

# Perceived Barriers and Facilitators of Behavioral-Health Modality Change Adoption During the COVID-19 Pandemic: A Systematic Review

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**Introduction:** During the Coronavirus Disease 2019 pandemic, there was a surge in demand for mental health services worldwide, presenting challenges for healthcare institutions as they navigated changes in policy and safety regulations. In the United States, this resulted in many behavioral health modality changes to remain in compliance with the Center for Disease Control guidelines. A growing body of literature has documented these, yet few explored barriers and facilitators affecting the adoption of these modality delivery changes. The researchers conducted a systematic review using the PRISMA method, focusing on service delivery changes across healthcare systems in the United States from March 2020 to May 2022.

**Objective:** The study objective was to identify barriers and facilitators affecting the adoption of changes to modality delivery of behavioral health services due to pandemic restrictions.

**Methods:** This was a systematic review that utilized the PRISMA method. The researchers identified 445 initial articles from eight databases using predetermined keywords and implemented a three-round screening process to select the most pertinent articles for this review. The researchers used a thematic analysis focused on user-related, program-related, technology, and environment-related constructs relevant to engagement with digital mental health interventions, and also addressed provider and administrative-related barriers and facilitators of virtual behavioral health modality changes. Barriers and facilitators were operationalized using the Borghouts Model.

**Results:** This systematic review revealed several common barriers and facilitators, including underdeveloped technology infrastructure, privacy and confidentiality concerns, poor technology literacy, availability of diverse technology options, provider technology training, and ease of integration into everyday life.

**Conclusion:** This review provides insights into barriers and facilitators of modality change adoption, which could inform the development and implementation of virtual mental healthcare services and may help optimize the application of these services by improving our understanding and ability to overcome barriers influencing their adoption.

**Keywords:** telehealth, digital mental health, alternative modalities, telemental health, technology adoption, care delivery challenges, Borghout model barriers and facilitators to technology adoption, COVID-19, PRISMA method

## Introduction

Social distancing guidelines and safety regulations during the COVID-19 pandemic created significant disruptions in healthcare delivery, including postponing elective and routine procedures.<sup>1</sup> These mandates put a strain on the traditional

model of healthcare delivery in the United States. Patients were unable to get traditional face-to-face care, which was a driving factor in institutions switching to online modalities following demand for these services. In response to this, the US healthcare system adapted their modes of service delivery to ensure they were following public safety rules and guidelines provided by the Center for Disease Control.<sup>2</sup>

Prior to 2020, telemedicine was on a steady upward trajectory, but the absolute integration and use were low.<sup>3</sup> An analysis of private insurance data showed that telemedicine accounted for 0.3% of all interactions between March and June of 2019, but that number jumped to 23.6% between March and June of 2020.<sup>4</sup> Several important changes were made by the US Department of Health and Human Services to the Health Insurance Portability and Accountability Act (HIPAA) that allowed for the development of telehealth services. These changes were prompted by the Centers for Medicare & Medicaid (CMS) temporary expansion of telehealth benefits on March 17, 2020.<sup>5</sup> This important policy change allowed for Medicaid/Medicare insurance coverage of telehealth services using virtual conferencing platforms. Consequently, this led to an incorporation of technology into routine checkups and specialized care and away from traditional in-person care.<sup>1</sup> The shift into virtual service delivery during the COVID-19 pandemic not only impacted routine and specialized healthcare but also behavioral health settings.<sup>6</sup> This change, while necessary to meet increased needs for mental health services during the pandemic, meant providers were forced to adapt at a rapid pace.<sup>7</sup>

Transitioning to a telehealth modality can be a challenging endeavor for nearly all stakeholders involved (ie, institutions, providers, patients, etc.). However, healthcare organizations focused on realizing these institutional changes by acquiring new equipment and providing training to healthcare providers, which allowed for patients to utilize telehealth services in a manner that could meet the demands created by COVID-19 in routine healthcare and specialized services, such as behavioral healthcare. In making these large-scale service modality changes, healthcare institutions faced numerous barriers and facilitators for their transition to virtual care delivery models. Successfully incorporating modality changes for behavioral healthcare delivery had additional challenges resulting from the unique and specialized nature of behavioral healthcare and complex psychological disorders, which often require intensive interpersonal communication, observation of both verbal and non-verbal cues, and privacy to share intimate details between patient and provider.

Borghouts et al,<sup>8</sup> defined digital mental health interventions (DMHIs) as the translation of psychosocial interventions into digital formats, whether these are self-guided interventions, virtually supported applications, or traditional psychotherapy transitioned into a digital format. Due to the efficacy and cost-effectiveness of DMHIs, there is great potential for a reduction in stigma, expanded capacity, and extended rural reach.<sup>9</sup> A key to the success of DMHIs is ensuring they are accessible to the target population.<sup>10</sup> The authors identified three core constructs associated with user engagement with digital mental health interventions, which we will use interchangeably with virtual behavioral health interventions. These included “user”, “program”, and “technology/environmental” related constructs that either facilitated or presented a barrier to these changes in modality type and service delivery. The Borghouts et al<sup>8</sup> framework was used to guide the current study. Moreover, Borghouts et al<sup>8</sup> argued that these types of interventions have the potential to reduce existing barriers to traditional care and increase access to mental health support and resources. This is particularly relevant in geographic regions that typically have lower rates of access to traditional face-to-face mental healthcare, such as rural areas.<sup>9</sup> DMHIs also have the potential to reduce disparities in access to mental healthcare by overcoming various barriers (eg, greater distances needed to travel to appointments due to a shortage of mental health providers, unreliable transportation, lack of anonymity, and stigma).<sup>9</sup> A systematic review was recently conducted by this current team of researchers. In a previously published paper, Elliott et al,<sup>2</sup> synthesized literature to identify the terminology associated with modality changes in behavioral health care delivery as a result of COVID-19 pandemic safety protocols in the United States. While examining the literature, we identified further potential levels of analysis; specifically, the reported barriers and/or facilitators related to changes in modality delivery during the pandemic, and whether pandemic-initiated adoptions were permanent or temporary based on the type of services changed, resources available, support for reimbursement for newly adopted delivery modalities and the specific needs of various patient populations. This review was therefore the second in a series of publications that examined pandemic-induced changes to care delivery using the PRISMA methodology. Consequently, while there may be some overlap of data (articles) analyzed for this review and the first PRISMA review conducted by this research team, the focus of the two reviews is different as the first article is aimed

at identifying the variability in terminology used to define modality delivery and this article aims to identify the barriers and/or facilitators related to a modality change adoption. Additionally, the current review was grounded in Borghouts<sup>8</sup> (2021) theoretical model, which outlines the specific constructs associated with adopting new technologies of care delivery.

The purpose of this PRISMA review was twofold: 1) to identify barriers to behavioral health modality changes implemented across healthcare settings and institutions across the US in response to the COVID-19 pandemic (March 2020 – May 2022); 2) to identify facilitators of healthcare modality changes implemented across healthcare systems and institutions in the United States during the COVID-19 pandemic (March 2020 – May 2022). The expanded adoption of telehealth utilization during this time provides an important opportunity for researchers and clinicians to further investigate factors associated with the implementation and use of technology-based health services for patients in clinical settings that may not have traditionally used these modalities. In addition, gaining a better understanding of barriers and facilitators for technology-based health services adoption can help provide greater clarity around the challenges and opportunities faced by institutions, practitioners, and unique patient populations. Thereby potentially impacting the application and acceptance of such services across healthcare systems, relevant stakeholders (eg, patients and providers), and demographic groups (eg, rural communities).

## Method

This review was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) 2020 methodology and matrix. Studies included in this review were written in English, conducted in the United States only, focused on mental health modality changes related to COVID-19 response, and published between March 11, 2020 – June 16, 2023. Keywords included were included “COVID-19” OR “pandemic” AND “Telehealth” OR “behavioral health” OR “psychotherapy” OR “counseling” OR “psychiatry” OR “mental health care” OR “health care delivery” both in the abstract with limiters of scholarly peer-reviewed journals. The “full text” searching criteria was not used as it allowed for discovery of the most relevant articles. Full-text articles not recovered were interlibrary loaned from other universities.

To meet the research needs of this study, eight databases were individually searched to identify the articles for review: APA PsycArticles, APA PsycINFO, EBSCOhost Psychology & Behavioral Sciences Collection, PubMed, Scopus, CINAHL, ProQuest Central, and Web of Science. These databases were selected as the key databases for psychological research available to the searcher and representing a wide range of journals. Potential search limitations include dates of searching and geographic limit to only the United States location.

Publications from March 11, 2020, to June 16, 2023, were included due to the specifics of the COVID-19 pandemic shutdown specifically in the United States and the last date of database searching. Due to different regulations, systems, and governmental restrictions, only studies or reports from the United States were used.

## Inclusion Criteria

Studies were included if they (1) included behavioral health modality changes implemented during the Covid-19 pandemic, (2) specifically mentioned a barrier or facilitator to the modality change, (3) were only focused on studies or reports specifically in the United States, and published in English. Titles, article metadata including keywords, abstracts, and geographical location of the study were scanned to identify appropriate articles.

