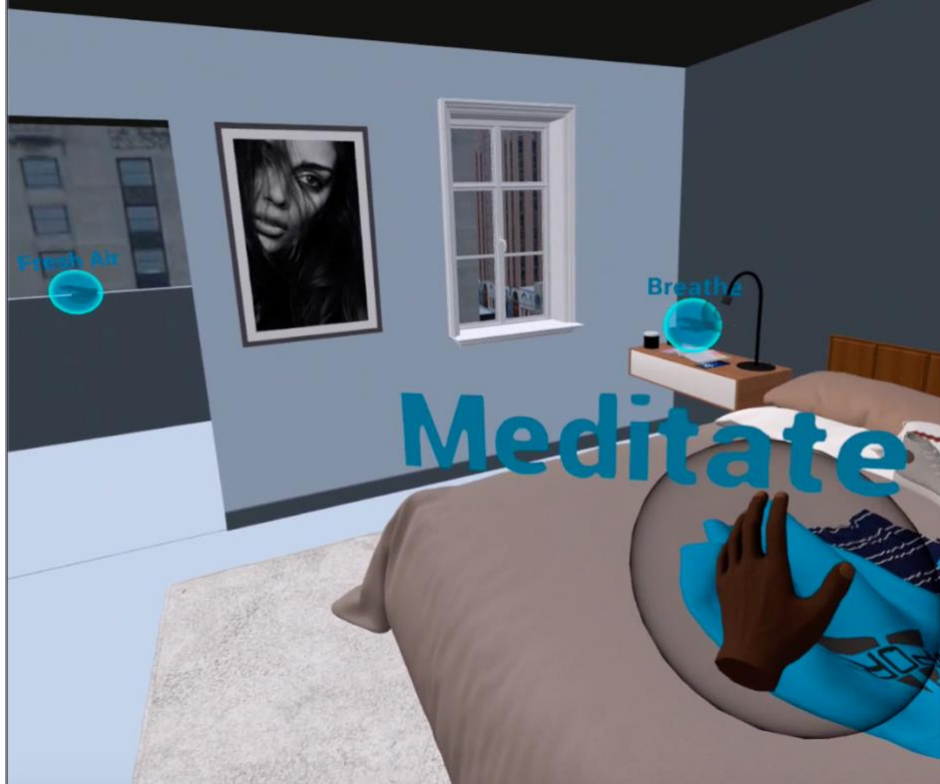
#### **Introduction Story**

You have been concerned about your mental health and recently visited a psychologist. After a few sessions with the psychologist, you were diagnosed with Generalized Anxiety Disorder. Although you were scared about what they might think, you wanted some support and went to a cookout to explain the diagnosis to some friends and family. The responses you received were not supportive. Your friends and family made statements such as “Black people don’t have anxiety”, “Why do you trust these doctors?”, “No you don’t, you just need to pray”, and “I bet the doctor was White”. One even jokingly said, “I can’t be around crazy people”. You thought about this incident all night. It is now the next day, and you have to get ready to go to work. You are still having thoughts about how the cookout went yesterday. After you take some time to explore the room, please get ready to go to work by picking out an outfit and walking out the door.

#### **Conclusion Story**

Although you have successfully picked out an outfit and headed to work, as a result of the conversation you had with family and friends, you called your therapist to cancel all of your future appointments and will not speak to anyone about your personal mental health issues again. You are still diagnosed with Generalized Anxiety Disorder but are no longer receiving support or treatment for this concern which may cause your symptoms to increase in severity.

Please return your goggles.



