Mental Health Challenges and Barriers to Telemedicine for Postpartum Women of Color During COVID-19: Examining the Role of Communication Technology

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Abstract

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This research examines mental health in postpartum women of color (WOC) during COVID-19 including risk for development of postpartum depression (PPD). Barriers and challenges to PPD treatment via telemedicine are also assessed using the Technology Acceptance Model (TAM) as a guiding framework. During the summer of 2020, 135 participants identifying as WOC in the postpartum period completed an online survey. Survey measures administered include the Edinburgh Postnatal Depression Scale (EPDS); the eHealth Literacy (eHEALS) scale; and items assessing preference for in-person vs. digital psychotherapy. Open-ended questions were used to further assess mental health challenges and opinions of virtual therapy. The average reported EPDS score was 11.4; a score >9 is indicative of PPD. However, only 26% of participants reported receiving mental health services. Of this 26%, only 11% used telemedicine for virtual therapy. Factors reported by participants as negatively impacting their mental health during COVID-19 include social support challenges, increased domestic duties, financial challenges, and health-related concerns. Participants reported high confidence in using technology to access

health information; the average eHEALS score was 32.5. Reported connectivity was also high, with 98.5% owning a smartphone and 86% having access to Wi-Fi. A majority (84%) of participants were open to therapy while 76% were open to virtual therapy. Barriers to virtual therapy include cost, time, and trust. While reporting the technology, digital health literacy, and openness to participating in virtual therapy, few postpartum WOC have spoken to a mental health professional; even fewer have done so virtually. More work is needed to make virtual therapy more accessible.

Introduction

The COVID-19 pandemic has permeated nearly every aspect of our lives and well-being. Shelter in place orders moved everyday tasks such as work, school, and childcare to the homefront. Adverse mental health due to social isolation, fear, and uncertainty caused by the pandemic is now widely documented (Ognyanova et al., 2020; APA; 2020; Bueno-Notivol et al., 2021). Millions of businesses deemed nonessential were unexpectedly closed, which resulted in financial challenges born out of what has been deemed the "coronavirus recession" (Petterson et al., 2020). In April 2020, shortly after the onset of the pandemic, over 16 million Americans filed for unemployment with a total unemployment rate of 14.7% (Bureau of Labor Statistics, June, 2020).

The devastating impacts of the pandemic are widespread, resulting in what has been called a mental health crisis (Choi, 2020). Due to requirements of physical distancing, the health care needed to address this mental health crisis must now be delivered through telemedicine services, defined as the use of communication technologies to deliver clinical healthcare across distance (Matusitz and Breen, 2007). Mental health care through telemedicine, often taking the form of virtual therapy via phone or video chat between a patient and health provider, is a communicative act essential to mental health.

Use of telemedicine has been investigated in studies of health communication and communication technology (Matusitz & Breen, 2007; Whitten & Sypher, 2006), however these investigations have yet to focus on one particularly vulnerable population: women of color in the postpartum period, defined as up to 12 months after giving birth. Previous research has established women of color are at an increased risk of developing postpartum depression (PPD; Salm Ward et al., 2017; Kozhimannil et al., 2011; Scholle et al., 2003) with prevalence rates of

38% compared to 12% for white women (Centers for Disease Control and Prevention [CDC], 2008).

The ongoing COVID-19 pandemic has exasperated adverse maternal mental health for perinatal women. Recent studies have found increased reports of maternal depression and anxiety amongst pregnant and postpartum women in the U.S., Canada, China, Turkey, Italy, and Greece (Hessami et al., 2020; Chen et al., 2021; Cameron et al., 2020; Davenport et al., 2020). While these studies have answered an urgent call to assess the effect of the pandemic on maternal mental health, questions of pre-existing health disparities cannot be ignored. Hessami and colleagues (2020) call for nuanced findings of maternal mental health during COVID-19 which account for historically marginalized identities such as race and socioeconomic status. Generalizations of the current state of mental health fail to account for racialized health disparities and social determinants of health postpartum women of color face.

The current state of maternal mental health and continued requirements of social distancing bring into question how to make telemedicine, and specifically virtual therapy, more accessible and appealing to postpartum women of color. Past studies on remote PPD interventions have thus far been conducted with predominantly white participants (Keefe et al., 2016; 2018; Barrera et al., 2015). For studies that have focused on telemedicine usage in women of color (Le et al., 2011; Baker-Ericzén et al., 2012; Mukherjee et al., 2018), the specific modality of virtual therapy and the contextual influences of the pandemic have yet to be investigated. A focus on virtual therapy is warranted given the established effectiveness of cognitive behavioral therapy and interpersonal psychotherapy as treatments for minoritized women suffering from PPD (Grote et al., 2015; Muñoz et al., 2007).

This study uses survey methodology to understand the mental health challenges faced by postpartum women of color[1] during the COVID-19 pandemic. Guided by the Technology Acceptance Model (TAM), this work examines the supportive role of communication technology and identifies enablers and inhibitors of telemedicine adoption. Given the potential of telemedicine to increase access to healthcare (Matusitz & Breen, 2007), the findings of this study will inform human-centered design projects which aim to make virtual therapy more appealing and accessible for postpartum women of color.

Literature Review

This literature review examines PPD-related health disparities and risk factors for women of color, including new findings of PPD during the COVID-19 pandemic. A review of PPD scholarship is then followed with a discussion of telemedicine to situate the current study. Opportunities and challenges of telemedicine are discussed, connecting specifically to the field health communication. Connecting scholarship on PPD and telemedicine with health communication moves conversations of PPD beyond symptomatology to opportunities for treatment using communication technologies.

Postpartum Depression: Risk Factors, Health Disparities, and COVID-19

Postpartum depression (PPD) is a widely studied maternal mental health disorder, yet a majority of PPD research has focused on the experiences and symptoms of white women, with treatments largely created for this specific population (Keefe et al., 2016; 2018). According to the Diagnostic and Statistical Manual of Mental Disorders, symptoms of PPD include anxiety, hopelessness, suicidal thoughts, decreased energy, disturbed sleep, and social withdrawal

[1] Women of color in this study include participants identifying as either Black or African American, Hispanic or Latino/x, Asian or Pacific Islander, as well those who identified as "Other" and were given the option to write-in their specific ethnic identity. The researcher recognizes these ethnic group categorizations are not all-inclusive to the many ethnic identities women of color may hold.

(American Psychiatric Association, 2013). PPD is a cause of great concern, holding implications for the health of both mother and child (Ko et al., 2017). Previous research has found the occurrence of PPD to have adverse effects on the emotional and cognitive development of infants (Field, 2010; Sohr-Preston, 2006) and many mothers suffering from PPD report feeling guilt about their adverse mental health, ultimately impacting their ability to care for their newborn (Mauthner, 1999).

Risk factors for development of PPD are multifaceted and include lack of social support, stressful life events, financial challenges, socioeconomic status, and social and cultural norms surrounding motherhood. Social support is one of the most widely studied PPD risk factors (Albuja et al., 2017). Despite the overwhelming amount of literature, systematic reviews have concluded there is no single agreed upon definition of social support (Stana & Miller, 2019). Stana and Miller (2019) argue social support, at its most basic core, is an act of communication. Individuals and networks provide tangible support, resources, validation, acceptance, and reassurance to one another in managing life's various circumstances (Albrecht & Goldsmith, 2003; Stana & Miller, 2019). Previous research has found social support to be a protective factor against PPD both during and after pregnancy (Salm Ward et al., 2017; Albuja et al., 2017). Such findings have been extended to the current pandemic. Recent studies have found social support to be associated with lower levels of stress, anxiety, and depression in perinatal women (Farewell et al., 2020; Barbosa-Leiker et al., 2021).

In addition to lack of social support, past research has established stressful life events (SLEs) both during and after pregnancy increase new mothers' chances of developing PPD (Stone et al., 2015; Qobadi et al., 2016). Living during a pandemic is a SLE for many reasons. Recent studies have found pandemic-related stressors include fear of contracting COVID-19,

meeting basic needs, accessing healthcare, and job distress for frontline and essential workers (APA, 2020; Fitzpatrick, 2020; Said, 2021). A recent report by the American Psychological Association (APA; 2020) found these stressors were higher in people of color. SLEs and lack of social support are further compounded as PPD risks by other social factors including socioeconomic status (SES) and social and cultural norms surrounding motherhood (Abrams et al., 2009; Callister et al., 2011; Kozhimannil et al., 2011). SES and cultural norms are more prominent for women of color who experience much higher rates of SLEs and PPD compared to their white counterparts (Salm Ward et al., 2017; Kozhimannil et al., 2011; Scholle et al., 2003; CDC, 2008).