## Data Extraction and Synthesis

A three-round screening process was used for exclusion screening to identify the most appropriate articles and eliminate bias and reader fatigue. An affinity matrix was used by all researchers to identify and codify themes within each article. The first two rounds of full-text screening exclusion criteria included: no modality change implemented, studies not based in the United States, not correct article type, not within the correct time parameters, and not focused on mental health or germane to the research topic. The third round of screening exclusion criteria focused on articles that specifically discussed a barrier or facilitator related to a modality change.

Any conflicts were resolved with a third reviewer. The qualitative nature of this thematic analysis may limit the generalizability of the results. This was accounted for by using a grounded theory framework.<sup>11</sup> Several authors were involved in initial coding and used a team approach during intermediate and advanced coding. To control any potential bias, such as theoretical sensitivity, in the subjective interpretation of articles into themes, we engaged various content experts from interdisciplinary fields (ie, health policy and administration, clinical psychology researchers, and clinicians) and employed a consensus approach. Utilizing the Sciwheel reference management system, the university accessible databases, and interlibrary loan, the full text of all identified articles was accessed using a collective process. Researchers used Microsoft Teams for the collection of data, organization of files, and team meetings. Microsoft Excel was used for data collection and to categorize each article based on inclusion criterion and fit with each construct and subconstruct.

## Results

### Frequency Rates

The initial search resulted in 445 articles. [Figure 1](#) provides the schematic flow of the sample identification and selection process. Forty-nine articles were used to identify barriers and facilitators to behavioral health modality changes during the COVID-19 pandemic. [Table 1](#) shows the frequency at which barriers and facilitators were discussed across articles used in our analysis. These were described using a model of barriers and facilitators in patient engagement with telehealth following the restrictions imposed by the COVID-19 pandemic, which was proposed by Borghouts et al.<sup>8</sup> For more information regarding the articles used in the current study, [Table 2](#) shows the total sample selected and gives an overview of the sample data. Constructs and subconstructs presented in this paper can be found in [Figure 2](#).

### User-Related Constructs

The user-related factors predominantly center on individual attributes, encompassing personal perspectives, skills, and past experiences with the digital modality being utilized for care. Just over one-third of the articles (34.69%) discussed facilitators<sup>18,20,39</sup> and barriers<sup>19,20,22,28,29,31,32,37,39,41,44,49,55–58,61</sup> concerning user constructs. Subconstructs focused on demographic variables, mental health status, beliefs, mental health and technology experiences, as well as the integration of intervention into everyday life. It is important to note that there were no articles that fit under the personal traits sub construct.

#### Demographics Variables

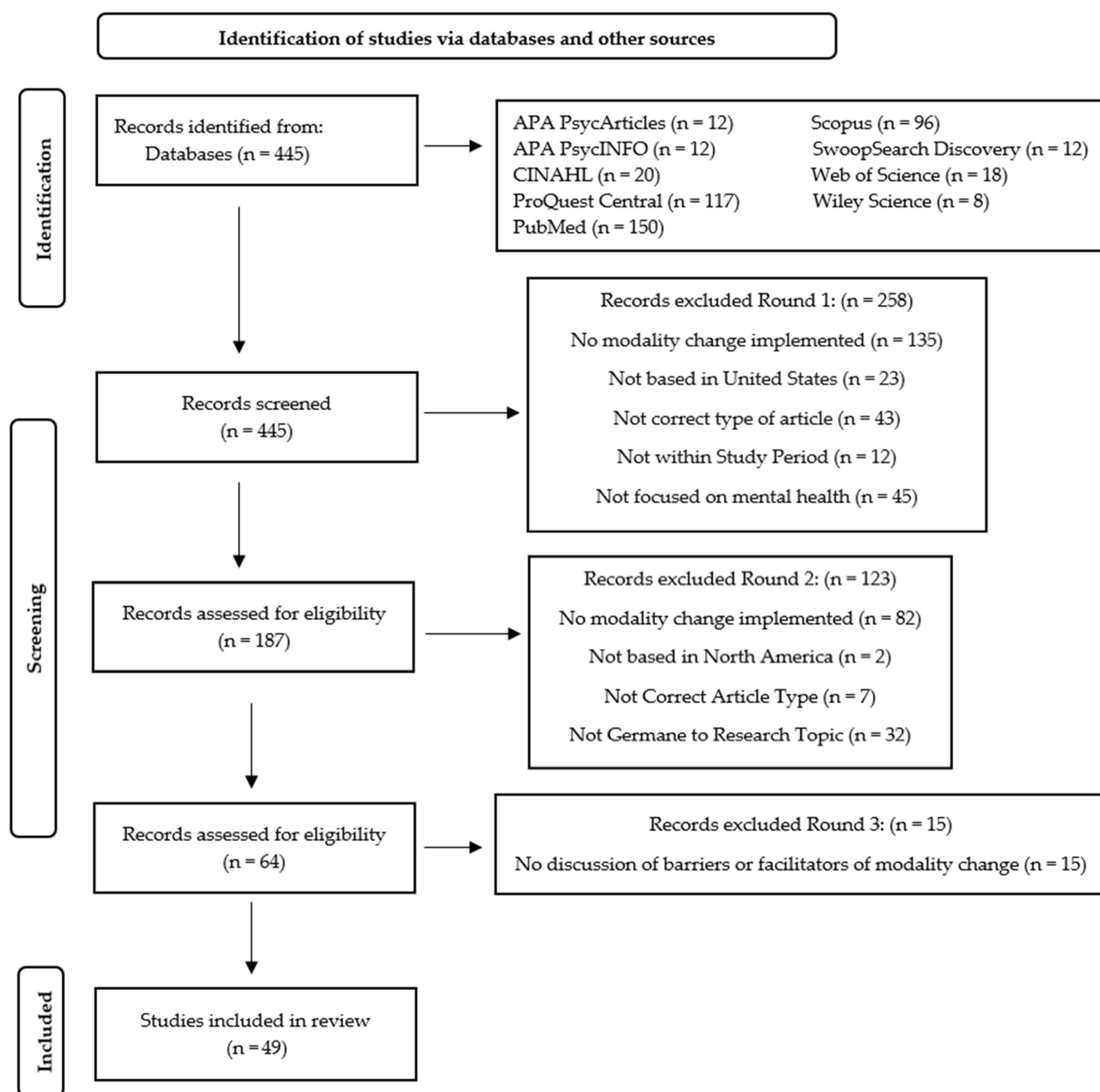
This subconstruct primarily focuses on the sociodemographic factors of an individual, specifically encompassing personal attributes. Among the identified literature, three articles described barriers,<sup>19,49,57</sup> while none addressed facilitators associated with demographic variables. The barriers centered around economics and insurance for patients. Not all healthcare facilities accepted Medicaid for telehealth services, disproportionately impacting those with a low socioeconomic status who would otherwise be unable to afford mental health care during the pandemic. The restrictions posed by costs in accessing mental health care initially increased during the change in modality, as there were disparities caused by differences in insurance policy reimbursement. These varying policies may have been a product of the sudden and immediate shift in modality.

#### Mental Health Status

Factors pertaining to the present mental health condition of the user, including the nature and intensity of symptoms, fall under the mental health status construct. Four articles highlighted barriers<sup>29,32,44,61</sup> with none providing insights into facilitators associated with mental health status. The transition to an internet-based modality posed challenges associated with mitigating patients presenting factors (ie, aggression, paranoia, physical and cognitive limitations, etc.) particularly when addressing therapy interfering behaviors on a smaller screen.

#### Beliefs

The user's beliefs concerning technology, mental health, and mental health services are encompassed within this subconstruct. Among the articles reviewed, one article highlighted both barriers and facilitators associated with beliefs.<sup>37</sup> The article mentioned patients' preference for in-person appointments. During the change in modality most care switched to the use of online appointments. Chief complaints of online appointments were centered around



**Figure 1** Depicts the preferred reporting items for rapid reviews and meta-analysis (PRISMA) and the four stages of a PRISMA review. It also presents where studies were located, exclusion criteria, and the number of studies used in the review.

difficulties in building connections through online platforms. On the facilitator side, this article highlighted patients' beliefs in favor of telehealth which were focused on therapeutic space. Specifically, patients commended for having the ability to choose a safe space for themselves to engage in therapy as opposed to going to a therapy office.

### Mental Health and Technology Experiences

This subconstruct relates to the user's past engagements with technology, mental health technology, and mental health services, as well as their competencies in digital or mental health literacy. The examined literature included eight articles that focused on barriers, while none of the articles mentioned facilitators associated with experiences involving mental health and technology.<sup>22,28,32,41,49,56,58,61</sup> Technology literacy was the primary barrier cited across the articles. Inability or limited proficiency in technology literacy can obstruct the navigation of online interventions typically associated with the

**Table 1** Barriers and Facilitators of Modality Change Adoption Occurrence Frequencies

Barriers and Facilitators	Occurrence Frequency	
	%	Count
<b>User Construct</b>	34.69%	17
Demographic variables		3
Mental health status		4
Beliefs		1
Mental health and technology experiences		8
Integration into life		6
<b>Program Construct</b>	24.48%	12
Perceived usefulness		1
Level of guidance		1
Social connectedness		10
<b>Technology and Environment Construct</b>	75.51%	37
Technology factors		28
Privacy and confidentiality		11
Implementation		13
<b>Administrative Construct*</b>	26.53%	13
Insurance/reimbursement		3
Difficulty administering therapy		4
Policy and regulations for prescriptions		2
Flexibility in work hours		2
Workflow issues		3

**Notes:** \*New construct based on findings. Adapted from Borghouts J, Eikev E, Mark G, et al. Barriers to and facilitators of user engagement with digital mental health interventions: Systematic review. *J Med Internet Res.* 2021;23(3):e24387. Creative Commons.<sup>8</sup>

change in modality. Those with low technology literacy can experience difficulties in engaging in online behavioral health sessions, potentially leading to disengagement.