APPENDIX D

BASELINE SURVEY

**Virtual Reality Mental Health Experience Survey  
(BASELINE)**

Record ID

1. How old are you?

2. What was your gender at birth?

- Male
- Female
- Refuse to answer

3. Do you identify your ethnicity as being of Hispanic or Latino origin?

- No, not of Hispanic or Latino origin
- Yes, Mexican, Puerto Rican, Cuban, or another Hispanic, Latino, or Spanish origin (For example, Argentinian, Columbian, Dominican, Puerto Rican, Nicaraguan, Salvadorian, Spaniard, and so on.)
- Unknown
- Refuse to answer

4. What is your race or ethnicity? (Check one)

- Black or African American
- White or Caucasian
- American Indian or Alaska Native
- Asian
- Native Hawaiian or other Pacific Islander
- More than one race
- Unknown
- Refuse to answer
- Other race (please specify):

Other (please specify):

5. How do you identify yourself? (Check one)

- Heterosexual (straight)
- Homosexual (gay/lesbian)
- Bi-sexual (attracted to both men and women)
- Other
- Refuse to answer

6. What is your highest level of education you have completed? (If you attended school outside the U.S., mark the U. S. equivalent) (Check one)

- 8th grade or below
- 9-11th grade
- High school graduate or GED
- Post high school technical training
- Some college (but no degree)
- Associate's degree/Technical school certificate
- College degree
- Graduate courses
- Graduate degree

7. What is your current marital status? (Check one)

- Single, never married
- Living with partner, but not married
- Main relationship partner, not living with
- Married
- Separated
- Divorced
- Widowed

8. Do you have health insurance or coverage that helps pay for part of your medical bills? (Check all that apply)

- No, I do not have health insurance
- Yes, Medicare
- Yes, Medicaid
- Yes, Private Insurance (Such as Blue Cross/ Blue Shield, Kaiser, etc.)
- Yes, Some other insurance (please list):

Yes, Some other insurance (please list): \_\_\_\_\_

9. For the past 12 months, please estimate the average monthly income of your household. Take into account all the sources of income from the members of your household. (Check One)

- \$0 - \$1,000
- \$1,001 - \$2,000
- \$2,001 - \$2,500
- \$2,501 - \$3,000
- More than \$3,000
- Don't know

**10. For the past 12 months, how often have you done each of the following activities? (Mark one for each activity)**

	Never	Rarely	Once a month	Twice a month	Once a week	Twice a week	Almost daily	More than once a day
a. Thought of God	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Prayed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Meditated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Attended a worship service	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Read scriptures or holy writings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Had direct experiences with God	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**11. The following questions are specifically about religious or spiritual ways you might cope with mental health concerns. Indicate how much you use each of the following methods to cope with mood or mental health concerns. When the items refer to God, please think of this as referring to your Higher Power.**

	Not at all	A little	A medium amount	A great deal
a. I don't do much; just expect God to solve my problems for me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. I work together with God as partners.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. I try to put my plans into action together with God.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. I try to make sense of the situation with God.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. I try to deal with my feelings without God's help.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- f. I don't try much of anything; simply expect God to take control.
- g. I make decisions about what to do without God's help.
- h. I don't try to cope; only expect God to take my worries away.
- i. I try to make sense of the situation without relying on God.

12. In your opinion, how serious is mental health in your community? (Check one)

Not at all serious  
 Not too serious  
 Somewhat serious  
 Very serious

13. In the last 12 months, how many people did you talk to about any topics related to mental health? (Check one)

None  
 1-2 people  
 3-5 people  
 6-9 people  
 10-19 people  
 20 or more people

14. Have you ever been screened for mental health concerns? (Check one)

No  
 Yes  
 Don't know/Not sure

15. Have been screened for mental health concerns in the last 12 months? (Check one)

No  
 Yes  
 Don't know/Not sure

**16. How likely would the following people support you in getting screened for mental health concerns? (Circle one number for each statement below. Mark circle under "Don't Know" if you don't know.)**

	0 Not at all likely	1	2	3	4	5	6 Very likely	Don't know
a. My friends would support me in getting a mental health screening.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. My partner/spouse would support my getting a mental health screening.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. My church members would support my getting a mental health screening.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. My pastor would support my getting a mental health screening.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

e. My doctor would support my getting a mental health screening.