Looking at larger societal discourses, the belief of good and intensive mothering negatively affects women of color (Elliott et al., 2015). Intensive mothering poses expectations on mothers that they must enjoy motherhood, be the primary caretaker of their children, and invest great amounts of energy and emotional labor into caring for their children. These expectations are more easily attained by mothers who have adequate financial and social resources, ultimately leaving women of color to be viewed as bad mothers by society's middle-class standards (Ladd-Taylor & Umansky, 1998). Previous research has found that mothers who seek to fulfill these traditional gender roles, and perceive themselves as failing to do so, are at risk of developing PPD - for women lacking social support, this risk is even higher (Albuja et al., 2017).

While no studies have yet to focus on maternal mental health during COVID-19 specifically for postpartum women of color, recent studies have found disparities of mental health and access to care amongst perinatal women when controlling for demographic variables. In one study of perinatal women in the U.S., Barbosa-Leiker and colleagues (2021) found

women of color in their sample were more likely to experience greater stress, financial challenges, and less social support compared to white participants and participants from a higher SES. Across the entire sample, issues with access to childcare, healthcare, and purchasing baby supplies were also documented (Barbosa-Leiker et al., 2021).

In another study of perinatal mental health during the pandemic, Masters et al. (2021) also found disparities in mental health for participants in their sample identifying as women of color, who reported greater increases in depression and anxiety and less access to mental health care compared to white participants. While such findings provide evidence for health disparities, it is important to note the perinatal period includes women who are currently pregnant as well as postpartum. Focusing specifically on the postpartum period, the experiences of women of color, and risk factors for PPD therefore leads to the first research question:

RQ1: What mental health challenges are postpartum women of color experiencing during the COVID-19 pandemic?

Health Communication Research on PPD

PPD is a phenomenon which has received little attention in health communication research apart from studies on patient-provider communication. In one study of provider communication, Mukherjee et al. (2016) found positive patient-provider communication was related to lower rates of PPD symptomatology in a diverse group of over 87,000 women in the U.S. (Mukherjee et al., 2016). However, across racial and ethnic groups, this finding was only supported among white women. While this study provides insight into how communication practices play a role in PPD, there are still considerable gaps in studies on PPD within health communication literature specifically. In the few studies on PPD conducted within the field of

health communication, social support is also prevalent, likely overlapping with social support as theorized in the field of interpersonal communication (Bodie & MacGeorge, 2015).

Investigating social support for PPD in online support groups, Stana and Miller (2019) take a critical approach to argue that culture and norms surrounding motherhood drive new moms to seek anonymized social support online. In their study, the social support received within the online group was related to positive mental health outcomes. These findings have been supported in other studies of online support groups for PPD conducted outside of the realm of health communication (Moore & Ayers, 2017). With scant literature on PPD in health communication, opportunities exist for in-depth investigations into the unique challenges faced by postpartum women of color and interventions to address adverse maternal mental health through telemedicine and, more specifically, virtual therapy.

Opportunities and Challenges of Telemedicine

Telemedicine is broadly defined as "the use of advanced communication technologies, within the context of clinical health, that deliver care across distance" (Matusitz & Breen, 2007, pp. 73-74). Technologies included in this definition range from telephone and video conferencing to mobile phone health applications and Internet-based services providing health information (e.g., WebMD). For the present study, telemedicine focuses on one-on-one synchronous therapy sessions provided through distanced and/or virtual platforms such as phone calls and video conferencing. This is an intentional focus as past research has established cognitive-behavioral therapy and interpersonal psychotherapy are effective treatment strategies for minoritized women suffering from PPD (Grote et al., 2015; Muñoz et al., 2007).

Other telemedicine applications more widely studied for PPD are self-directed online modules which seek to educate new moms about their adverse mental health and provide tips for

caring for themselves and their children. Clinical trials of such applications suffer from high attrition and low engagement and a majority have failed to produce statistically significant results for successful PPD treatment (Le et al., 2011; Barrera et al., 2015; Nair et al., 2018). In various studies seeking feedback on these courses, women reported wanting more personalized treatment plans and increased one-on-one contact with a mental healthcare provider (Baker-Ericzén et al., 2012; Pugh et al., 2015; O'Mahen et al., 2015). Such findings support the need for telemedicine through virtual and distanced synchronous therapy options.

According to Matusitz and Breen (2007), there are five main benefits of telemedicine: (1) transcending geographical boundaries; (2) transcending temporal boundaries; (3) reducing costs; (4) increasing patient comfort, security, and satisfaction; and (5) digitizing health communication via Web-based services (p. 76). Such benefits are especially useful to people from marginalized groups who may otherwise lack access or resources to partake in healthcare services (Crowe, 1998). For women of color suffering from PPD, treatment becomes more accessible through virtual/distanced therapy where barriers such as lack of childcare or transportation to in-person appointments no longer affect access to treatment. Participating in remote therapy sessions from home or other safe spaces may also help women of color feel comfortable as they defy the cultural beliefs and stigmas which may have influenced their PPD symptomatology in the first place (Baker-Ericzén et al., 2012; Albuja et al., 2017).

While telemedicine delivered through remote therapy has many benefits, critiques of telemedicine have also been raised. Within the field of health communication, Matusitz and Breen (2007) identify four challenges of telemedicine: (1) licensing and legal issues, (2) challenges to patient privacy, (3) resistance from health insurance companies, and (4) limited knowledge and expertise in telemedicine (p. 78). Many of these critiques, however, are less

relevant since the onslaught of the COVID-19 pandemic and social distancing requirements. Many insurance companies have expanded their telemedicine services, including services to address mental and behavioral health (America's Health Insurance Plans [AHIP], 2020). This includes therapy provided by a licensed mental health provider to patients residing in different states, an opportunity ordinarily not permitted by several states' laws (Federation of State Medical Boards [FSMB], 2020). This information is only relevant to those who have health insurance, however. According to the National Institutes of Health (2014), 56% of the 23 million women lacking health insurance are women of color.

Urgent calls to make telemedicine more accessible, including for postpartum women of color, are prominent during the COVID-19 pandemic (Gonzalez et al., 2021; Masters et al., 2021; Barbosa-Leiker et al., 2021). Pre-pandemic, communication scholars have called for interdisciplinary approaches to create telemedicine that is efficient, effective, and delivers high quality health care (Whitten & Sypher, 2006). Such calls will require in-depth understanding of barriers to telemedicine usage as well as factors influencing decisions to adopt this technology. The unique needs and social contexts of postpartum women of color must be accounted for in investigations of telemedicine. The second research question, which will be investigated through the Technology Acceptance Model (TAM), therefore asks:

> RQ2: What barriers and challenges do postpartum women of color face in using communication technologies for telemedicine in the form of virtual therapy?

Technology Acceptance Model (TAM) for Telemedicine

The Technology Acceptance Model (TAM) is used to assess an individual's acceptance of, and intention to use a new technology. Developed by Davis (1989), TAM stems from the Theory of Reasoned Action (TRA) which posits behavior is influenced by an individual's

behavioral intentions, along with the social norms and attitudes surrounding the behavior in question (Madden et al., 1992). Because behavior cannot be directly observed, behavioral intention is used to predict actual behavior. Guided by these principles, TAM seeks to understand behavioral intentions of new technology usage. The two main components of TAM are 1) perceived ease of use (PEOU), or extent to which the user believes using the new technology will require minimal effort, and 2) perceived usefulness (PU), defined as belief of the user that the new technology will be helpful in their life (Kamal et al., 2020). Many studies utilize an extended or revised version of TAM to account for various social contexts surrounding the technology in question.

TAM has been applied in studies assessing intention to use health-related technologies such as mHealth for patients and best practice alerts for providers (Deng et al., 2018; Chen et al., 2019). More recently, TAM has also been used to assess patients' intention to use telemedicine (Kamal et al., 2020; Ramírez-Correa et al., 2020). One study by Kamal and colleagues (2020) used an extended version of TAM to investigate willingness to adopt telemedicine in a group of 275 patients living in a rural area in Pakistan. Kamal and colleagues (2020) argue in addition to PEOU and PU, more variables are needed as intentions to use telemedicine "are dependent on multiple social and behavioral factors" (p. 3). They therefore propose a variation of TAM with two overarching foci: enablers and inhibitors of technology adoption. While the basic TAM does not account for inhibitors, the authors argue for the importance of studying resistance to adopting new technologies, especially technologies such as telemedicine which can vary significantly from infrastructures of traditional face-to-face healthcare.

The following enablers of telemedicine adoption were added to TAM: 1) social influence, 2) trust, and 3) facilitating conditions (p. 3). According to the authors, social influence is the

individual's perception regarding the beliefs of friends, family, or other individuals on whether they should adopt a new technology. Trust is the individual's belief they can rely on the telemedicine services provided through the new technology they are adopting. Facilitating conditions refers to the infrastructures which make telemedicine possible, which include organizational infrastructures of healthcare and technological infrastructures required to adopt the technology. Additional enablers of technology adoption were supported in previous literature and critiques of the basic TAM (Kamal et al., 2020).