### Integration into Life

The integration into life subconstruct assesses the user's capacity to allocate time and space for utilizing the intervention and seamlessly incorporating it into their routine or daily life. Within the body of literature examined, five articles outlined barriers,<sup>20,29,31,39,55</sup> and three articles<sup>18,20,39</sup> described facilitators associated with the integration into one's life. Challenges in securing childcare during appointments and dealing with distracting workspaces emerged as the primary barriers. Alternatively, facilitators revealed that other patients did not have to find childcare, faced fewer work-related time constraints, and were not limited by transportation issues for appointments.

### Program-Related Construct

Overall, relatively few of the articles used in our analyses were grouped into the Program construct (12/49; 24.48%), based on the type of barriers<sup>14,16–18,22,27,45,48,51</sup> and facilitators<sup>12,33,40</sup> reported. This construct is related to the type of treatment and/or the content offered through the digital mental health intervention.<sup>8</sup> The program-related subconstructs broadly include attitudes and beliefs about the program (eg, perceived usefulness), the level of guidance they received in navigating the program/intervention, and how the program contributes to feelings of social connectedness, or not.<sup>14,16–18,22,27,45,48,51</sup> Other subconstructs from the program-related construct are not reported in this paper due to the poor fit between those and themes identified in our analyses. These included type of content, perceived fit, and impact of intervention.



**Table 2** Study Sample-Article Title, Authors, and a Summary of Findings

Article Title	Authors	Findings/Summary
Eliciting emotional expressions in psychodynamic psychotherapies using telehealth: A clinical review and single case study using emotional awareness and expression therapy	Ahlquist & Yarns <sup>12</sup>	Barriers: Delivering psychodynamically-informed care via telehealth; unable to establish or maintain eye contact; hearing and/or patients; interruptions.
Implementing COVID-19 mitigation in the community mental health setting: March 2020 and lessons learned	Alavi et al <sup>13</sup>	Facilitators: Existing resources allowed for successful transition on telehealth delivery.
Adaptation of an academic inpatient consultation-liaison psychiatry service during the SARS-CoV-2 pandemic: Effects on clinical practice and trainee supervision	Beran & Sowa <sup>14</sup>	Barriers/facilitator: Lower consultation volume. Facilitators: Training provided for staff resulting in positive reported experiences with new technologies.
Adaptations made to pediatric consultation-liaison psychiatry service delivery during the early months of the COVID-19 pandemic: A North American multisite survey	Brahmbhatt et al <sup>15</sup>	Barriers: Restricted visitation to one caregiver per onsite patient. Facilitators: Technology enabled virtual rounding; provisions made for ongoing training.
Development of a virtual consultation-liaison psychiatry service: A multifaceted transformation	Caravella et al <sup>16</sup>	Barriers: No support for navigation of workflow changes. Facilitators: A range of pre-pandemic technology infrastructure already in place. Pandemic-protocols provided.
COVID-19, telehealth, and pediatric integrated primary care: Disparities in service use	Chakawa et al <sup>17</sup>	Barriers: Service use challenges related to modality changes, including attendance, referrals, clinical presentations, and demographic variables in a pediatric population.
Telephone vs video visits during COVID-19: Safety-net provider perspectives	Chang et al <sup>18</sup>	Barriers: provider-related challenges with technology adoption. Facilitators: Provider satisfaction with telemedicine transition reflected adequate resources and training.
Addressing pediatric mental health using telehealth during coronavirus disease-2019 and beyond: A narrative review	Cunningham et al <sup>19</sup>	Barriers: Providers reported limited access to support tools for telehealth adoption. Facilitators: Health insurance companies covered telehealth services, relaxed regulations across technological platforms.
Connecting during COVID: The application of teleservices in two integrated perinatal settings	Ehmer et al <sup>20</sup>	Facilitators: Successful implementation of technology-based services resulting in either the increase or maintenance of patient visit volumes.
The impact of the Covid-19 related transition to telehealth on visit adherence in mental health care: An interrupted time series study	Eyllon et al <sup>21</sup>	Facilitators: Adoption of an efficient model of delivery resulting in Improved telehealth visit adherence over time.
Implementation of telehealth during COVID-19: Implications for providing behavioral health services to pediatric patients	Frye et al <sup>22</sup>	Barriers: Lack of provider experience in delivering telehealth services. Strong provider preference for in-person delivery over telehealth modality.
The rise of tele-mental health in perinatal settings	Geller et al <sup>23</sup>	Barriers and facilitators: Practice regulations challenges and advantages associated with the change in modality shifting to a tele-mental health delivery system in perinatal settings.

(Continued)

Table 2 (Continued).

Article Title	Authors	Findings/Summary
The impact of COVID-19 on opioid treatment programs in the United States	Goldsamt et al <sup>24</sup>	Facilitators: Clinic directors utilized a framework for modality changes which incorporated feedback from staff and patients for continuous assessment and improvement.
Gender-affirming care without walls: Utilization of telehealth services by transgender and gender diverse people at a federally qualified health center	Grasso et al <sup>25</sup>	Facilitators: Successful telehealth training and adoption resulting in no losses of patients.
Navigating uncharted waters: Considerations for training clinics in the rapid transition to telepsychology and telesupervision during Covid 19	Hames et al <sup>26</sup>	Barriers and Facilitators: Results suggest that most university training clinics in North America transitioned to providing services exclusively via telepsychology.
Delivering intensive PTSD treatment virtually: The development of a 2-week intensive cognitive processing therapy-based program in response to COVID-19	Held et al <sup>27</sup>	Facilitators: Successful design, training and implementation of a 2-week virtual intensive treatment program (vITP) for veterans with posttraumatic stress disorder (PTSD).
Multimodule web-based COVID-19 anxiety and stress resilience training (COAST): Single-cohort feasibility study with first responders	Heyen et al <sup>28</sup>	Facilitators: Successful adoption and implementation of an unguided electronic mental health program, tailored to first responders and health care personnel.
COVID-19 impact on learning among New York state providers and learners	Hinds et al <sup>29</sup>	Facilitators: Provision of training and resources to providers for online content delivery provided by the Center for Practice Innovation (CPI).
The provision of counseling to patients receiving medications for opioid use disorder: Telehealth innovations and challenges in the age of COVID-19	Hughto et al <sup>30</sup>	Facilitators: Resources provided for implementation of counseling services via a hybrid telehealth/in-person Medications for opioid use disorder (MOUD) treatment model.
Mental health appointments in the era of COVID-19: Experiences of patients and providers	Hunsinger et al <sup>31</sup>	Facilitators: Overall relatively high provider and patient satisfaction with telehealth adoption.
What to do when being there means being vulnerable	Ilhle et al <sup>32</sup>	Facilitators: Resources provided for the implementation of remote consult and liaison inpatient services.
Conducting CBT for anxiety in children with autism spectrum disorder during COVID19 pandemic	Kalvin et al <sup>33</sup>	Barriers: Distractions in the home environment; limitations on rapport-building activities; difficulties engaging with socially impaired patients. Facilitators: Patients felt more comfortable in the home environment and more likely to share information with providers.
Virtual music therapy: Developing new approaches to service delivery	Knott & Block <sup>34</sup>	Facilitators: Designed a procedural model to support the delivery of virtual music therapy (VMT) services.
COVID-19 tele-mental health: Innovative use in rural behavioral health and criminal justice settings	Krider & Parker <sup>35</sup>	Barriers: Implementation challenges related to general administration; lack of client access to smartphones; lack of resources to support increased demands for services. Facilitators: Expanded technology; patients satisfied with increased anonymity from accessing services from the privacy of their homes.