**17. Please indicate if you have been screened for any of the following mental health conditions in the last 12 months. (Mark one circle for each mental health condition below)**

	No	Yes	Don't know/Not sure
a. Depression	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Anxiety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Post-traumatic stress disorder (PTSD)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Substance use disorders (like alcohol, methamphetamines, oxytocin, heroin)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**18. Please indicate if you have EVER (in your lifetime) been screened for any of the following mental health conditions. (Mark one circle for each mental health condition below)**

	No	Yes	Don't know/Not sure
a. Depression	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Anxiety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Post-traumatic stress disorder (PTSD)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Substance use disorders (like alcohol, methamphetamines, oxytocin, heroin)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**19. Please indicate if you have been diagnosed with any of the following mental health conditions in the last 12 months. (Mark one circle for each mental health condition below)**

	No	Yes	Don't know/Not sure
a. Depression	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Anxiety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Post-traumatic stress disorder (PTSD)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Substance use disorder (like alcohol, methamphetamines, oxytocin, heroin)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**20. Please indicate if you have EVER (in your lifetime) been diagnosed with any of the following mental health conditions. (Mark one circle for each mental health condition below)**

	No	Yes	Don't know/Not sure
a. Depression	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- b. Anxiety
- c. Post-traumatic stress disorder (PTSD)
- d. Substance use disorder (like alcohol, methamphetamines, oxytocin, heroin)

**21. To what extent do you believe the following statements? (Circle one number for each statement below)**

	0 Not at all	1	2	3	4	5	6 Very much so
a. I can receive mental health screening at my church.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. I can receive mental health screening at a local clinic/doctor's office.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. The cost of a mental health screening a clinic or doctor's office is affordable or free.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. If I received a mental health screening at church, my results would be kept confidential.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. If others thought I had a mental health condition, I could be treated differently or badly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. If I found out I had a mental health condition, I could get connected to resources (e.g., counseling) or receive medications for treatment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**22. Please mark the response that best represents your answer to each of the following questions. (Mark one circle only for each statement)**

	Strongly disagree	Somewhat disagree	Uncertain	Somewhat agree	Strongly agree
a. I believe a person with mental illness is a danger to others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. I believe a person with mental illness is unpredictable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. I believe a person with mental illness has only himself/herself to blame for his/her condition.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- |   |                       |                       |                       |                       |                       |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| d. I believe a person with mental illness would improve if given treatment or support.          | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| e. I believe a person with mental illness feels the way we all do at times.                     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| f. I believe a person with mental illness could pull himself/herself together if he/she wanted. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| g. I believe a person with mental illness can eventually recover.                               | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| h. I believe a person with mental illness can be as successful at work as others.               | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| i. I believe treatment can help people with mental illness lead normal lives.                   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| j. I believe people are generally caring and sympathetic to people with mental illness.         | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

**23. Please mark the response that best represents your answer on how strongly you agree or disagree with each statement. (Mark one circle only for each statement)**

- |   | Strongly disagree     | Somewhat disagree     | Uncertain             | Somewhat agree        | Strongly agree        |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| a. People with mental health conditions are responsible for having their illness          | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. Scientists and doctors can be trusted to tell the truth about mental health conditions | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

**24. Please mark the response that best represents your answer on how strongly you agree or disagree with each statement. (Mark one circle only for each statement)**

- |   | Strongly disagree     | Disagree              | Agree                 | Strongly agree        |
|---|-----------------------|-----------------------|-----------------------|-----------------------|
| a. You'd better be cautious when dealing with health care organizations         | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. Patients have sometimes been deceived or misled by health care organizations | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

- |  |                       |                       |                       |                       |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| c. When health care organization make mistakes they usually cover it up                                  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| d. Health care organizations have sometimes done harmful experiments on patients without their knowledge | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| e. Health care organizations don't always keep your information totally private                          | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| f. Sometimes I wonder if health care organizations really know what they are doing                       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| g. Mistakes are common in health care organizations  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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25. Have you ever visited a mental health professional, such as a therapist, counselor, or psychologist? (Check One)

