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Overcoming Clinician Technophobia: What We Learned from Our Mass Exposure to Telehealth During the COVID-19 Pandemic

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Abstract

Mental health clinicians have migrated to telehealth during the COVID-19 pandemic and have reported their use of telehealth may be permanent. Understanding how stakeholders overcame hesitancy regarding the use of telehealth can potentially reveal how stakeholders can adopt future clinical technologies. The exposure therapy conceptual framework provides one explanation of how mental health clinicians can face their concerns about technologies that promise to improve clinical outcomes and worker well-being. We review available literature published since the start of the pandemic on the extent to which clinicians migrated to telehealth and their reactions to their transitions. In particular, we review available literature that describes negative attitudes and worries by clinicians as one of many barriers of telehealth implementation. We introduce the perspective that the necessary transition to telehealth at the start of the pandemic functioned as an exposure exercise that changed many clinicians' cognitive and emotional reactions to the use of telehealth technologies. Next, we provide guidance on how clinicians can continue taking an exposure approach to learning emerging technologies that are safe and can benefit all stakeholders. Clinicians can now reflect on how they overcame hesitancy regarding telehealth during the pandemic and identify how to build on that new learning by applying strategies used in exposure therapy. The future of clinical work will increasingly require mental health clinicians to better serve their patient populations and enhance their own well-being by overcoming *technophobia*, a broad term for any level of hesitancy, reluctance, skepticism, worry, anxiety, or fear of implementing technology.

Keywords Technophobia · Exposure therapy · Telehealth · Future of work · COVID-19 · Pandemic · Technology integration · Technology acceptance

Mental health clinicians have migrated to telehealth during the COVID-19 pandemic and have reported their use of telehealth may be permanent (Békés & Aafjes-van Doorn, 2020; Dores et al., 2020; Sammons et al., 2020). The early phase of the pandemic inspired our field to disseminate best practices on how to adapt treatments to telehealth (Inchausti et al., 2020; Kazantzis et al., 2021), which included specific guidance for evidence-based protocols (e.g., prolonged exposure for posttraumatic stress disorder; Fina et al., 2021; Wells et al., 2020). Interestingly, however, telehealth has long been recognized as an effective modality for cognitive behavioral treatments (Batastini et al., 2021), so why did it take a pandemic to trigger this mass adoption?

Many barriers to telehealth implementation are rooted in policies and systems such as constraints in reimbursement and credentialing (Cowan et al., 2019) and added administrative and training burdens (Perry et al., 2020). However, in addition to external barriers, mental health clinicians report many beliefs, attitudes, and feelings about telehealth that may be inconducive for the adoption of these technologies. Recent reviews of barriers to telehealth indicate a central theme of clinician reluctancy (Cowan et al., 2019; Langarizadeh et al., 2017). Pre-pandemic, clinicians often reported concern about their technical competency, privacy, increased hassle, potential for technical issues, and the perception that telehealth is impersonal and inconducive to building therapeutic alliance and assessing nonverbals (Connolly et al., 2020; Pierce et al., 2020). When the pandemic increased demand to integrate telehealth into routine practice, clinicians had to grapple

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with their own perceptions and feelings about telehealth. One study found that, on average, mental health clinicians experienced a moderate level of anxiety about using telehealth during the pandemic and that those who had not previously used telehealth had higher levels of anxiety than those who had (Doorn et al., 2021). A large international survey found the majority of mental health clinicians during the pandemic were concerned with technical issues, quality of care, and responding to crises (Montoya et al., 2022). Another large survey found about 28% of mental health clinicians had negative feelings about telehealth prior to the pandemic and that these feelings decreased significantly after migrating to telehealth (Doran & Lawson, 2021).

Rather than using overt avoidance to cope with discomfort over telehealth, another option is to directly confront one's concerns by engaging with telehealth and any necessary training or administrative infrastructure. Evidence suggests that frequency of telehealth use increases comfort with telehealth and preference to use telehealth (Connolly et al., 2020). Exposure therapy is a helpful framework to understand how one can learn from engaging in uncomfortable situations. From the perspective of exposure therapy, the necessary transition to telehealth during the beginning of the COVID-19 pandemic may have functioned as an exposure exercise that changed cognitive and emotional reactions to telehealth technologies. In this paper, we share the perspective that the future of clinical work will increasingly require mental health clinicians to overcome *technophobia*, which we broadly define as any level of hesitancy, reluctance, skepticism, worry, anxiety, or fear of implementing technology in one's clinical practice (Khasawneh, 2018).