Preserving continuity of behavioral health clinical care to patients using mobile devices	Little et al <sup>36</sup>	Barriers: Security issues prevented access to the online platform for some patients. Facilitators: Secured provision of services to smartphones for some patients.
"It's splendid once you grow into it:" Client experiences of relational teletherapy in the era of COVID- 19	Maier et al <sup>37</sup>	Barriers: Authors identified themes for challenges faced in teletherapy. These included, patients feeling less of a "safe therapeutic space" and logistical challenges such as difficulty with wi-fi connection and bandwidth. Facilitators: Increased convenience for patients and providers, providing printable versions of materials used in-session, and activities that improved feelings of connectedness between patients and providers.
Family-based treatment via videoconference: Clinical recommendations for treatment providers during COVID-19 and beyond	Matheson et al <sup>38</sup>	Barriers: Authors discussed common challenges including, patient privacy concerns, legal and regulatory issues faced, and level of comfort in providers delivering interventions via telehealth. Others included increased distractibility, building rapport, and communicating with families. Facilitators: Authors noted that using waiting-room features aided in discussion/interviews with family members and increased privacy. Increased training on common challenges, such as managing the session/distractions, etc.
Telehealth delivery of a behavioral parent training program to Spanish-speaking Latinx parents of young children with developmental delay: Applying an implementation framework approach	McIntyre et al <sup>39</sup>	Barriers: Parental preference for in-person interactions; Facilitators: Training provided for parents; Positive parental support of the transition to online platforms; Parents perceived positive benefits from transition to online platforms
Use of telehealth in substance use disorder services during and after COVID-19: Online survey study	Molfenter et al <sup>40</sup>	Facilitators: Patients perceptions of ease of use and perceived usefulness of telehealth services. Additionally, patients preferences for video-based services, and ability for telephone services to reach those with difficulty access to video-based services allowed for overall increased accessibility for patients.
Study of impact of telehealth use on clinic "No show" rates at an academic practice	Muppavarapu et al <sup>41</sup>	Barriers: Included digital/tech literacy for both patients and providers. Facilitators: Increased accessibility led to decreases in no-show rates.
Chasing the curve: Program description of the Geisinger primary care behavioral health virtual first response to COVID-19	O'Dell et al <sup>42</sup>	Facilitators: Continuing education and increased training on telehealth delivery for providers. Improving communication among staff was also found to be helpful. Identifying an appropriate platform for contacting patients via telephone.

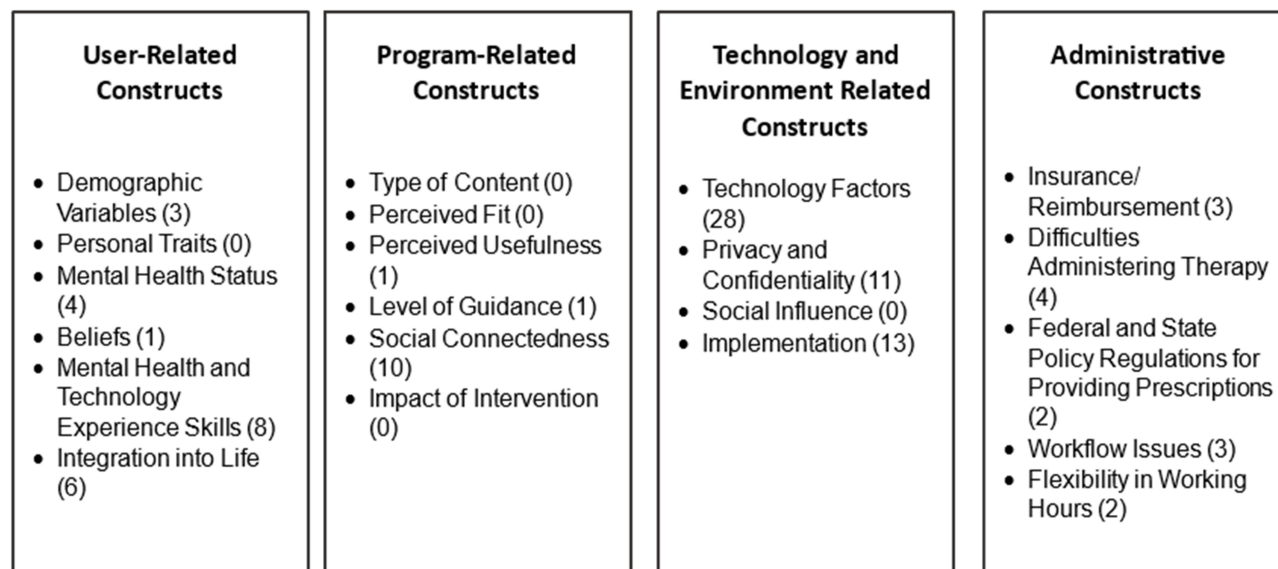
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Table 2 (Continued).

Article Title	Authors	Findings/Summary
Impact of the COVID-19 pandemic on child and adolescent mental health policy	Palinkas et al <sup>43</sup>	Barriers: Authors identified barriers including limited access to internet technology, preferences for traditional/face-to-face services from families, preference for face-to-face services, lack of privacy, difficulty in use for specific populations (young children and children seeking SUD treatment). Other barriers from a provider perspective included, finding a HIPAA compliant platform for use in therapy, challenges with reimbursement and training both clinicians and patients on using the telehealth platforms.
Efficacy of intensive CBT telehealth for obsessive-compulsive disorder during the COVID-19 pandemic	Pinciotti et al <sup>44</sup>	Facilitators: Increased access to IOP programs were important for improved outcomes for patients with OCD.
Rapid adoption and implementation of telehealth group psychotherapy during COVID 19: Practical strategies and recommendations	Puspitasari et al <sup>45</sup>	Barriers: Compassion fatigue, burnout, and clinician anxiety related to rapid transition. Authors also noted challenges in communication. Facilitators: Addressing issues by improving employee self-care training, including relevant stakeholders in policy discussions, and building upon a pre-existing model/framework of telehealth implementation.
Development of a brief group CBT intervention to reduce COVID-19 related distress among school-age youth	Rodriguez-Quintana et al <sup>46</sup>	Facilitators: This article described a process of building rapport and trust when working with children. The authors discussed how they designed, developed, and deployed a virtual program (CC-19 program) that K-12 school mental health professionals could use to address pandemic-related mental health needs.
Virtual mental health care in the veterans' health administration's immediate response to coronavirus disease-19	Rosen et al <sup>47</sup>	Facilitators: Large increases in telemedicine visits were aided by pre-existing policies in VHA administration and dissemination of equipment to veterans (eg, tablets) largely increased access to care.
Effective and accessible telephone-based psychotherapy and supervision	Rowen et al <sup>48</sup>	Facilitators: Audio-only calls for supervision were effective for providers/clinicians.
Telebehavioral health during the COVID-19 pandemic: A qualitative analysis of provider experiences and perspectives	Schoebel et al <sup>49</sup>	Barriers: Population dependent factors relating to decreased accessibility (SMI, SUD, those with limited internet access, children, and older adults) Facilitators: Increased access for most, no reduction in quality of care from the patient and provider's perspectives, and minimal concerns related to privacy.
Implementation of home-based telemental health in a large child psychiatry department during the COVID-19 crisis	Sharma et al <sup>50</sup>	Barriers: A slow transition period navigating challenges posed by rapid changes produced by COVID-19. Facilitators: Large portion of patients were established with HM-TMH approximately 6 weeks after transitioning from off-campus.

Navigating changes in the physical and psychological spaces of psychotherapists during Covid-19: When home becomes the office	Shklarski et al <sup>51</sup>	Barriers: From a provider perspective, “zoom fatigue” was one of the most commonly reported challenges. Facilitators: Providers found innovative ways to adapt to telemedicine and maintaining a meaningful relationship with patients.
Reflections on changing times	Stancin <sup>52</sup>	Facilitators: Efforts aimed at incorporating training and virtual consultation into their practice.
Patients’ perceptions of telehealth services for outpatient treatment of substance use disorders during the COVID-19 pandemic	Sugarman et al <sup>53</sup>	Barriers: More evident in transitioning group therapy for SUD treatment. Facilitators: Increased satisfaction with those transitioning to virtual individual therapy.
Telehealth and the community SMI problem: Reflections on the disrupter experience of Covid-19	Talley et al <sup>54</sup>	Barriers: The authors describes issues such as patients lacking privacy in their homes as well as reliable internet service. Also patients in their home were exposed to distractions. Online platforms impeded on certain diagnoses like paranoia or cognitive impairments as well as visual or hearing limitations. Facilitators: Logistical and financial barriers to care were identified as positive for both patients and providers
Rapid creation of child telemental health services during COVID-19 to promote continued care for underserved children and families	Tolou-Shams et al <sup>55</sup>	Barriers: Children and families with limited resources. Facilitators: More accessibility for children and their families led to decreased no-show rates after transitioning to telemedicine.
Perspectives of opioid use disorder treatment providers during COVID-19: Adapting to flexibilities and sustaining reforms	Treitler et al <sup>56</sup>	Facilitators: Increased flexibility for providers and patients improved treatment access and more individually tailored care for people seeking medications for opioid use disorder (MOUD).
Telehealth use among safety-net organizations in California during the COVID-19 pandemic	Uscher-Pines et al <sup>57</sup>	Barriers: Low-income patients may face unique barriers compared to other patients when trying to access care. Organizations sometimes lacked adequate resources to develop infrastructure required to aid in accessibility of telehealth for patients.
Suddenly becoming a “Virtual Doctor”: Experiences of psychiatrists transitioning to telemedicine during the COVID-19 pandemic	Uscher-Pines et al <sup>58</sup>	Barriers: From a provider perspective, concern about the quality of telemedicine visits and how those were addressed to facilitate positive attitudes about the transition for both patients and physicians.
Cognitive behavioral therapy in the time of the coronavirus	Waller et al <sup>59</sup>	Barriers: Patient and clinician concerns about telehealth, technical issues in implementation, and navigating changes in the environment of the patient and provider.
Implementing a low-threshold audio-only telehealth model for medication-assisted treatment of opioid use disorder at a community-based non-profit organization in Washington, D.C.	Yeo et al <sup>60</sup>	Barriers: Discussed factors which made transitioning to telehealth difficult for the population served and led to decreased retention rates. Facilitators: Low-threshold technology (audio-only) helped overcome barriers affecting retention in their MAT clinic.
Patient preferences for patient portal-based telepsychiatry in a safety net hospital setting during COVID-19: Cross-sectional study	Yue et al <sup>61</sup>	Barriers: Authors reported on patient preferences that lead to lower engagement with video-based visits.