No  
 Yes  
 Don't know/Not sure  
 Refuse to answer

**26. Using the scale provided, rate each of the possible concerns that might affect your decision to seek treatment for a psychological problem (e.g., stress or emotional problem such as depression or anxiety attacks) from a mental health professional (e.g., psychologist or counselor) (Mark one circle only for each statement)**

- |   | Strongly disagree     | Somewhat disagree     | Uncertain             | Somewhat agree        | Strongly agree        |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| a. I don't know where to get help   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. I don't have adequate transportation   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c. It is difficult to schedule an appointment                                       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| d. There would be difficulty getting time off work or school for treatment          | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| f. Getting treatment costs too much money   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| g. I can't find an African American mental health professional                      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| h. I don't believe that the mental health professional would understand my concerns | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

**27. Over the last 2 weeks, how often have you been bothered by the following problems?****(Mark one circle only for each statement)**

	Not at all	Several days	Over half the days	Nearly everyday
a. Feeling nervous, anxious, or on edge.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Not being able to stop or control worrying.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Worrying too much about different things.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Trouble relaxing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Being so restless that it is hard to sit still.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Being easily annoyed or irritable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. Feeling afraid as if something awful might happen.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

27h. If you checked off any problems, how difficult have these made it for you to do your work, take care of things at home, or get along with other people? (Check one)

Not at all difficult    Somewhat difficult    Very difficult    Extremely difficult    N/A

**28. Over the last two weeks, how often have you been bothered by any of the following problems? (Mark one circle only for each statement)**

	Not at all	Several days	Over half the days	Nearly everyday
a. Little interest or pleasure in doing things.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Feeling down, depressed, or hopeless.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Trouble falling or staying asleep, or sleeping too much.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Feeling tired or having little energy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Poor appetite or overeating.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Feeling bad about yourself - or that you are a failure or have let yourself or your family down.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. Trouble concentrating on things, such as reading the newspaper or watching television.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

h. Moving or speaking so slowly that other people could have noticed. Or the opposite - being so fidgety or restless that you have been moving around a lot more than usual.

i. Thoughts that you would be better off dead, or of hurting yourself in some way.

28j. If you checked off any problem on this questionnaire, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people? (Check one)

Not at all difficult  Somewhat difficult  Very difficult  Extremely difficult  N/A

**29. The following questions will ask you about your feelings and thoughts over the last 7 days. In each case, you will be asked to indicate how often you felt a certain way. Some of the questions may sound similar, but please treat each question separately. Try to answer each question fairly quickly - do not try to count up the number of times you felt a particular way, but rather provide your best guess. (Mark one circle only for each statement)**

	Never	Almost never	Sometimes	Fairly often	Very often
a. Been upset because of something that happened unexpectedly?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Felt that you were unable to control the important things in your life?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Felt nervous or "stressed"?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Dealt successfully with irritating life hassles.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Felt that you were effectively coping with important changes that were occurring in your life?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Felt confident about your ability to handle your personal problems?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. Felt that things were going your way?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. Found that you could not cope with all the things that you had to do?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. Been able to control irritations in your life?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- j. Felt that you were on top of things?
- k. Been angered because of things that happened that were outside of your control?
- l. Found yourself thinking about things that you have to accomplish?
- m. Been able to control the way you spend your time?
- n. Felt that difficulties were piling up so high that you could not overcome them?