The following inhibitors of telemedicine adoption were also added to TAM: 1) technological anxiety, 2) perceived risk, 3) resistance to use, and 4) privacy (pp. 3-4). Technological anxiety refers to nervous feelings or concerns individuals may have when deciding to use a new technology. Perceived risk can be applied to many factors, however Kamal et al. (2020) focus on financial, performance, and psychological risk. Resistance to use refers to the user's intentional rejection of adopting the new technology. According to the authors, resistance is an active choice and differs from non-usage, which could result from lack of awareness of the technology. Privacy refers to concerns about personal information being shared outside of the individual's control. These four inhibitors account for potential reasons to resist telemedicine.

The TAM for telemedicine serves as the guiding theoretical framework for the present study, specifically for the second research question which examines barriers and challenges postpartum women of color face in using communication technologies for virtual therapy. One study by Pierce, Perrin, and McDonald (2020) used TAM to investigate telepsychology adoption in a sample of U.S.-based psychologists. The modified version of TAM used for this study, which included attitudes of others as a form of social influence, successfully predicted use of

telepsychology. However, to date, no studies have used TAM looking specifically at intentions for adopting virtual therapy from the patient's perspective.

The inclusion of enablers and inhibitors to telemedicine adoption included in this version of TAM provides evidence for human-centered design (HCD) projects. HCD principles posit technologies must be created *with* and *for* marginalized groups to achieve effectiveness. The Discover, Design, Build and Test model (DDBT) is one approach, often used in creating technology-based psychosocial interventions (See Lyon et al., 2019). The DDBT contains four phases: 1) Discover, 2) Design, 3) Build and 4) Test.

The Discover phase of the DDBT calls for identification of various needs and preferences from potential users of a technology-based psychosocial intervention. This phase also asks users about existing barriers and challenges to implementing the intervention. The Design phase then takes findings from the Discovery phase and generates ideas for designing the intervention. The next phase, Build, implements findings and ideas from the first two phases to create prototypes of the intervention. The prototypes are tested with users who provide feedback. Utilizing user feedback, the phases of Design and Build work in tandem until the prototype is ready for the final phase, Test. In the Test phase, high quality prototypes are created which are pilot tested with a larger number of users before rollout to the general public.

The DDBT can guide future HCD projects of virtual therapy to treat PPD in women of color. The data in the present study are exploratory and provide information for the Discover phase by identifying the mental health needs of postpartum women of color and barriers to using virtual therapy. Understanding what enables as well as inhibits telemedicine adoption through TAM aligns with findings needed for the Discover phase of the DDBT. The revised version of TAM for telemedicine therefore serves as a broad theoretical framework for this study. An

exploratory investigation is warranted to account for the understudied phenomena of virtual therapy use in postpartum women of color and the contextual influences of the pandemic.

Method

Study Design and Procedures

This study used online survey methodology containing fixed and open-ended questions (see Keyton, 2019) to allow for an exploratory investigation of the experiences of postpartum women of color during COVID-19. According to Keyton (2019) open-ended questions are particularly useful in survey methodology when the phenomenon under investigation has received little attention in previous studies, as is the case for the reality of parenting during a global pandemic. Open-ended questions included in the survey did not have a word limit, allowing participants to provide their responses with as much detail as they desired.

Data was collected during the summer of 2020, shortly after the onset of the pandemic, as part of a larger study of PPD and virtual therapy funded by the National Institute of Mental Health (NIMH). The larger study aimed to conduct qualitative interviews and participatory design sessions with Latina women to re-design a virtual postpartum mental health therapy application. After the onslaught of the COVID-19 pandemic, however, in-person interviews and design sessions were no longer possible. The research team adapted their overall focus of the study as we saw an urgent need to understand the current realities and hardships faced by new mothers during the pandemic. To reach a wide array of participants in a timely manner while maintaining shelter in place orders, we opted to create and disseminate an online survey exploring the experiences of, and mental health of postpartum women during the pandemic. Data about preferences and opinions of virtual therapy were also collected to provide baseline data for

future projects towards the original NIMH funded proposal redesigning a virtual therapy application.

The survey was distributed in two parts through the online survey recruitment platform Prolific (www.prolific.co). First, a screening survey was used to collect demographic information and determine participant eligibility. Respondents must have given birth within the past 12 months to be eligible to participate in the study. Those who met eligibility criteria were then invited to take the second survey containing fixed and open-ended questions designed to answer the research questions. A total of 500 participants completed the survey; each was compensated 5 USD for their participation.

Participant Demographics

Of the 500 participants who completed the survey, 135 identified as women of color and were the focus of analyses for this sub-study. A participant was determined to be a woman of color if they identified as at least one, or multiple, of the following racial and ethnic identities: Black or African American, Hispanic or Latino/x, Asian or Pacific Islander, or "Other" with the option to write-in their specific ethnic identity. Examples of "Other" identities participants provided include "Native", "mixed-race", and "Middle Eastern". Within the predetermined categories identified above, participants were prompted to "check all that apply" to account for multiple ethnic identities as well as those who identified as one (or several) of the predetermined categories in addition to identifying as White.

Table 1

Participant Characteristics

Characteristic	Frequency (n)	Percentage
Racial/ethnic identity		

Black or African American	60	44.4%
Hispanic or Latino/x	22	16.3%
Asian or Pacific Islander	25	18.5%
Other	4	2.9%
Multiple Ethnic Identities (e.g. Hispanic or Latino/x and White; Black or African American and Asian or Pacific Islander)	24	17.8%
Age group		
15-19 years	6	4.4%
20-24 years	22	16.3%
25-29 years	39	28.8%
30-34 years	41	30.4%
35-39 years	21	15.5%
40-44 years	5	3.7%
Marital status		
Currently married	99	73.3%
Divorced	2	1.5%
Separated	3	2.2%
Never married	30	22.2%
Education		
Less than high school diploma	1	0.7%
High school diploma or GED	12	8.9%
Some college, but no degree	27	20%
Associates degree	9	6.7%5
Bachelor's degree	52	38.5%
Post-graduate degree	33	24.4%

Employment status		
Employed full time	54	40%
Employed part time	27	20%
Self-employed	8	5.9%
Out of work and seeking opportunities	8	5.9%
Homemaker or stay at home parent	36	26.7%
Unable to work	1	0.7%
Access to childcare		
Yes	58	43.0%
No	76	56.3%
People residing in the home		
Partner or father of child	115	85.2%
Children, related or unrelated	124	91.9%
Relatives, such as adult children, cousins, or in-laws	27	20%
Nonrelatives, such as roommates or live-in babysitters	4	3%
People staying temporarily	3	2.2%
Language spoken at home		
English	96	71.1%
*Other	38	28.1%

**Self-reported languages include Spanish, Chinese, Korean, Tagalog, Hindi, and French*

The average age of participants was 29 years (SD=5.5). Education levels were also assessed as a proxy for socioeconomic status. Overall, the sample was highly educated: 38.5% of participants reported earning a bachelor's degree and 24.4% of participants reported earning a

postgraduate degree; 20% of participants reported attending college but not earning a degree. A majority of the sample (66%) reported being currently employed, however 56.3% reported currently having no access to childcare. 73.3% of participants reported being currently married and 85.2% of participants reported living with their partner or father of their child. Most participants (81.5%) reported having between three and six individuals residing in their household with some participants indicating as many as 10 people currently living in their home. 28.1% of participants reported speaking a language other than English in their homes.

Measures

Edinburgh Postnatal Depression Scale

Mental health outcomes were measured using the Edinburgh Postnatal Depression Scale (EPDS), a 10-item questionnaire which assesses risk for PPD by asking participants to rate how often they are experiencing PPD symptoms (Cox et al., 1987). Example items include, "I have been anxious or worried for no good reason" and "I have been so unhappy that I have had difficulty sleeping". Each item on the EPDS is scored from 0 to 3 with the highest possible score of 30. According to Cox et al. (1987), a score of 9 or higher on the EPDS indicates possible depression.

Internet Usage: From the Health Information National Trends Survey

The Health Information National Trends Survey (HINTS), available through the National Cancer Institute, is a cross-sectional survey designed to measure access to technology and how people use technology for health information. Specific items from Section B of the fifth cycle of HINTS (2019), titled "Using the Internet to Find Information", were used for this study. Example questions from this section of HINTS include, "What device do you use the most when you go online at home?" and "On your tablet or smartphone, do you have any "apps" related to

health and wellness?". These questions allowed for a broad investigation into access to technology and how, if at all, technology use is targeted toward health information seeking and outcomes.

The eHealth Literacy Scale

The eHealth Literacy Scale (eHEALS) was designed to measure comfortability and skill in using technology to access health information. eHEALS measures participants' ability to search for, read, find, and use health information from electronic resources (Norman and Skinner, 2006). Items on the eHEALS ask participants to rate on a 5-point Likert scale how strongly they agree with statements such as, "I know how to find helpful health resources on the Internet" and "I know how to use the health information I find on the Internet to help me.". The highest possible score on eHEALS is 40 and the lowest possible score is 8.