## Proposed Model



**Figure 2** Presents an amended model, incorporating a novel administrative construct into the Borghouts model.

### Perceived Usefulness

This subconstruct refers to the user's experience with an intervention and their perceptions of whether the intervention would be useful to them. Only one article fits into this subconstruct.<sup>40</sup> Authors of this paper surveyed whether substance use treatment centers were using telehealth services (ie, telephone and video health technologies for screening, assessment, treatment), other demographic variables (eg, rurality, type of SUD treatment), and projected intent to use telehealth services after COVID-19. Their findings found significant associations between perceived usefulness and future intent to use those telehealth services, as well as perceived usefulness and perceived ease of use.

### Social Connectedness

One important factor that contributes to user engagement with a digital intervention is the level at which participants feel socially connected. There were 10 articles that discussed this topic. The findings suggest that the lack of social connectedness in virtual modality delivery was consistently cited as a barrier in the transition from in-person service delivery (9/10). Examples of this included articles which described difficulties in building a therapeutic alliance with clients via telehealth,<sup>14,16–18,22,27,45,48,51</sup> whereas one article<sup>33</sup> described an easier process of building rapport and trust when working with children who had autism spectrum disorder. Those authors cited the reasons as an increased ability for children to share and discuss their likes and interests (eg, artwork, stuffed animals) that were in their personal physical environment, which also helped the clinicians learn more about the children than they normally could without bringing in those materials and information from the children's homes.

### Technology and Environment Related Constructs

A significant portion of the reviewed literature (37/49; 73.47%) discussed barriers<sup>13–15, 17,18,21,22,26,29,31, 34–36, 37–39,41,42,44, 45–47, 49–53, 55–59, 61</sup> and/or facilitators<sup>12,23,30,40,41,50,54</sup> concerning technology and the environment. As the onset of the pandemic began, technology rapidly became the solution to the continuum of mental health care. The abrupt paradigm shift in modality brought with it both advantages and disadvantages to patients and providers. The technology and environment-related factors dive into the multifaceted dimensions surrounding the utilization of technology and implementation, encompassing subconstructs such as technology-related factors, privacy and confidentiality, and implementation. Additionally, none of the articles selected fit under the social influence subconstruct.

## Technology-Related Factors

Within this subconstruct, the primary focus was on the technology utilized to deliver the intervention. In most cases, this included the platform on which an intervention was delivered (ie video-conferencing applications, phone calls, web portals, and online programs). A notable majority of the articles (28/37) discussed technology-related factors. A total of six articles mentioned facilitators<sup>12,23,25,40,41,50</sup> and 22 articles highlighted barriers.<sup>13–15,17,22,34–39,41,42,46,47,49,50,52,53,55–57</sup> Instances included articles that outlined challenges in technology infrastructure for the patient<sup>14,17,22,34,35,37–39,41,46,47,49,50,52,53,55–57</sup>, and provider<sup>13–15,17,34–36,42,57</sup> with emphasis on accessibility, ease of use, and reliability of the technology being some of the most common issues. The presence of diverse technological options<sup>25,40,41,50</sup> allowed for custom solutions to different needs as well as enhancing the adaptability of the technology. On the provider side, comprehensive training in technology utilization<sup>12,23</sup> equipped providers with the necessary skills to integrate technology into practice.

## Privacy and Confidentiality

The central emphasis of this subconstruct surrounds data storage and sharing, specifically, in terms of the comfort levels of users in revealing sensitive details during an intervention. Eleven articles highlighted language pertaining to privacy and confidentiality,<sup>18,22,26,38,42,49,51,55,58,59,61</sup> all of which were considered barriers. The primary focus of these articles predominantly centered around issues on the utilization of data,<sup>42,55,58,59</sup> protection of private data,<sup>18,38,42,49,55,61</sup> and safety.<sup>22,26,55,58</sup> Key considerations included protocols, ethical, and legal aspects surrounding data usage, encompassing discussions on data ownership, control, and security.

## Implementation

Implementation encompasses factors related to how the intervention was executed. A total of 13 articles highlighted implementation in some form. Twelve articles<sup>14,21,22,26,29,31,42,44,45,49–51</sup> explored implementation barriers, while one article<sup>30</sup> explored implementation facilitators. Examples of these included articles which examined issues in patient engagement,<sup>22,29,31,42,44,51</sup> provider technology training,<sup>21,45,50</sup> and licensure requirements,<sup>14,26,49</sup> while one article<sup>30</sup> described how the implementation of structured technology rollout programs helped ensure integration of technology into existing systems, which promoted successful adoption.

## Administrative Construct

Some of the articles collected (13/49; 26.53%) did not fit into any of the constructs proposed by Borghouts et al (“user”, “program/intervention”, “technology and environment”).<sup>6</sup> Specifically, the data showed that there was an additional construct comprising articles related to implementation and administration of DMHIs and discussed administrative topics that impacted new modality adoption and engagement.<sup>14,16,18–20,22,24,29,33,38,43,49,60</sup>

## Insurance/Reimbursement

Three articles identified insurance/reimbursement as important factors related to the adoption of new modalities of care delivery. Authors reported difficulty being reimbursed by insurance for telehealth services at the same rate as they would for in-person care.<sup>14,19,49</sup> One article reported insurance/reimbursement as both a barrier and facilitator to adoption of a new modality.<sup>14</sup> Specifically, the authors reported that while the administrative cost of navigating new lines for reimbursement was a challenge, the reimbursement rates for services provided by the newly adopted modality were at a higher rate than for the previous mode of delivery for the same service. Additionally, the new system of delivery and reimbursement (once adopted) was an easier administrative process to navigate and thus allowed them to continue seeing patients after the pandemic via this modality.

## Difficulties Administering Therapy

A total of four articles cited examples of situations where the transition from in-person services to telehealth was met with challenges related to the nature of the mental illness and clinical presentation of the patients and consequently, increased difficulty in administering therapy via the new telehealth modality.<sup>22,29,33,38</sup> Of the articles which included barriers related to the administration of therapy, there was mention of difficulties such as managing distractions and maintaining engagement with patients that had/were being treated for severe mental illness. These new modalities

required providers to adapt to delivering care synchronously using technological platforms that they may not have been familiar with.

### Federal and State Policy Regulations for Providing Prescriptions

Federal and state policy and regulations for providing prescriptions via a new modality of care delivery were also identified as barriers from the implementation and administrative perspectives.<sup>24,43,60</sup> These articles discussed policy and regulations for medication-assisted treatment programs for individuals with opioid use disorders. They reported difficulty in transitioning to virtual or telehealth-related care due to the restrictions imposed by the Controlled Substances Act,<sup>62</sup> which previously did not allow for prescription of opioids without a prior in-person medical evaluation. However, the Secretary of Health and Human Services declared a public health emergency under 42 U.S.C. 247d (section 319 of the Public Health Service Act), as set forth in 21 U.S.C. 802(54)(D). On March 16, 2020, the Secretary, with the concurrence of the Acting DEA Administrator, designated that the telemedicine allowance under section 802(54)(D) applies to all schedule II–V controlled substances in all areas of the United States.<sup>63</sup> Following these changes, providers and administrators had to quickly navigate newly established short-term regulations that supported the adoption of new modalities of care delivery over a short period of time. Examples of these included facilitators such as using audio-only methods to reduce barriers to accessing care for individuals in opioid use disorder (OUD) treatment programs.