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30. Have you experienced discrimination because of your race or skin color during a healthcare visit in the past year? (Check one)

- Yes  No

---

31. Have you experienced discrimination because of your race or skin color at work in the past year? (Check one)

- Yes  No

---

32. Have you experienced discrimination because of your race or skin color in social or community settings (like the store, restaurant, bank, transportation services) in the past year? (Check one)

- Yes  No

---

33a. Have you ever experienced Virtual Reality (VR) before (like through a VR headset or computer)? (Check one)

- Yes  No

---

33b. If Yes, how many times? (Check one)

- 1-2 times  3-5 times  6-9 times  10 or more times

---

33c. If No, why not? (Check one)

- I don't have access to virtual reality equipment
- I don't know where I could experience virtual reality in the community
- I don't play video games
- I'm not interested in virtual reality
- I'm afraid of potential side effects (like dizziness or nausea)
- Unsure

APPENDIX E

POST SURVEY

**Virtual Reality Mental Health Experience Survey (POST)**

Record ID \_\_\_\_\_

1. In your opinion, how serious is mental health in your community? (Check one)

- Not at all serious
- Not too serious
- Somewhat serious
- Very serious

**2. How likely would the following people support you in getting screened for mental health concerns? (Circle one number for each statement below. Mark circle under "Don't Know" if you don't know.)**

	0 Not at all likely	1	2	3	4	5	6 Very likely	Don't know
a. My friends would support me in getting a mental health screening.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. My partner/spouse would support my getting a mental health screening.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. My church members would support my getting a mental health screening.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. My pastor would support my getting a mental health screening.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. My doctor would support my getting a mental health screening.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**3. To what extent do you believe the following statements? (Circle one number for each statement below)**

	0 Not at all	1	2	3	4	5	6 Very much so
a. I can receive mental health screening at my church.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. I can receive mental health screening at a local clinic/doctor's office.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. The cost of a mental health screening a clinic or doctor's office is affordable or free.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- d. If I received a mental health screening at church, my results would be kept confidential.
- e. If others thought I had a mental health condition, I could be treated differently or badly.
- f. If I found out I had a mental health condition, I could get connected to resources (e.g., counseling) or receive medications for treatment.

**4. Please mark the response that best represents your answer to each of the following questions. (Mark one circle only for each statement)**

	Strongly disagree	Somewhat disagree	Uncertain	Somewhat agree	Strongly agree
a. I believe a person with mental illness is a danger to others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. I believe a person with mental illness is unpredictable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. I believe a person with mental illness has only himself/herself to blame for his/her condition.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. I believe a person with mental illness would improve if given treatment or support.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. I believe a person with mental illness feels the way we all do at times.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. I believe a person with mental illness could pull himself/herself together if he/she wanted.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. I believe a person with mental illness can eventually recover.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. I believe a person with mental illness can be as successful at work as others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. I believe treatment can help people with mental illness lead normal lives.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. I believe people are generally caring and sympathetic to people with mental illness.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**5. Please mark the response that best represents your answer on how strongly you agree or disagree with each statement. (Mark one circle only for each statement)**

	Strongly disagree	Somewhat disagree	Uncertain	Somewhat agree	Strongly agree
a. People with mental health conditions are responsible for having their illness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Scientists and doctors can be trusted to tell the truth about mental health conditions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**6. Please mark the response that best represents your answer on how strongly you agree or disagree with each statement. (Mark one circle only for each statement)**

	Strongly disagree	Disagree	Agree	Strongly agree
a. You'd better be cautious when dealing with health care organizations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Patients have sometimes been deceived or misled by health care organizations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. When health care organization make mistakes they usually cover it up	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Health care organizations have sometimes done harmful experiments on patients without their knowledge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Health care organizations don't always keep your information totally private	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Sometimes I wonder if health care organizations really know what they are doing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. Mistakes are common in health care organizations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**7. Using the scale provided, rate each of the possible concerns that might affect your decision to seek treatment for a psychological problem (e.g., stress or emotional problem such as depression or anxiety attacks) from a mental health professional (e.g., psychologist or counselor) (Mark one circle only for each statement)**