Preferences for In-Person Versus Digital Treatment

A series of questions developed by psychology scholars and a health advisory board (see Renn et al., 2019) were used to assess preferences for in-person versus virtual psychotherapy. Example questions included in this scale are, "Would you be open to consulting a counselor or therapist virtually (for example through video chat or text)?", with a "*yes*" or "*no*" option, and "What would make it challenging for you to talk to a therapist or counselor online?". This measure also contained open-ended questions for participants to provide opinions or hesitations to virtual therapy ("What are some reasons why you would not be open to consulting a counselor or therapist virtually?").

This measure also asks participants about past experiences with therapy. These questions were altered for the current study to account for the postpartum context. For example, one question which asked about past experiences with therapy was changed to state, "Since giving

birth, have you spoken to a counselor, therapist or other mental health professional (like a psychologist or social worker)?" with a "yes" or "no" option. A follow-up question then asked, "Was this in person or virtual (e.g., phone, online)?". This scale is descriptive in nature and allows for exploratory investigations into how often virtual therapy is used and participants' opinions about using this form of telemedicine for mental health care.

Data Analysis

A separate data file was created for women of color participants (n=135). Means and frequencies were conducted for each measure which allowed for descriptions and inferences from the data to be made. Quantitative results are presented along with qualitative findings to provide an exploratory understanding of the current state of mental health for postpartum women of color during the COVID-19 pandemic as well as barriers, challenges, and opinions of using virtual therapy. The exploratory nature of this understudied phenomenon warrants a phenomenological approach to data analysis, where the overall goal is to create an understanding of the subjective experience of participants (Bowleg, 2017).

Applied Thematic Analysis

The use of open-ended questions resulted in substantive qualitative data to conduct an applied thematic analysis of mental health challenges (RQ1) and barriers to virtual therapy as well as past experiences with professional emotional support (RQ2). See table 2 for open-ended questions used for data analysis for each research question.

Table 2

Open-ended Questions Used for Thematic Analysis

Research question	Open-ended question used for data analysis

RQ1	Please take a moment to describe any other challenges you are facing as a new mother due to the COVID-19 pandemic.
RQ2	Can you tell us a bit about your experience with receiving emotional support from a professional during your pregnancy? For example, what worked well for you or what did you not like?
	What are some reasons why you would not be open to consulting a counselor or therapist virtually?

Applied thematic analysis requires extensive reading and re-reading of data to 1) create coding schemes, 2) coalesce codes into initial themes, 3) refine themes, 4) name themes, and 5) select exemplars (see Braun and Clarke, 2006).

Following an inductive/deductive approach to qualitative analysis, two codebooks were developed for each research question containing 1) code names, 2) code definitions, 3) code description, and 4) examples of each code (see Roberts et al., 2019). The coding schemes for each codebook were first developed a priori following an extensive review of literature and initial reading of qualitative data. For example, the broad a priori code "mental health challenges" was developed before the initial round of coding to identify instances of adverse mental health reported by participants. After the initial round of coding and analytic memoing by the researcher, the codebooks were altered following inductive approaches to account for emergent patterns which were not identified through deductive codes. Each codebook went through a minimum of two rounds of application followed by analytic memoing and alteration. Analytic memos were used to summarize findings and capture the researcher's thoughts, ideas, and reflections on coding schemes and development of themes (Corbin and Strauss, 2008).

The overarching context of the pandemic greatly influenced the continued altering of codes. For example, the theme of "health-related fears and worries" was not accounted for in the initial codebook for the first research question about postpartum mental health. Several participants described health-related fears and worries about themselves or their infants contracting COVID-19 as well as how isolation would impact their child's social development. The codes initially created for this category were "fear" and "worry". Across reports of fear and worry, health-related concerns were prominent, therefore coalescing into the theme of "health-related fears and worries". Evocative exemplars were then selected for this theme and used in the presentation of findings. Each theme for RQ1 and RQ2 followed this process. Verification took place through peer debriefing, where themes and initial findings of the qualitative data were discussed and refined with a member of the research team (see Lincoln and Guba, 1985).

Findings

The first research question asked what mental health challenges postpartum women of color are experiencing during the COVID-19 pandemic. The Edinburgh Postnatal Depression Scale (EPDS) provides data on mental health, identifying participants at risk for postpartum depression (PPD). The average reported EPDS score was 11.4, with a score of 9 or higher indicating possible depression. In a recent study of PPD prevalence in low-income women and women of color before the pandemic, the average reported EPDS score was 3.9 (SD=4.5) (Klawetter et al., 2020). Such an increase in EPDS scores pre- and mid-pandemic is a cause for concern. Specific items on the EPDS add greater understanding to experiences of adverse postpartum mental health. For example, 69.6% of participants agreed with the statement "I have been anxious or worried for no good reason" and 60.8% agreed with the statement "I have been so unhappy that I have been crying".

Adverse mental health was described by participants in response to an open-ended question which asked participants to describe any challenges they were facing as a new mother due to the COVID-19 pandemic. Participant responses are presented below through an applied thematic analysis. While the prompt presented to participants was open-ended and could be interpreted in many ways, participants overwhelmingly described mental health challenges and factors contributing to adverse mental health.

Mental Health Challenges

Postpartum women of color reported various challenges leading to adverse mental health during the COVID-19 pandemic. Feelings of stress, anxiety, depression, diminished sense of safety, loneliness, fear, exhaustion, and isolation were widely reported across participants. Mental health challenges were often compounded as some participants reported multiple instances of adverse mental health in a single response. One woman, who identified as Black/African American and White, wrote: *"I feel alone and constantly worried sick. I am always at home and crave social interaction, though I fear it because I worry about my daughter's well-being."*

This response represents multiple and overlapping mental health challenges. Loneliness, fear, and worry for her newborn's well-being are all occurring for this new mother while she is restricted to the confines of her home. What is needed to help alleviate these negative experiences - social interaction - is not possible due to the need to protect her daughter from possible exposure to COVID-19. Findings of adverse mental health during the pandemic are also reflected in the general population as an overwhelming number of reports continue to roll in documenting increased rates of depression, anxiety, stress, and social isolation (Ognyanova et al., 2020; APA; 2020; Bueno-Notivol et al., 2021).

Overall, multiple mental health challenges were reported across participants. Several participants identified these mental health challenges arising due to pandemic-specific contextual factors which had negatively impacted their lives and, therefore, their mental health and well-being. An applied thematic analysis revealed four factors influencing adverse mental health: 1) social support challenges, 2) increased domestic duties, 3) financial challenges, 4) health-related fears and worries.

Factors Influencing Adverse Mental Health

Social Support Challenges. Challenges to social support, one of the most widely studied risk factors for PPD development, were reported widely across participants who were no longer able to see friends or family in-person due to mandated quarantines and social distancing requirements. Such social support challenges were straightforwardly stated by a Black/African American new mom, who wrote *"...I could have had more support from family and friends if it wasn't for the pandemic."* This lack of support is difficult for new mothers who rely on friends and family for in-person assistance and resources that arise in the postpartum period, such as childcare. One participant, identifying as Hispanic or Latino/x, wrote:

> *It's hard not to have family and friends that are willing to come and watch the kids for a minute so I can rest. When my first child was born, I had friends come by all the time. Now, people don't feel safe. I feel bad that my six month old has barely gotten to see her aunts/uncles/cousins.*

Challenges of no longer having family and friends watching their children, a form of tangible social support, was reported widely across participants. Participants discussed how not having this form of support led to increased stress and exhaustion without any time spent away from

their children. One participant, who identified as Asian/Pacific Islander, wrote: "*...I am kind of forced to spend 24 hours with the baby every day. Sometimes a break is very helpful."*

Without in-person support from friends and family, new moms have less time for themselves and are struggling to get rest that is necessary not only for parenting, but for their overall well-being. Reports of exhaustion were common across participants, which is cause for concern as fatigue has also been found to be a predictor of PPD (Bozoky et al., 2002). Challenges to social support and overall exhaustion were further compounded as participants described their specific responsibilities while at home where they were expected to balance multiple domestic and work-related responsibilities.

Increased Domestic Duties. For many participants, lockdowns and shelter in place orders imposed by governments led to increased time at home with their families, often without consistent childcare. Whereas school, daycare, or employment may have removed family members from the home several hours each day, such activities were moved entirely to the home front for many families. While some participants reported enjoying the increased time with families, others reported feelings of stress and exhaustion due to multiple demands which arose from being home each day. One participant, a Black/African American mom, shared the following:

> *Lack of childcare is extremely stressful as well as difficultly [sic] keep [sic] up with the constant house keeping [sic], cooking and cleaning. No respite time away from the kids.*

This example, although brief, shows how increased time at home results in an overwhelming balancing act of domestic-related activities. Participants are not only caring for their children but are burdened with daily time-consuming household duties necessary to care for

their families. Such household duties have arguably increased given the amount of time people are spending at home, wherein greater usage of the home (e.g. cooking of each meal) results in greater need for upkeep. The demanding nature of these tasks leaves little room for mothers to care for themselves and spend time away from their children, as they might have before quarantine restrictions instilled during the pandemic. Increased domestic duties, compounded by a lack of social support, are leaving postpartum mothers overwhelmed and exhausted.