### Workflow Issues

Another implementation/administrative barrier identified by providers was workflow issues.<sup>16,18,20</sup> Changes in delivery modality meant a change in process as there was more dependence on online communication within organizations and provider teams. These changes required new and innovative workflow parameters that were challenging to adopt and implement. Examples of workflow issues included timely communication of patient screening results to determine scheduling and rescheduling of appointments.<sup>20</sup> In multi-site organizations, workflows had to be modified to meet the individual needs of each clinical setting.<sup>16</sup> Lastly, authors discussed the increased difficulty in the ability to regularly consult with colleagues due to changes in location and no longer being able to readily access colleagues.<sup>18</sup> Two of the articles discussed a change in procedure to interacting with patients in person which involved using more space in the facility to maintain social distance. However, this created a need for more staff to adequately cover the area.<sup>16,20</sup>

### Flexibility in Working Hours

Three articles were grouped based on reporting increased flexibility in work hours as a facilitator to adoption of a new modality.<sup>12,30,33</sup> Findings showed that through the adoption of telehealth services, it was not only beneficial to patients but also to staff who could save on commuting time and costs. This type of flexibility was viewed as a benefit that could combat high rates of turnover and burnout experienced by clinical staff during the pandemic. Additional examples for this subconstruct included articles which discussed the benefits of mental health providers being allowed more flexibility in scheduling clients, allowing for patients to have increased ease in scheduling and attending appointments (eg, appointments available after traditional work hours and on the weekends,<sup>30,33</sup>) and the ability to complete training that would have been inflexible and in person prior to modality changes virtually.<sup>12</sup>

## Discussion

The COVID-19 pandemic created increased demand for mental health services that required rapid engagement with virtual behavioral health modalities. In this review, barriers and facilitators associated with the adoption of virtual behavioral health care modalities during the COVID-19 pandemic were examined. This review included articles in a range of clinical settings, including community mental health, pediatric psychiatry clinics, perinatal care centers, inpatient psychiatry units, university training clinics, criminal justice environments, VA medical clinics, and hospital facilities. The researchers presented the diverse demographics served across these settings, encompassing various age groups, mental health conditions, and presenting issues. This study specifically addressed four domains: three focused on user engagement are further broken into user-related, program-related, and technology-related constructs, following a framework offered by Borghouts et al.<sup>8</sup> In addition, we address a novel, fourth administrator/provider-related domain of



virtual behavioral health modality changes. This approach was chosen because while pre-existing theories of technology acceptance could be relevant, they fell short of capturing the complexity of this rapidly evolving change.

Across the four domains reviewed, barriers were identified more frequently than facilitators. Identified barriers included financial and insurance challenges, such as disparities in insurance coverage and provider reimbursement for telehealth services, patient preference for in-person appointments, limitations in technology literacy among patients, unreliable internet services, difficulty building therapeutic rapport in telehealth modalities, privacy and confidentiality concerns, difficulties in engaging patients in telehealth services, navigating evolving federal and state policy regulations for prescribing controlled substances, and issues in transitioning workflow to fully or predominantly online modalities. In contrast, themes that emerged as facilitators across the four domains included patients' belief in the usefulness of telehealth, accessibility of telehealth, ease of integration into daily life, increased reimbursement rates for providers during the COVID-19 pandemic, technology's ability to allow physical distancing and safety, and flexibility in work hours for providers.

These results align with findings in the computer science literature, especially the Technology Acceptance Model (TAM),<sup>64</sup> the Unified Theory of Acceptance and Use of Technology (UTAUT), and its extension of (UTAUT2).<sup>65</sup> The TAM model emphasized perceived usefulness, perceived ease of use, and external variables which impact the adoption of any technology.<sup>66,67</sup> The UTAUT and UTAUT2 models instead include "effort expectancy" which has been found to be critical in mobile health (mHealth) adoption.<sup>68</sup> Likewise, facilitators like those we described have been identified in UTAUT as vital to mobile health apps.<sup>69</sup> Although these models are detailed, a shortcoming of these models is that they do not truly encapsulate the complicated socio-cultural factors influencing mHealth utilization. Although each of these theories described previously had considerable overlap, none alone provides a comprehensive picture, and the Borghout model with an additional administrative-related construct was added.

The results also align with a similar systematic review that identified barrier and facilitator themes that were associated with satisfaction with telemedicine interventions and various health outcomes.<sup>70</sup> The authors identified social support and convenience as common facilitator themes. Perceived ease of use, technology literacy, and increased connectedness were less frequent facilitators, and were related to satisfaction with telemedicine interventions more generally. There were similarities and differences with the findings in this recent review and the findings in the present review. In terms of differences, rather than a stand-alone theme, convenience would have been grouped with the integration into life subconstruct according to the Borghout model.<sup>8</sup> In addition, technology literacy was not one of the most frequently reported facilitators.<sup>70</sup> When looking at barriers, the findings align more closely. In both studies, technology literacy and confidentiality concerns were the most frequently cited. Preference for in-person appointments and perceived ease of use were also mentioned at similar rates. The two studies differed significantly in that workflow-related issues and insurance reimbursement for providers were the only themes that would be captured in administrative-related subconstructs in our proposed model, whereas the present review found these issues as well as therapy administration difficulties and regulatory hurdles. Conversely, flexibility in working hours emerged as a notable facilitator, suggesting that administrative adaptability could significantly improve telehealth delivery. This may be due to differences in research question and methodology. For example, the current study focused specifically on behavioral health modality changes, whereas the other recent review did not.<sup>70</sup> Their medical focus also likely influenced their choice in using population and intervention variables, control groups, and outcomes (PICO) to orient their study. The focus on behavioral health modality changes allowed researchers in the current review to identify themes relevant to administrative/provider facing themes in behavioral health, such as difficulties administering therapy and federal and state policy regulations for prescriptions.

The present review is unique in using the framework offered by Borghouts et al and including the additional construct of provider-facing/administrative themes, with a focus on behavioral health modality changes.

This review shows the importance of public health experts to consider technological, socio-cultural, and psychological factors involved in deploying mental health tools to hard- to- reach populations.<sup>70</sup> Particularly in light of world events such as the COVID-19 pandemic, it is vital to include an interdisciplinary approach to overcome essential barriers in the use of technological artifacts utilizing human-centered design in order to address mental health needs, as we have seen applied to housing insecurity issues.<sup>71</sup> By relying on interdisciplinary approaches, the models can be robust enough

to develop roll out plans while remaining flexible for adaptation to respond to environmental challenges such as global pandemics and ever-changing policies and regulations.<sup>72</sup>

## Limitations

As discussed in the Method sections, the generalizability of these results may be limited by the qualitative nature of this thematic analysis; however, this was accounted for by using a grounded theory framework.<sup>11</sup> Nonetheless, future research using quantitative approaches such as questionnaires that are related to important clinical outcomes and attitudes may contribute to this area. The applicability and replicability of these findings may also be influenced by the cultural and social contexts that the researchers are inherently embedded in. For example, some articles could have been grouped into the demographic characteristics subconstruct such as socioeconomic status (SES), or insurance coverage, or into the environment subconstruct. Moreover, the barriers and facilitators identified in the present review emerged in the context of a unique global pandemic, which forced a modality switch to virtual behavioral health. Whether these barriers and facilitators persist post-COVID contexts in which virtual behavioral health options are encouraged and desired remains to be seen.

## Conclusion

This systematic review identified key barriers and facilitators to changing the modality of delivery for behavioral healthcare services during the COVID-19 pandemic, utilizing the Borghouts model as the primary framework. The findings of this study highlight the complex interplay of user-related, program-related, technology and environment-related, and administrative constructs in shaping the adoption and implementation of telehealth services, specifically within behavioral healthcare systems.

User-related constructs (34.69%) revealed that demographic variables, mental health status, beliefs, and experiences with mental health and technology significantly influenced engagement in telehealth. Economic and insurance barriers, a preference for in-person care, and challenges related to technology literacy were prominent obstacles. However, facilitators such as the ability to choose a safe space, reduced transportation needs, and fewer childcare and work-related constraints illustrated the potential benefits of telehealth.

Program-related constructs (24.48%) emphasized the dual role of perceived usefulness and social connectedness. While social connectedness was a barrier in some cases, it served as a facilitator for children who felt safer in their environments, indicating the nuanced impact of these constructs.

Technology and environment-related constructs (75.51%) were paramount in both enabling and obstructing telehealth adoption. Factors like technology access, privacy concerns, data storage, patient engagement, and provider training were critical. Effective implementation required addressing these challenges to enhance user engagement and satisfaction.

Administrative constructs (26.53%), newly introduced in this study, revealed additional barriers such as insurance reimbursement issues, therapy administration difficulties, regulatory hurdles, and workflow challenges. Conversely, flexibility in working hours emerged as a notable facilitator, suggesting that administrative adaptability could significantly improve telehealth delivery.

Overall, this study highlights the necessity for a multifaceted approach in addressing barriers and leveraging facilitators to optimize the delivery of behavioral healthcare services in a telehealth context. Policymakers, healthcare providers, and technology developers must collaborate to address these diverse factors, ensuring equitable access and effective utilization of telehealth services in the post-pandemic era. Additionally, this review builds upon previous research and gives a comprehensive overview of barriers and facilitators of modality change adoption by organizations which offered behavioral healthcare in the midst of COVID-19. Further research is warranted to explore the long-term impacts and potential strategies to overcome these challenges, ultimately enhancing the resilience and responsiveness of behavioral healthcare systems.

## Acknowledgments

This paper is dedicated to Dr. Michael Morris, who was an excellent mentor, colleague, and friend. We would like to thank him for his years of service in education and acknowledge his role in initiating and managing this project.

## Funding

The author(s) declare financial support was received for the research, authorship, and/or publication of this article. Payments were made through grant funding (\$900,000.00) from the Health Care Service Corporation (HCSC)- this is an unrestricted research grant awarded. The funder had no input or influence on the development of or conduct of the research presented in this manuscript. The project was partially funded through HCSC/BCBSTX, Affordable Cures Grant #1122327.