	Strongly disagree	Somewhat disagree	Uncertain	Somewhat agree	Strongly agree
a. I don't know where to get help	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

b. I don't have adequate transportation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. It is difficult to schedule an appointment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. There would be difficulty getting time off work or school for treatment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Getting treatment costs too much money	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. I can't find an African American mental health professional	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. I don't believe that the mental health professional would understand my concerns	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**8. Please mark the response that best represents your answer on how strongly you agree or disagree with each statement regarding your engagement in the Virtual Reality experience. (Mark one circle only for each statement)**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
a. I could picture myself in the scene of the events described in the story	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. I was mentally involved in the narrative while reading it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. I wanted to learn how the narrative ended	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. The narrative affected me emotionally	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. While reading the narrative, I had a vivid image of the character	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**9. Please mark the response that best represents your answer on how strongly you agree or disagree with each statement regarding your engagement in the Virtual Reality experience. (Mark one circle only for each statement)**

	Strongly disagree	Somewhat disagree	Uncertain	Somewhat agree	Strongly agree
a. I felt as if I was looking at my own hands	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. I felt like I could control the character	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- c. I found it difficult to get into the role of the character
- d. I felt as if I was an outsider to the story
- e. While moving the clothes in the experience, I felt it was me picking out an outfit
- f. When the heart rate meter appeared, I felt it was displaying my heart rate

10. During the Virtual Reality experience, which helping hand did you think was the most helpful in lowering your heart rate? (Check one)

- Fresh Air  
 Deep Breath  
 Meditation  
 Prayer  
 None

11. How satisfied were you with the Virtual Reality experience? (Check one)

- Not at all satisfied  
 Dissatisfied  
 Uncertain/neutral  
 Satisfied  
 Very satisfied

12. How satisfied were you with the focus group discussion? (Check one)

- Not at all satisfied  
 Dissatisfied  
 Uncertain/neutral  
 Satisfied  
 Very satisfied

13. The amount of information provided during the focus group about mental health stigma was: (Check one)

- Good amount  
 Not enough  
 Too much

**14. The following questions are to better understand your feelings about mental health stigma after this experience. Some of the questions are quite similar but do your best to respond to each one as a separate question. (Check one number for each statement below.)**

- |   | 0 Not at all          | 1                     | 2                     | 3                     | 4                     | 5                     | 6 Very much so        |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| a. If needed, I want (or would like) to see a mental health professional.           | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. If needed, I am ready to seek professional mental health care.                   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c. If needed, I intend to encourage others to seek professional mental health care. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

- j. Felt that you were on top of things?
- k. Been angered because of things that happened that were outside of your control?
- l. Found yourself thinking about things that you have to accomplish?
- m. Been able to control the way you spend your time?
- n. Felt that difficulties were piling up so high that you could not overcome them?

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30. Have you experienced discrimination because of your race or skin color during a healthcare visit in the past year? (Check one)

- Yes  No

---

31. Have you experienced discrimination because of your race or skin color at work in the past year? (Check one)

- Yes  No

---

32. Have you experienced discrimination because of your race or skin color in social or community settings (like the store, restaurant, bank, transportation services) in the past year? (Check one)

- Yes  No

---

33a. Have you ever experienced Virtual Reality (VR) before (like through a VR headset or computer)? (Check one)

- Yes  No

---

33b. If Yes, how many times? (Check one)

- 1-2 times  3-5 times  6-9 times  10 or more times

---

33c. If No, why not? (Check one)

- I don't have access to virtual reality equipment  
 I don't know where I could experience virtual reality in the community  
 I don't play video games  
 I'm not interested in virtual reality  
 I'm afraid of potential side effects (like dizziness or nausea)  
 Unsure

d. I am committed to changing the way I treat others with mental health concerns.

e. I believe virtual reality (VR) should be used to address mental health stigma and other mental health topics.

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## VITA

Tacia Burgin was born October 13, 1996, in Kansas City, Missouri. She holds her Bachelor of General Studies in Psychology from the University of Kansas in Lawrence, Kansas, where she graduated in 2019. She holds her Master of Arts in Psychology from the University of Missouri-Kansas City in 2022. Tacia began pursuing her PhD in Clinical Psychology at the University of Missouri – Kansas City in August 2019 and is on track to graduate with her degree in July 2024.