These feelings were elevated by participants who also saw their paid employment move to the homefront at the onset of the pandemic. A Black/African American mother shared: *"Working remotely at home, and trying to take care of my child's needs at the same time can be very stressful".* As increased domestic duties clash with the responsibilities of paid employment, working mothers are suffering from conflicts of multiple roles. Stress resulting from increased domestic duties and multiple role conflicts is noteworthy given the impact of stressful life events on PPD development. While working mothers were fortunate to have a consistent income during the economic recession of the pandemic, some participants reported financial challenges which further impacted their mental health.

Financial Challenges. Participants reported current and expected financial challenges due to the economic impact of the pandemic. One participant, a Black/African American mother, summarized such financial challenges amidst the coronavirus recession: "*I am worried about my finances. Having a stable income in this horrible economy. Trying to stay afloat".* The extent of financial challenges varied across participants with some describing having their salaries reduced while others reported threats of homelessness. One participant, who identified as Hispanic or Latino/x, shared the following experiences:

The biggest issues have been finance related. I can't support my family with my

wages though I try. My landlord is evicting us for being behind on last month's rent, even though I tried paying him a big portion as a good faith payment. How can I take care of my kids if I'm being evicted? How can I continue to work when I'm being evicted? This pandemic is ruining my life, I was scraping by before, but now I've been absolutely devastated financially. This has made me severely depressed, I have panic attacks, get angry, feel hopeless. Nobody will help…

This participant describes the impact of financial hardships on her mental health while showing how the COVID-19 recession has tangibly impacted her life and well-being. Threats of homelessness, resulting in multiple and overlapping mental health challenges, leave this new mom contemplating her future ability to care for her children and meet their basic needs. In demonstrating the devastation of financial hardships, she continued her response with the following:

My landlord won't wait [for a rent payment]. Unemployment said I was too poor to receive help, because I didn't make enough pre-pandemic while I was pregnant...assistance organizations are taking too long to help me, I've got some interviews coming up for stable jobs (and somewhat livable wages) with work from home policies right now but how will I work with no home?... All it took was missing one month of rent to effectively destroy our life.

The series of events described by this participant demonstrate a domino effect caused by financial hardships. Threats of homelessness, caused by the economic impact of the recession, cannot be alleviated due to disqualification from social systems and the inability to work from home when there is not a home to go to. Such experiences demonstrate how various social

systems do not always meet the needs of pregnant women and mothers who must work less as they require more time to care for themselves and their children.

Financial challenges due to the coronavirus recession have clear impacts on mental health, serving as a risk factor for potential development of PPD. While these financial challenges vary in scope, they present real hardships for new mothers who are worried about providing for their children. Despite adverse mental health and threats of meeting their basic needs, children continued to be on the forefront of their minds as participants expressed concerns over how their children would fare during this pandemic and what their lives may look like once the pandemic had subsided.

Health-Related Fears and Worries. Health-related worries and fears were reported widely across participants. These health concerns were focused on 1) contracting COVID-19 and 2) their child's social emotional development as a result of government mandated quarantines and social distancing. One participant, who identified as Black/African American, expressed physical fear of COVID-19: "*I worry a lot about my child's health, I'm trying my best havimg [sic] them protected from coronavirus."*

Despite a physical-cognitive distinction, fear of contracting COVID-19 and child development worries work in tandem. Participants reported fear, anxiety, and diminished sense of safety over potential exposure to COVID-19 in taking their babies out of the home or inviting visitors over. With increased time spent at home and minimal in-person interactions, participants described feelings of loneliness and isolation. However, isolation used as a protective mechanism ultimately led participants to worry about their child's social emotional development as they grow in a secluded environment. One mother, who identified as Asian/Pacific Islander, shared these worries:

We are completely self-isolated. I worry that my one year old son has never played with anyone his own age ever, since he was never in daycare. I hope that he will be okay socially after this.

Several participants echoed these concerns, with some participants also mourning the "normal" life experiences their children were missing out on such as zoo or playground visits. One mother, who identified as Asian/Pacific Islander, when asked about her challenges during the pandemic, wrote:

Not being able to take my son out and look outside and explore the world. As he should. I don't want him to be held captive in our home. There's more to life than our little box. It has been 5 months and i [sic] worry for my son.

Loss of social interaction and what were considered "normal" pre-pandemic experiences with their children created deeply seated child development concerns for participants. However, the desire to protect their children and themselves from contracting COVID-19 overpowered these concerns, even if it strained family relationships. One mother, who identified as Hispanic or Latino/x, shared such an experience:

I have a mother in law that thinks she [sic] an exception to coming to visit my child during a full blown pandemic, and doesn't see the severity of the outbreak. She came to my home for seven straight weeks once a week. It gave me anxiety because she just didn't get it. I asked my husband to please tell his mother to not come over anymore. He didn't have the backbone to tell her anything. not even for my own sanity. I had to tell her myself and he was angry at me, but that's too bad.

Health-related fears and worries, and the actions taken as a result of these worries, have clear impacts on the mental health and relationships of new moms as they navigate issues such as

fear, anxiety, and loneliness simultaneously. While such feelings and experiences are considered risk factors for PPD development, one can also posit they are manifestations of PPD symptomatology. For the participant above, self-initiated isolation and resulting family tensions were necessary and justified to physically protect her child. While many participants reported struggling with isolation, both in terms of their own mental health and concerns over their child's social development, protection from the physical condition of COVID-19 came first and foremost. Inundated with worries, what are further compounded by feelings of stress, anxiety, and exhaustion, new moms are struggling during the pandemic. There is potential in telemedicine to begin addressing mental health challenges.

Barriers, Challenges, and Opinions of Virtual Therapy

Mental health challenges documented through quantitative and qualitative data show an urgent need for mental health care for postpartum women of color. Telemedicine in the form of virtual therapy is one approach and has become necessary due to requirements of social distancing imposed by the pandemic. Guided by the Technology Acceptance Model (TAM) adapted for telemedicine, the second research question asked what barriers and challenges postpartum women of color face in using communication technologies for telemedicine in the form of virtual therapy.

Enablers and Inhibitors of Telemedicine Adoption

To begin assessing enablers and inhibitors of telemedicine adoption, a broad inquiry was first made into access to technology using specific items adapted from Section B on Internet Usage from the Health Information National Trends Survey (HINTS). Findings revealed that 98.5% of participants (133 women) own a smartphone, 86% of participants (116 women)

reported having access to wifi, and 63% of participants (85 women) use a smartphone as their main device when going online at home.

Beyond access, skill in using technology for health information was also assessed via the eHealth Literacy Scale (eHEALS). The average eHEALS score was 32.5 (out of 40), indicating high confidence and skill in using technology for health information. The eHEALS also measures participants' knowledge of applying health information found online to their specific concerns. One prompt stated, "I know how to use the health information I find on the Internet to help me"; 84.5% of participants agreed with this statement. The ability of participants to evaluate the quality of health information received is also asked in eHEALS. Overall, 67.4% of participants agreed with the statement: "I can tell high quality from low quality health resources on the Internet". A high average eHEALS score of 32.5 indicates participants not only know where and how to find health information online, but also know how to apply it to their lives and evaluate the quality of information received.

High rates of technology and internet access, as well as comfortability and skill in using technology for health information, are promising enablers for the adoption of telemedicine. Looking more closely at using technology for health information through HINTS, 58.5% of participants (79 women) reported using apps dedicated to health on their smartphones. However, only 12 women (8.8% of participants) reported using various apps dedicated to mental health in particular (see Table 3). While each of these apps uses different approaches to promote mental health (e.g., meditation, self-guided modules), only *Sanvello* facilitates virtual therapy sessions with a licensed mental health provider.