## Disclosure

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

## References

- Alexander M, Unruh L, Koval A, Belanger W. United States response to the COVID-19 pandemic, January-November 2020. *Health Econ, Policy Law*. 2021;17(1):1–29. doi:10.1017/s1744133121000116
- Elliott KS, Nabulsi EH, Sims-Rhodes N, et al. Modality and terminology changes for behavioral health service delivery during the COVID-19 pandemic: a systematic review. *Front Psychiatry*. 2024;14. doi: 10.3389/fpsyt.2023.1265087.
- Shaver J. The state of telehealth before and after the COVID-19 pandemic. *Prim Care*. 2022;49(4):517–530. doi:10.1016/j.pop.2022.04.002
- Weiner JP, Bandean S, Hatef E, Lans D, Liu A, Lemke KW. In-person and telehealth ambulatory contacts and costs in a large US insured cohort before and during the COVID-19 pandemic. *JAMA Network Open*. 2021;4(3):e212618. doi:10.1001/jamanetworkopen.2021.2618
- CMS. Medicare telemedicine health care provider fact sheet. www.cms.gov. Available from: <https://www.cms.gov/newsroom/fact-sheets/medicare-telemedicine-health-care-provider-fact-sheet>. Accessed March 17, 2020.
- Pinals DA, Hepburn B, Parks J, Stephenson AH. The behavioral health system and its response to COVID-19: a snapshot perspective. *Psychiatr Serv*. 2020;76(1):appi.ps.2020002. doi:10.1176/appi.ps.202000264
- Pierce BS, Perrin PB, Tyler CM, McKee GB, Watson JD. The COVID-19 telepsychology revolution: a national study of pandemic-based changes in U.S. mental health care delivery. *Am Psychol*. 2020;76(1):14–25. doi:10.1037/amp0000722
- Borghouts J, Eikey E, Mark G, et al. Barriers to and facilitators of user engagement with digital mental health interventions: systematic review. *J Med Internet Res*. 2021;23(3):e24387. doi:10.2196/24387
- Graham AK, Weissman RS, Mohr DC. Resolving key barriers to advancing mental health equity in rural communities using digital mental health interventions. *JAMA Health Forum*. 2021;2(6):e211149. doi:10.1001/jamahealthforum.2021.1149
- Lattie EG, Stiles-Shields C, Graham AK. An overview of and recommendations for more accessible digital mental health services. *Nat Rev Psychol*. 2022;1(2):87–100. doi:10.1038/s44159-021-00003-1
- Chun Tie Y, Birks M, Francis K. Grounded theory research: a design framework for novice researchers. *SAGE Open Med*. 2019;7(1):1–8. doi:10.1177/2050312118822927
- Ahlquist LR, Yarns BC. Eliciting emotional expressions in psychodynamic psychotherapies using telehealth: a clinical review and single case study using emotional awareness and expression therapy. *Psychoanal Psychother*. 2022;36(2):1–17. doi:10.1080/02668734.2022.2037691
- Alavi Z, Haque R, Felzer-Kim IT, Lewicki T, Haque A, Mormann M. Implementing COVID-19 mitigation in the community mental health setting: march 2020 and Lessons Learned. *Community Ment Health J*. 2020;57:57. doi:10.1007/s10597-020-00677-6
- Beran C, Sowa NA. Adaptation of an academic inpatient consultation-liaison psychiatry service during the SARS-CoV-2 pandemic: effects on clinical practice and trainee supervision. *J Acad Consult Liaison Psychiatry*. 2021;62(2):186–192. doi:10.1016/j.psychm.2020.11.002
- Brahmbhatt K, Mournet AM, Malas N, et al. Adaptations made to pediatric Consultation-liaison psychiatry service delivery during the early months of the COVID-19 pandemic: a North American multisite survey. *J Acad Consult Liaison Psychiatry*. 2021;62(5):511–521. doi:10.1016/j.jaclp.2021.05.003
- Caravella RA, Deutch AB, Noulas P, et al. Development of a virtual consultation-liaison psychiatry service: a multifaceted transformation. *Psychiatr Ann*. 2020;50(7):279–287. doi:10.3928/00485713-20200610-02
- Chakawa A, Belzer LT, Perez-Crawford T, Yeh HW. COVID-19, telehealth, and pediatric integrated primary care: disparities in service use. *J Pediatr Psychol*. 2021;46(9):1063–1075. doi:10.1093/jpepsy/jsab077
- Chang JE, Lindenfeld Z, Albert SL, et al. Telephone vs. video visits during COVID-19: safety-net provider perspectives. *J Am Board Fam Med*. 2021;34(6):1103–1114. doi:10.3122/jabfm.2021.06.210186
- Cunningham NR, Ely SL, Barber Garcia BN, Bowden J. Addressing pediatric mental health using telehealth during coronavirus disease-2019 and beyond: a narrative review. *Acad Pediatr*. 2021;21(7):1108–1117. doi:10.1016/j.acap.2021.06.002
- Ehmer AC, Scott SM, Smith H, Ashby BD. Connecting during COVID: the application of teleservices in two integrated perinatal settings. *Infant Ment Health J*. 2022;43(1):127–139. doi:10.1002/imhj.21958
- Eyllon M, Barnes JB, Daukas K, Fair M, Nordberg SS. The impact of the Covid-19-related transition to telehealth on visit adherence in mental health care: an interrupted time series study. *Adm Policy Ment Health*. 2021;49(3). doi:10.1007/s10488-021-01175-x
- Frye WS, Gardner L, Campbell JM, Katzenstein JM. Implementation of telehealth during COVID-19: implications for providing behavioral health services to pediatric patients. *J Child Health Care*. 2021;26(2):136749352110073. doi:10.1177/13674935211007329
- Geller PA, Spiecker N, Cole JCM, Zajac L, Patterson CA. The rise of tele-mental health in perinatal settings. *Semin Perinatol*. 2021;45(5):151431. doi:10.1016/j.semperi.2021.151431
- Goldsamt LA, Rosenblum A, Appel P, Paris P, Nazia N. The impact of COVID-19 on opioid treatment programs in the United States. *Drug Alcohol Depend*. 2021;228:109049. doi:10.1016/j.drugalcdep.2021.109049