While the widespread adoption of telehealth has been an organic response to a global crisis, all clinicians could benefit from intentionally engaging with a myriad of technologies *at any time*. Collectively, the mental health field has demonstrated remarkable resourcefulness and innovation during the pandemic (Comer, 2021; Drude, 2021). Moving forward, however, clinicians will have opportunities to continue enhancing the impact of evidence-based practices through collaborating with and learning from technologists. This commentary was written by an interdisciplinary team representing clinical psychology, industrial-organizational psychology, information science, and human–computer interaction. We aim to help clinicians (1) reflect on how they overcame technophobia during the pandemic and (2) identify how to build on that new learning.

The Future of Clinical Work

The world of work is undergoing drastic technological change, which some have dubbed the *Fourth Industrial Revolution* (Schwab, 2016). Like previous industrial revolutions, technology is replacing tasks and jobs (e.g., Manyika et al., 2017; Semuels, 2020). Unlike previous industrial revolutions, however, technology (e.g., automation, machine learning, artificial intelligence) is not creating jobs that are at the same skill level as the jobs it is replacing (Jaimovich & Siu, 2020; Tschang & Mezquita, 2020). Modern computational solutions have stoked workers' fears about technology being unethical, uncontrollable, unintelligible, unfair, and even harmful to human survival (Li & Huang, 2020). It is important to recognize, however, that the integration of new technology will hold some benefits. Technology can automate repetitive manual and demanding tasks (Kadir et al., 2019), parse down complex and unorganized information (Gonzalez et al., 2019), provide feedback and guidance to facilitate learning (Mele et al., 2021), or even change the nature of work itself with workers working less but earning a living wage. Whether good or bad, technology will change the nature of work for *all* occupations — mental health work is no exception.

Technology is already changing mental health practices in profound ways (Reger, 2020). For instance, recent efforts have demonstrated that clinically relevant data can be detected by passive sensors on smartphones (Abdullah et al., 2016) and interventions can be delivered via chatbots (Daley et al., 2020; Lee et al., 2020). Clinical technologies that were previously regarded as "futuristic" are now ready for routine implementation (e.g., virtual reality environments made for exposure therapy; Sherrill et al., 2020). These new tools are products of clinicians and technologists working with and learning from each other. Computer scientists specializing in human–computer interaction are leading efforts to understand how clinicians can best use the contents of their digital toolboxes (Abras et al., 2004; Arriaga & Abowd, 2019). The most impactful technologies will result from an iterative design cycle that begins with understanding the user and the user's context and then continuingly evaluates prototypes against identified user requirements (Schertz et al., 2019). Technologists are also invested in designing tools that fit within patients' care ecologies and social networks (Evans et al., 2020, 2022). These efforts are guided by the possibility that technological solutions can enhance the experience and outcomes of all stakeholders in mental health work.

Technophobia

Technophobia is not a clinically significant phobia. Likewise, we do not suggest any level of hesitancy, reluctance, skepticism, worry, anxiety, or fear about clinical technologies is illogical or unwarranted. Rather, we use technophobia as a provocative term that invites clinicians to engage in honest self-reflection. *Are you avoiding technology based on your evaluation of the empirical research or your own worries about using it?* Understanding the attitudes

and intentions of clinicians is crucial to technological integration (Venkatesh et al., 2003) and will be vital to implementing best practices in future clinical work (Liu et al., 2015). The cost of technophobia is unhelpful avoidance of technological advances that may improve clinical outcomes and worker well-being. Preliminary evidence suggests that technophobia predicts less use of technology such as the internet (Nimrod, 2021) and wearables (Aksoy et al., 2020). Avoidance might result in short-term relief from technophobia-related discomfort but also long-term undesirable consequences stemming from missed opportunities.