Table 3

Reported Mental Health Apps Used by Participants

Mental Health Application	Description	Frequency (n)
Calm	Guided meditations, sleep stories, and relaxing music to reduce stress and anxiety and improve sleep.	4
Headspace	Guided meditation and mindfulness sessions to reduce stress and anxiety.	3
What's Up? A Mental Health App	Interactive application with games, diaries, inspirational quotes, and forums intended to alleviate negative mental health. Based in methods from Cognitive Behavioral Therapy and Acceptance Commitment Therapy.	1
Sanvello	Facilitates virtual therapy sessions as well as on-demand meditations and goal and mood tracking.	1
Breathe	Guided breathing exercises to reduce stress.	1
Oak - Meditation & Breathing	Guided and unguided meditation, sleep, and breathing exercises.	1
Om Meditation	Meditation trainer and timer using Hindu and Buddhist mantras.	1

Telemedicine in the form of virtual therapy was underutilized across participants. While 26% of participants (35 women) reported speaking to a mental health professional since giving birth, only 11% of these participants (15 women) used telemedicine in the form of virtual therapy. Further, only 12% of participants (17 women) received emotional support from a professional during their pregnancy. Despite these low reported rates of participation in mental

health care, approximately 84% of participants (113 women) were open to consulting a counselor or therapist in the future. Approximately 76% of participants (102 women) were open to consulting this therapist virtually. Openness, although not accounted for in the revised TAM for telemedicine, is a promising enabler for the adoption of telemedicine for postpartum women of color and should be considered in future studies.

Inhibitors to adopting virtual therapy were also assessed. Participants were provided a list of predetermined inhibitors under six categories: 1) privacy, 2) cost, 3) trust, 4) time, 5) energy, and 6) other (see Appendix A). While the extended version of TAM for telemedicine contains concerns of privacy, cost (as a risk factor), and trust, issues of time and energy were added to this measure as they are more relevant for the postpartum context.

The categories receiving the highest responses were cost (n=87; 64.5% of participants) and privacy (n=73; 54.1% of participants). Trust was the third highest (n=49; 36.3% of participants) followed by time (n=30; 2.02% of participants), energy (n=14; 10.4% of participants), and other (n=4; 3% of participants). In each predetermined option category, participants were also provided an "Other" option with the opportunity to write in their response. While the write-in option was generally underutilized (only 10 responses total), responses provided additional insights into barriers due to privacy ("*Embarrassed, scared and anxious if someone in my household overheard conversation or eavesdropped.*"), cost ("*Budgeting for copays.*"), and time ("*Difficulty finding the time with two children*").

Results for barriers to telemedicine usage provide evidence for the revised TAM for telemedicine under the inhibitors of perceived risk and privacy as well as the enabler of trust. Participants saw financial risks in participating in virtual therapy and feared their personal information would be overheard or shared without their consent. In this case, trust was no longer

an enabler of telemedicine adoption but could be seen as an inhibitor, as participants reported hesitation of trusting a mental health professional they had not met in-person. Barriers are elaborated upon through data provided in response to open-ended questions.

Past Experiences with Professional Emotional Support

To better understand the disparities present between participation in therapy and reported openness to adopting virtual therapy, open-ended questions were asked to assess past experiences with emotional support/therapy. Because virtual therapy is a unique form of telemedicine requiring vulnerable and lengthy disclosures with a provider, isolating past therapy experiences - whether virtual or in-person - was an intentional choice by the researcher to discover additional social enablers or inhibitors of virtual therapy adoption. This decision was supported by previous research which has shown past experiences with therapy influence an individual's decision to seek treatment in the future (Levitt et al., 2016).

Past Experiences During Pregnancy

Participants who reported receiving emotional support from a professional during their pregnancy (n=17) were asked to share about their experience with receiving this support from a professional. The open-ended term "emotional support from a professional" was used intentionally to allow participants to share about any other forms of professional support they were receiving (e.g., spiritual supports, life coaches, etc.). However, most participants described their experiences with mental health professionals such as counselors and psychologists. This question was asked specifically for the context of the perinatal (pregnancy) period as opposed to general past experiences with therapy given the specific needs and mental health challenges of perinatal women and overall relevance to the postpartum context.

Fifteen participants provided substantive responses to this prompt which were analyzed using applied thematic analysis. The small sample size allowed for a binary theme of past experiences receiving emotional support from a professional during pregnancy clustered by nature of either positive or negative. An experience was determined to be positive if the participant described an appreciation of the emotional support (*"I'm glad that I recieved [sic] emotional support during my pregnancy…"*) and effectiveness in treatment ("*Therapy worked the best as I saw a therapist weekly."*). An experience was determined to be negative if the participant described an unsatisfactory experience or ineffectiveness with the support received ("*The psychologist was judgmental and gave me poor advice*."). Exemplars showing specific aspects of what made the experience positive or negative are described below.

Positive Experiences with Professional Emotional Support. Nine of the 15 participants reported positive experiences with emotional support from a professional during pregnancy. These positive experiences were attributed to the effectiveness of treatment which helped with various mental health challenges the women were facing. Stress, anxiety, and depression were commonly reported conditions during pregnancy for which participants sought support. Participants also described various hardships they faced during pregnancy (e.g., seizures, conflicts with partners) and how professional emotional support also helped in these areas. One participant, who identified as Black/African American, described her positive experiences with counseling as she navigated an insecure housing situation:

> *it [counseling] helped a lot [sic] I was really depressed [sic] I was pregnant and I had a 3 month old baby already [sic] I was homeless sleeping house to house on shelters and hotels [sic] my councilors help [sic] me so much [sic] the sleep meds were amazing*

The benefits of professional emotional support during pregnancy were clear as participants reported how their differing needs were supported by counselors and therapists. Hardships such as insecure housing and mental health challenges are risk factors for PPD. Positive experiences with therapy therefore bolster support for mental health care as a mitigator for PPD development in postpartum women of color.

Although the focus of this prompt was not on virtual therapy, one participant, who identified as mixed raced, described her experiences of participating in therapy via video chat for her disclosed bipolar disorder:

> *It was very nice to have the mandated distanced sessions over video chat. It made things easier for me to care for my children without having to arrange for family/friends to help (the only childcare I use). It has been stress relieving as it made it easier to explain to my oldest child (5 years) my mental health condition because they [sic] able to participate and meet my provider. I periodically bring up the nature of my condition to reinforce understanding and allow for dialogue. I make sure to do so specifically when my moods noticeably fluctuate irregularly, as they did during the pregnancy.*

This response provides evidence for the ability of virtual therapy to create greater access to treatment. We also see how the benefits of virtual therapy extend into the family as the participant is no longer burdened with being the sole communicator of their mental illness. The child's ability to participate in sessions and learn about their mother's condition from a mental health professional are seen as a form of stress relief for this participant. In opening this discursive space, the participant invites her child to further discuss her condition, which allows

the child to be aware of their mother's health condition. This discursive space is a noteworthy development, as such dialogue can break stigmas which follow mental illness and treatment.

Just as the child in this dyad was receiving valuable knowledge, participants also reported how support from a professional provided them with education to understand their experiences and improve their mental health. One participant, who identified as Black/African American, shared such an experience:

> "*I was able to understand how pregnancy contributed to a lot of my emotional changes. I did not want to take anxiety medication while pregnant so it was helpful to learn how to try to prevent triggers that caused anxiety."*

Through this example, we see how the participant not only learned general knowledge about their mental health challenges, but how that knowledge transferred to action to prevent anxiety. Understanding triggers for adverse mental health, particularly in the perinatal context, can help mitigate potential risk factors for PPD or severity of PPD symptomatology. Such positive experiences with professional support provide evidence for its use as treatment for PPD and for the potential to deliver this treatment virtually to women of color.

These findings also provide support for the importance of social influence, trust, facilitating conditions, and perceived usefulness as potential enablers of virtual therapy adoption through TAM. For participants who reported having effective providers, support from their families, and a safe space to participate in treatment, therapy positively impacted their well-being. With such a large percentage of participants (84%) being open to therapy, questions remain about why mental health services remain underutilized within the sample.

Negative Experiences with Professional Emotional Support. Six of the 15 respondents reported negative experiences with emotional support from a professional during pregnancy.

These negative experiences were overwhelmingly attributed to issues with treatment received from their mental health provider. Participants reported feeling dismissed by their providers or receiving treatment which did not improve their mental health. One participant, who identified as Hispanic or Latino/x and Asian/Pacific Islander, shared: "*I had a therapist I did not like because she would tell me about my triggers constantly. She would just remind me of bad things*". Other participants reported health care providers who were insistent on them taking medicine they were not comfortable with during their pregnancy. Disagreement about treatment was a major indicator of dissatisfaction, resulting in negative experiences with professional emotional support.

One participant, who identified as Hispanic or Latino/x, described how these issues led them to stop attending counseling sessions:

> *I visited a counselor to determine if my anxiety was abnormal enough to warrant ongoing counseling sessions. She (the counselor) did not seem to think it was beyond typical transitional temporary anxiety, but I disagreed. I don't think she really listen [sic] to my concerns or believe [sic] me when I said my anxiety is worst [sic] than it appears. I did not return.*

This participant describes how their concerns were dismissed by the counselor. While pregnancy is certainly a transitional period in one's life, diagnosing a pregnant woman's anxiety as transitional and temporary fails to recognize the unique experiences of perinatal women while overlooking potential risk factors for PPD. This participant was not only dismissed and disagreed with, but left in a vulnerable state which has left them with no desire to return to therapy.