25. Grasso C, Campbell J, Yunkun E, et al. Gender-affirming care without walls: utilization of telehealth services by transgender and gender diverse people at a federally qualified health center. *Transgend Health*. 2021;7(2). doi:10.1089/trgh.2020.0155
26. Hames JL, Bell DJ, Perez-Lima LM, et al. Navigating uncharted waters: considerations for training clinics in the rapid transition to telepsychology and telesupervision during COVID-19. *J Psychother Integr*. 2020;30(2):348–365. doi:10.1037/int0000224
27. Held P, Klassen BJ, Coleman JA, Thompson K, Rydberg TS, Van Horn R. Delivering intensive PTSD treatment virtually: the development of a 2-week intensive cognitive processing therapy–based program in response to COVID-19. *Cogn Behav Pract*. 2020;28(4):543–554. doi:10.1016/j.cbpra.2020.09.002
28. Heyen JM, Weigl N, Müller M, et al. A multi-module web-based COVID-19 anxiety and stress resilience training (COAST): single cohort feasibility study in first responders (Preprint). *JMIR Form Res*. 2021;5(6):e28055. doi:10.2196/28055
29. Hinds MT, Covell NH, Wray-Scriven D. COVID-19 impact on learning among New York state providers and learners. *Psychiatr Serv*. 2020;71(12):1324–1325. doi:10.1176/appi.ps.202000605
30. Hughto JMW, Peterson L, Perry NS, et al. The provision of counseling to patients receiving medications for opioid use disorder: telehealth innovations and challenges in the age of COVID-19. *J Subst Abuse Treat*. 2021;120:108163. doi:10.1016/j.jsat.2020.108163
31. Hunsinger N, Hammarlund R, Crapanzano K. Mental health appointments in the era of COVID-19: experiences of patients and providers. *Ochsner J*. 2021;21(4):335–340. doi:10.31486/toj.21.0039
32. Ihle EC, Roberts KE, Pessin H, Applebaum A, Breitbart W. What to do when being there means being vulnerable. *Psychiatric Times*. 2020;37(10):23–25.
33. Kalvin CB, Jordan RP, Rowley SN, et al. Conducting CBT for anxiety in children with autism spectrum disorder during COVID-19 pandemic. *J Autism Dev Disord*. 2021;51(11):4239–4247. doi:10.1007/s10803-020-04845-1
34. Knott D, Block S. Virtual music therapy: developing new approaches to service delivery. *Music Ther Perspect*. 2020;38(2):151–156. doi:10.1093/mtp/miaa017
35. Krider AE, Parker TW. COVID-19 tele-mental health: innovative use in rural behavioral health and criminal justice settings. *Rural Ment Health*. 2021;45(2):86–94. doi:10.1037/rmh0000153
36. Little J, Schmeltz A, Cooper M, et al. Preserving continuity of behavioral health clinical care to patients using mobile devices. *Mil Med*. 2021;186(Supplement\_1):137–141. doi:10.1093/milmed/usaa281
37. Maier CA, Riger D, Morgan-Sowada H. “It’s splendid once you grow into it.” Client experiences of relational teletherapy in the era of COVID-19. *J Marital Fam Ther*. 2021;47(2):304–319. doi:10.1111/jmft.12508
38. Matheson BE, Bohon C, Lock J. Family-based treatment via videoconference: clinical recommendations for treatment providers during COVID --19 and beyond. *Int J Eat Disord*. 2020;53(7):1142–1154. doi:10.1002/eat.23326
39. McIntyre LL, Neece CL, Sanner CM, Rodriguez G, Safer-Lichtenstein J. Telehealth delivery of a behavioral parent training program to Spanish-speaking Latinx parents of young children with developmental delay: applying an implementation framework approach. *School Psych Rev*. 2021;51(2):1–15. doi:10.1080/2372966x.2021.1902749
40. Molfenter T, Roget N, Chaple M, et al. Use of telehealth in substance use disorder services during and after COVID-19: online survey study. *JMIR Mental Health*. 2021;8(2):e25835. doi:10.2196/25835
41. Muppavarapu K, Saeed SA, Jones K, Hurd O, Haley V. Study of impact of telehealth use on clinic “no show” rates at an academic practice. *Psychiatr Q*. 2022;93(2):689–699. doi:10.1007/s11126-022-09983-6
42. O’Dell SM, Hosterman SJ, Parikh MR, Winnick JB, Meadows TJ. Chasing the curve: program description of the Geisinger primary care behavioral health virtual first response to COVID-19. *Rural Ment Health*. 2021;45(2):95–106. doi:10.1037/rmh0000180
43. Palinkas LA, De Leon J, Salinas E, et al. Impact of the COVID-19 pandemic on child and adolescent mental health policy and practice implementation. *Int J Environ Res Public Health*. 2021;18(18):9622. doi:10.3390/ijerph18189622
44. Pinciotti CM, Bulkes NZ, Horvath G, Riemann BC. Efficacy of intensive CBT telehealth for obsessive-compulsive disorder during the COVID-19 pandemic. *J Obsessive Compuls Relat Disord*. 2021;32:100705. doi:10.1016/j.jocrd.2021.100705
45. Puspitasari AJ, Heredia D, Gentry M, et al. Rapid adoption and implementation of telehealth group psychotherapy during COVID 19: practical strategies and recommendations. *Cogn Behav Pract*. 2021;28(4):492–506. doi:10.1016/j.cbpra.2021.05.002
46. Rodriguez-Quintana N, Meyer AE, Bilek E, et al. Development of a Brief Group CBT Intervention to Reduce COVID-19 Related Distress Among School-Age Youth. *Cogn Behav Pract*. 2021;28(4):642–652. doi:10.1016/j.cbpra.2021.03.002
47. Rosen CS, Morland LA, Glassman LH, et al. Virtual mental health care in the Veterans Health Administration’s immediate response to coronavirus disease-19. *Am Psychol*. 2021;76(1):26–38. doi:10.1037/amp0000751
48. Rowen J, Giedgowd G, Baran D. Effective and accessible telephone-based psychotherapy and supervision. *J Psychother Integr*. 2021;32(1). doi:10.1037/int0000257
49. Schoebel V, Waymont C, Gaiser M, Page C, Buche J, Beck AJ. Telebehavioral health during the COVID-19 pandemic: a qualitative analysis of provider experiences and perspectives. *Telemed J E Health*. 2021;27(8):947–954. doi:10.1089/tmj.2021.0121
50. Sharma A, Sasser T, Schoenfelder Gonzalez E, Vander Stoep A, Myers K. Implementation of home-based telemental health in a large child psychiatry department during the COVID-19 crisis. *J Child Adolesc Psychopharmacol*. 2020;30(7):404–413. doi:10.1089/cap.2020.0062
51. Shklarski L, Abrams A, Bakst E. Navigating changes in the physical and psychological spaces of psychotherapists during Covid-19: when home becomes the office. *Practice Innovations*. 2021;6(1):55–66. doi:10.1037/pri0000138
52. Stancin T. Reflections on changing times for pediatric integrated primary care during COVID-19 pandemic. *Clin Pract Pediatr Psychol*. 2020;8(3):217–219. doi:10.1037/cpp0000370
53. Sugarman DE, Busch AB, McHugh RK, et al. Patients’ perceptions of telehealth services for outpatient treatment of substance use disorders during the COVID-19 pandemic. *Am J Addict*. 2021;30(5):445–452. doi:10.1111/ajad.13207
54. Talley RM, Brunette MF, Adler DA, et al. Telehealth and the community SMI population: reflections on the disrupter experience of COVID-19. *J Nerv Ment Dis*. 2021;209(1):49–53. doi:10.1097/NMD.0000000000001254
55. Tolou-Shams M, Folk J, Stuart B, Mangurian C, Fortuna L. Rapid creation of child telemental health services during COVID-19 to promote continued care for underserved children and families. *Psychol Serv*. 2022;19:39–45. doi:10.1037/ser0000550
56. Treitler PC, Bowden CF, Lloyd J, Enich M, Nyaku AN, Crystal S. Perspectives of opioid use disorder treatment providers during COVID-19: adapting to flexibilities and sustaining reforms. *J Subst Abuse Treat*. 2022;132:108514. doi:10.1016/j.jsat.2021.108514

57. Uscher-Pines L, Sousa J, Jones M, et al. Telehealth use among safety-net organizations in California during the COVID-19 pandemic. *JAMA*. 2021;325(11):1106. doi:10.1001/jama.2021.0282
58. Uscher-Pines L, Sousa J, Raja P, Mehrotra A, Barnett ML, Huskamp HA. Suddenly becoming a “virtual doctor”: experiences of psychiatrists transitioning to telemedicine during the COVID-19 pandemic. *Psychiatr Serv*. 2020;71(11):appi.ps.20200002. doi:10.1176/appi.ps.202000250
59. Waller G, Pugh M, Mulkens S, et al. Cognitive-behavioral therapy in the time of coronavirus: clinician tips for working with eating disorders via telehealth when face-to-face meetings are not possible. *Int J Eat Disord*. 2020;53(7):1132–1141. doi:10.1002/eat.23289
60. Yeo EJ, Kralles H, Sternberg D, et al. Implementing a low-threshold audio-only telehealth model for medication-assisted treatment of opioid use disorder at a community-based non-profit organization in Washington, D.C. *Harm Reduct J*. 2021;18(1). doi:10.1186/s12954-021-00578-1
61. Yue H, Mail V, DiSalvo M, Borba C, Piechniczek-Buczek J, Yule AM. Patient preferences for patient portal-based telepsychiatry in a safety net hospital setting during COVID-19: cross-sectional study. *JMIR Form Res*. 2022;6(1):e33697. doi:10.2196/33697
62. United States Drug Enforcement Administration. The controlled substances act. www.dea.gov. Available from: <https://www.dea.gov/drug-information/csa>. Accessed July 25, 2018.
63. DEA Diversion Control Division. Usdoj.gov. 2019. Available from: <https://www.deadiversion.usdoj.gov/>. Accessed March 5, 2024.
64. Zhao Y, Ni Q, Zhou R. What factors influence the mobile health service adoption? A meta-analysis and the moderating role of age. *Int J Inf Manage*. 2018;43:342–350. doi:10.1016/j.ijinfomgt.2017.08.006
65. Venkatesh V, Thong JYL, Xu X. Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology. *MIS Quarterly*. 2012;36(1):157–178. doi:10.2307/41410412
66. Kim HM, Xu Y, Wang Y. Overcoming the mental health stigma through m-health apps: results from the healthy minds study. *Telemed J E Health*. 2022;28(10):1534–1540. doi:10.1089/tmj.2021.0418
67. Vereenoghe L, Trussat F, Baucke K. Applying the technology acceptance model to digital mental health interventions: a qualitative exploration with adults with intellectual disabilities. *J Ment Health Res Intellect Disabil*. 2021;14(3):1–26. doi:10.1080/19315864.2021.1929597
68. Cao J, Kurata K, Lim Y, Sengoku S, Kodama K. Social acceptance of mobile health among young adults in Japan: an extension of the UTAUT Model. *Int J Environ Res Public Health*. 2022;19(22):15156. doi:10.3390/ijerph192215156
69. Rentrop V, Damerau M, Schweda A, et al. Predicting acceptance of e-mental health interventions in patients with obesity by using an extended unified theory of acceptance model: cross-sectional study (Preprint). *JMIR Form Res*. 2021;6(3). doi:10.2196/3122919
70. Kruse C, Heinemann K. Facilitators and barriers to the adoption of telemedicine during the first year of COVID-19: a systematic review (Preprint). *J Med Internet Res*. 2021;24(1). doi:10.2196/31752
71. Bender K, Wilson J, Adelman E, DeChants J, Rutherford M. A human-centered design approach to interdisciplinary training on homelessness. *J Soc Work Educ*. 2020;56(sup1):S28–S45. doi:10.1080/10437797.2020.1743218
72. Istepanian RSH. Mobile health (m-Health) in retrospect: the known unknowns. *Int J Environ Res Public Health*. 2022;19(7):3747. doi:10.3390/ijerph19073747

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