Negative experiences with providers give clear examples as to why some participants were not open to participating in therapy and provide evidence for the importance of social

influence of past providers in decisions to adopt virtual therapy. In terms of technology acceptance, negative interpersonal experiences with providers can also be seen as signs of diminished trust and perceived usefulness of the treatment, all of which are factors influencing telemedicine adoption (Kamal et al., 2020).

Reasons Against Virtual Therapy

Participants who indicated they were not open to virtual therapy, thus displaying resistance to use as identified in TAM, were asked what reasons they would be hesitant to consult a counselor or therapist virtually. Within the sample, 32 participants indicated they were not open to consulting a therapist virtually. While each participant provided a response to this prompt, these responses generally lacked detail but provided enough information for thematic analysis. Six themes were found through inductive and deductive coding using TAM as a guiding framework: 1) preference for in-person treatment, 2) belief they did not need treatment, 3) privacy concerns, 4) social influence, 5) lack of trust and comfortability, and 6) inability to afford treatment.

Preference for In-Person Treatment

Of the 32 participants who reported not being open to virtual therapy, 10 described a preference for in-person treatment, demonstrating technological anxiety and a hesitancy towards facilitating conditions, as identified in TAM. One participant, who identified as Hispanic or Latino/x, wrote, *"I prefer meeting a counselor or therapist in person than virtually, this enables me to discuss my worried [sic] in detail unlike when it's done virtually."* While this participant did not expand upon why the virtual setting creates challenges in opening up to their therapist, their response still provides insight into one way virtual therapy could potentially be less

effective for specific individuals. Those who find comfort and are open to vulnerability through in-person exchanges may benefit less from virtual therapy.

No Treatment Needed

The second biggest reason for not participating in virtual therapy was belief they did not need treatment, as described by eight participants. One participant, who identified as Asian/Pacific Islander, shared:

> *I don't feel depressed and didn't experience any post-partum [sic] depression after giving birth. I have a few random days here and there of anxiety, but that is related to Covid and are [sic] rare. I just do some meditation and go to sleep and feel back to normal the next day.*

This participant describes how only the pandemic context has impacted their mental health, as opposed to any influence inflicted by the postpartum period. Judgements about the accuracy of this claim are beyond the scope of this study. However, we are shown effective coping strategies render professional support in the form of virtual therapy as not needed for this participant.

Other participants also reported having adverse mental health symptoms but not believing these symptoms were PPD-related or required treatment. One participant, who also identified as Asian/Pacific Islander, shared, *"I feel like my symptoms are not severe enough for me to find the need to have a consultation"*. Through the TAM framework, belief one does not suffer from PPD or need therapy, reflects perceived usefulness. Perceived usefulness is an enabler only for those who believe their symptoms require treatment.

Privacy Concerns

Privacy concerns, an inhibitor of telemedicine adoption, were described by four participants. Privacy concerns varied but were mostly focused on distrust of both technology and

the mental health provider. One participant, who identified as Black/African American, wrote: "*I don't feel it [virtual therapy] would be secure, I'd be worried about my information being recorded and stolen."* Although this participant did not elaborate on exactly how they worried about their information being recorded and stolen, or who would be responsible, this response touches on the vulnerability and trust that is required for virtual therapy as participants must openly share the challenges they are facing. Patients must trust the people in their households to respect their privacy, as well as any potential unidentified individuals in the households of their provider.

Social Influence

Questions of who is in a household and could potentially hear a virtual therapy session also arose for one participant, who identified as Hispanic or Latino/x and White, and alluded to the stigma that accompanies mental illness and treatment: *"I would not sure want anyone to know I am seeing a therapist."* Fear of stigma is a powerful form of social influence in the decision to adopt telemedicine. It is particularly harmful as the suffering individual is left to deal with mental health challenges on their own. While the participant did not provide any details beyond this, fear of stigma creates questions about who, if anyone, this new mom is able to talk to about potential mental health challenges. In this case, social influence is seen as an inhibitor of telemedicine adoption as opposed to an enabler as identified in the original variation of TAM for telemedicine created by Kamal et al. (2020).

Lack of Trust and Comfortability

Lack of trust and feelings of uncomfortability were reported by seven participants. Respondents did not disclose many details about these concerns, however examples under this theme generally referred to an uncomfortability with disclosing personal issues to strangers. One

participant, who identified as Black/African American, wrote, *"I don't like to talk my feelings out to people I don't know"*. Another participant, who identified as Hispanic or Latino/x, wrote, "*Always felt more comfortable around people I know or just keeping it to myself"*. Such responses, which require reporting of personal experiences or viewpoints through a survey to an unknown audience, are reflective of the stated concerns. These findings provide support for the importance of trust as an enabler or inhibitor of telemedicine adoption.

Inability to Afford Treatment

The inability to afford treatment was only described by one participant who identified as Black/African American and gave the following response to the prompt: *"Financial reasons"*. Given 36.3% of all participants in the survey indicated they could not afford virtual therapy (See Appendix A), the fact that only one of the 32 participants who reported not being open to virtual therapy identified cost as the reason is noteworthy. Further analysis is needed to assess the differences between this subset of individuals who are not open to virtual therapy compared to the sample as a whole. Through TAM, cost of treatment is seen as a perceived risk inhibiting decisions to adopt telemedicine.

Discussion

Postpartum Mental Health in Women of Color

The findings of this study provide evidence for adverse mental health amongst postpartum women of color during the COVID-19 pandemic. High EPDS scores (M=11.4) combined with a plethora of risk factors created by the pandemic, provide evidence for the likelihood of PPD symptomatology in participants. As the world was sent into quarantine and a financial recession ensued, postpartum women were suddenly confined to their homes and tasked with caring for their newborns without tangible support from friends, family, and professional

childcare services. What has resulted are experiences of social isolation and juggling of multiple demands on the home front. These experiences have created PPD risk factors such as lack of social support and financial challenges (Beck, 2001; Robertson et al., 2004; Albuja et al., 2017). Additional challenges of increased domestic duties and health-related concerns are factors specific to the pandemic and warrant further investigation. Participants reported these factors as contributing to feelings of stress, exhaustion, diminished sense of safety, anxiety, and depression. Without a clinical diagnosis, questions remain of whether these experiences of adverse mental health are risk factors or actual manifestations of PPD.

Looking at similar studies conducted pre-pandemic on mental health in postpartum women of color (Klawetter et al., 2020), drastic increases in EPDS scores documented in the current study are a cause for great concern. While adverse postpartum mental health has now been documented globally during the pandemic (Hessami et al., 2020; Chen et al., 2021; Cameron et al., 2020; Davenport et al., 2020), centering the experiences of women of color who suffer from PPD health disparities provides valuable nuance to these conversations. The present study not only documents these challenges but provides insight as to what barriers and challenges postpartum women of color face in receiving mental health care through virtual therapy. Previous studies documenting adverse perinatal mental health during the pandemic have created calls for this research (Hessami et al., 2020; Chen et al., 2021), as virtual therapy is now a requirement due to social distancing. Understanding how to make virtual therapy more accessible and appealing to postpartum women will be valuable in the event of future pandemics as well as post-pandemic opportunities to overcome barriers such as time and energy identified by participants in the current study.

It is likely the pandemic will have long-lasting psychological and social effects that will need to be studied for years to come. One such effect is the financial challenges caused by the coronavirus recession. Financial challenges were identified by participants, ranging from decreased salaries to threats of homelessness. The well-documented relationship between SES and PPD creates concerns, as it is unclear how the SES of postpartum women may have been affected during the current recession. Additionally, PPD has also been found to negatively influence, and be a risk of homelessness (Curtis et al., 2014). How women suffering from PPD and unstable housing will fare post-pandemic should also be addressed in future studies and practice-based interventions. Pandemic-specific health concerns regarding children's social emotional development will likely need to be traced over time as well as the impact of fear of contracting COVID-19 on postnatal mental health.

Identifying the specific needs and challenges of women of color is valuable given the disparate effects of the pandemic on women and people of color. According to the United Nations Entity for Gender Equality and the Empowerment of Women (UN Women; 2020), the COVID-19 pandemic has exacerbated the following long-standing inequalities faced by women and girls around the world: 1) economic impacts due to job loss and poverty, 2) health inequalities due to less availability and prioritization of women's health services, 3) gender-based violence during stay-at-home orders, and 4) increases in unpaid domestic duties (p. 2). The findings of this study support these claims, however no evidence was provided for cases of gender-based violence.

Further, the rates at which people of color are suffering economically as well as contracting and dying from COVID-19 are alarming and rooted in histories of structural racism (Hooper et al., 2020; Chowkwanyun and Reed Jr, 2020). At the intersection of oppressions for

women and people of color, the postpartum context adds yet another vulnerability. An unprecedented pandemic taking place within pre-existing systems which marginalize women of color has only heightened the adverse effects felt by these mothers. Mental health challenges, lack of access to health care, financial challenges, and cultures which stigmatize therapy are just some examples of how postpartum women of color are tangibly impacted by systems of oppression as they navigate the pandemic. At an individual level, there is opportunity through virtual therapy to begin the care needed to grapple with adverse mental health that is influenced by these oppressions.

Acceptance of Telemedicine and Virtual Therapy

The findings of this study provide evidence for barriers and challenges postpartum women of color face in adopting telemedicine in the form of virtual therapy. Overall, 76% of participants reported being open to using virtual therapy, however only 11% of participants reported participating in virtual therapy since giving birth. This study sheds light on the disparities between openness to therapy and participation through the identification of the following inhibitors: time, energy, cost of services, mistrust of technology and mental health providers, and privacy concerns regarding personal information. Inhibitors found in the present study align with the revised TAM for telemedicine (Kamal et al., 2020) with additional inhibitors of time, energy, and mistrust of mental health providers. Such factors are specific to the postpartum period and virtual therapy as a distinct form of telemedicine. Using qualitative data allows for detailed descriptions of additional inhibitors.

While access to technology did not appear to be a barrier - most participants had access to the Internet and a mobile phone - it is worth noting 63% of participants reported using a smartphone as their main device when going online at home. Previous research on this

phenomenon, referred to as smartphone dependency, has found smartphone dependent individuals face barriers in accessing healthcare (Blumberg, 2017). While participants reported high comfortability in using technology for health information, future studies should assess how, if at all, smartphone dependency impacts access to virtual therapy.

Using TAM as a guiding framework, focusing on participants who resisted using virtual therapy also provides insight for making virtual therapy more appealing to postpartum women of color. Disagreements and negative experiences with past mental health providers is one such finding which can be addressed from various angles, including improved provider training. Given the social identities of the sample, questions of provider biases can also be posed as past studies have found clinicians to harbor ethnic and racial biases towards patients of color (Blair et al., 2013). Biases may also have presented themselves through language barriers or accent discrimination given 28% of participants reported speaking a language other than English in their homes. Despite these negative experiences, participants who reported positive past experiences provide evidence for therapy as an effective maternal mental health treatment for women of color.

Reasons for resistance to use identified by participants also aligned with the revised TAM for telemedicine (Kamal et al., 2020). Participants reported not seeing the usefulness of virtual therapy as well as privacy concerns, lack of trust, inability to afford treatment, and fear of stigma through social influence. While trust and social influence are categorized as enablers of telemedicine in the revised TAM for telemedicine, these factors were ultimately inhibitors for adoption of virtual therapy. Fear of stigma, a form of social influence, brings into question how culture and social relationships play a role in postpartum women of color's decisions to use virtual therapy. The influence of culture in particular may be more relevant for women of color

coming from diverse racial and ethnic backgrounds. Social influence and cultural stigma points to the need for bottom-up approaches following principles of human-centered design to create virtual therapy that is accessible, appealing, and culturally centered (Gonzalez et al., 2021).

Inhibitors identified by those who were open to virtual therapy and those resisting use of this technology contain many overlapping factors. Both groups identified trust, privacy, and cost as inhibitors. Factors that did not overlap were time and energy, as reported by participants who were open to virtual therapy. Time and energy can be seen as factors inherently out of the control of postpartum women, who, as reported in qualitative responses, are feeling exhausted as they care for themselves, their newborns, and other family members during mandatory quarantines. Belief they did not need treatment, social influences, and preference for in-person treatment were unique factors for participants reporting resistance of virtual therapy. These factors are inherently personal beliefs and social influences. These findings, in addition to the finding of openness as an enabler, create questions of how attitudes influencing behavior could be included in future TAMs created specifically for virtual therapy. Greater focus on attitudes also aligns with the Theory of Reasoned Action (TRA), from which the TAM is derived.

Overall, many of the findings of this study align with the TAM for telemedicine proposed by Kamal et al. (2020). The present study provides evidence through qualitative and quantitative data that TAM for telemedicine should be adapted given multiple social and behavioral factors that go into choosing to adopt this form of technology. This argument becomes more complex, however, when focusing on specific forms of telemedicine such as virtual therapy as well as the specific needs of postpartum women of color. Telemedicine can take many forms, from health information websites to synchronous meetings with doctors, and TAM for telemedicine should be modified according to the specific form of telemedicine being studied. Participating in virtual

therapy, for example, requires a dedication to continued treatment and being vulnerable and open with a provider. Such factors might not be present in mHealth or even primary care visits via video chat. Given the potential of telemedicine to overcome gaps in care for marginalized groups, investigations of how to make telemedicine, in its various forms, more easily accepted and adopted warrant future investigations through interdisciplinary approaches.

Limitations

This study was exploratory, responding to the unknown influence of the pandemic on postpartum mental health for women of color. The purpose of the findings are to document mental health challenges of postpartum women of color, including PPD risk factors, and provide baseline data for future human-centered design research on telemedicine. Given the urgency of this research topic and shelter-in-place orders posed by the pandemic, convenience sampling of participants via the online platform Prolific may have a directly impacted findings. Studies investigating use of Amazon's mTurk, a similar survey platform, have found mTurk users are generally more educated (Goodman et al., 2013) and less representative of Black and Hispanic individuals compared to the general population (Berinsky et al., 2012).

In using Prolific, questions assessing access to technology could potentially be skewed, as participants required internet access and communication technologies to complete the online survey. Additionally, participants reported living in various U.S. states, where quarantine restrictions imposed by local or state governments could have differed, potentially impacting important findings such as social isolation and social support. Future studies looking at the influence of the pandemic should consider these geographic differences and aim to sample postpartum women of color outside of platforms requiring access to communication technologies.

Another limitation of the online survey was the use of predetermined inhibitors to adopting virtual therapy. It is likely the predetermined response options (e.g., cost, time, energy, privacy concerns, and trust) primed participants who reported similar factors in their qualitative responses later in the survey. Additionally, the response options of cost, reported by 64.5% of participants, and privacy, reported by 54.1% of participants, contained more response options than the other categories. More response options likely influenced the high total response rates for these categories. Cost had the most options with four total and privacy contained the second most for a total of three (See Appendix A). The other categories only contained two response options.

Another limitation of this study is the grouping of women of color into one distinct sample. This lumping is not inclusive to the diverse identities and ethnic backgrounds participants may hold. A small sample of convenience, responding to the sudden onslaught of the pandemic, resulted in this decision by the researcher to gather urgent data to inform this exploratory study. Future studies which aim for generalizability, as well as human-centered design projects of virtual therapy, should account for the various racial and ethnic group identities women of color may hold.

Conclusion

This study provides evidence for the current state of postpartum mental health in women of color during the COVID-19 pandemic. The adverse mental health and risk factors documented in this study creates an urgent call for telemedicine in the form of virtual therapy. Through an exploratory identification of factors enabling and inhibiting the adoption of virtual therapy, this study provides evidence for the “Discover" phase in the Discover, Design, Build and Test model focused on designing virtual therapy to be more accessible to women of color. Developing

mental health technologies *with* and *for* women of color can bridge gaps to care and help alleviate PPD health disparities (Gonzalez et al., 2021).

This study also calls on the field of health communication to begin studies of PPD and interventions offered through communication technologies. PPD is greatly understudied in health communication. Approaches such as the culture-centered approach (CCA; Dutta, 2007), which create discursive spaces of health communication for marginalized groups, can produce findings of what postpartum women of color need for mental health care. This approach is particularly useful as discursive spaces have the potential for participants to gain awareness of, and challenge systemic influences of PPD health disparities, such as access to treatment (Dutta, 2007). Such conversations can shape understandings of adverse maternal mental health and re-shape cultural beliefs of mental illness and treatment. Future research is needed and can be conducted interdisciplinarily through lenses of communication technology and social support in addition to health communication. This study gathers baseline data, serving as a call to action for this work and the need to make virtual therapy widely used to bridge gaps to care for women from marginalized groups.

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Appendix A

Challenges in Talking to a Counselor or Therapist Online (check all that apply) (n=135)

Reason	Frequency	Percentage
Privacy		
I share my phone with family members	20	14.8%
I would have no place at home to talk about sensitive things)	49	36.3%
Other, please specify	4	3%
Total	73	54.1%
Cost		
Not having enough minutes on my plan	16	11.9%
I can't afford the cost of these services	49	36.3%
I do not have insurance to cover therapy	19	14.1%
Other, please specify	3	2.2%
Total	87	64.5%
Trust		
I am not sure I could trust someone I never met in person	49	36.3%
Other, please specify	0	0%
Total	49	36.3%
Time		
I am too busy to spend time talking to a therapist	27	20%
Other, please specify	3	2.2%
Total	30	20.2%

Energy		
I don't think I have the bandwidth for therapy	12	8.9%
Other, please specify	2	1.5%
Total	14	10.4%
Other challenges, please specify (total)	4	3%