Importantly, mental health clinicians may be especially vulnerable to technophobia because the training and practice of psychotherapy has seldom leveraged technology. Moreover, unlike some blue-collar jobs (e.g., truck drivers), most mental health clinicians do not currently view their skillset (e.g., intuition and empathy) as subject to replacement or supplementation by automation. Reducing emotional suffering is often seen exclusively as a job for humans. However, successful adoption of these technologies can potentially lead to a more productive and fulfilling clinical workplace by reducing routine work so that clinicians can focus on meaningful work activities. Today's clinicians will notice how the next generation of clinicians — Generation Z or "Zoomers" — will have grown up with advanced digital tools and thus may experience relatively lower levels of technophobia. These future clinicians may not only be trained to use technology but may be trained *by* technology — automated clinical session feedback systems promise to lead to more effective and personalized clinical skill acquisition (e.g., Imel et al., 2019). Today's clinicians who adopt state-of-the-art technologies will be more employable as tomorrow's patients request cutting-edge tools.

Using Exposure to Overcome Hesitancy

We believe clinicians can use exposure strategies to overcome technophobia. The widespread adoption of telehealth during the COVID-19 pandemic provides a case study in how clinicians are able to overcome hesitancy to learn new competencies. In March 2020, many clinicians learned that telehealth would be the only treatment delivery modality available. One study found that only 29% of clinical psychologists used telehealth for a portion of their caseload prior to the pandemic and, within weeks of the pandemic, over 80% of the sample reported using telehealth for nearly their entire caseload (Sammons et al., 2020). When faced with the necessity to use telehealth, some evidence suggests clinicians experienced negative feelings including anxiety (Doorn et al., 2021; Doran & Lawson, 2021). A qualitative study found about a quarter of the sample's clinicians described an initial negative and pessimistic reaction to their transition to telehealth, citing concerns about the quality of care and the ability to manage complex cases and crisis situations (Hersch et al., 2022). Importantly, however, during the rapid transition to telehealth, expectations of telehealth competency were tempered. Most stakeholders — patients, employers, organizations, managed care — allowed clinicians a grace period to adjust their practices and learn (Puspitasari et al., 2021). These conditions provided the opportunity for informal exposure exercises that resulted in adaptive changes in behavior and perspectives. Direct experience with telehealth resulted in reduced negative reactions to telehealth (Doorn et al., 2021; Doran & Lawson, 2021). Qualitative studies illustrated how clinicians faced their telehealth concerns during the pandemic and committed to behavior change that ultimately enriched the experience of their patients and themselves (Hersch et al., 2022; Uscher-Pines et al., 2020). Many clinicians reported that consistent exposure to telehealth resulted in favorable impressions and that remaining concerns are not about the technology but the extent to which systems could support its continued use (e.g., differential reimbursement rates and licensure restrictions; Lipschitz et al., 2022).

Unlike the global transition to telehealth, we expect that overcoming clinician technophobia concerning integrating other future technologies will require proactive action. In particular, strategies used in exposure therapy can provide proactive steps toward technological integration. The first step in taking an exposure approach is to validate one's hesitancy. In other words, one must acknowledge and understand their reactions before one can challenge their reactions. There are indeed valid reasons to experience concern and discomfort when confronting new technologies. For example, most new technologies will replace some labor, which has historically been met with stark resistance (e.g., striking against integration and sabotaging implementation; Carlopio, 1988). While not as severe, these reactions echo the responses of contemporary mental health clinicians who report concerns such as if technology will glitch, have biases, limit decision-making, and risk breaches of sensitive data (McClure, 2018).

The second step of the exposure approach is to generate a list of behavioral exercises (i.e., "exposures") that aim to (1) reduce unhelpful emotional responses to technology and (2) evoke helpful perspectives and behavioral flexibility. These exposures should target the specific technological stimuli and situations that elicit negative affect and corresponding avoidance. Additionally, some mental health clinician may benefit from engaging in a broad class of technologies to challenge overgeneralized beliefs (e.g., "I'm just not a tech person"). Ideas for general technology exposure include

reading about a new technology in one's clinical area, viewing live or recorded demonstrations of clinical technology, using wearables and progress trackers in one's own everyday life, volunteering for a research study on clinical technology, and using clinical technology with non-patients. After brainstorming a set of exposures, the list should be ranked in order of perceived difficulty. These lists should have several exposures at each level of difficulty: easy, moderate, hard.

The third step of the exposure approach is to engage in each item on the list, starting with more manageable tasks and then gradually progressing to more challenging tasks. We recommend the following tips for every technology exposure: (1) seek modeling and guidance from an experienced user, (2) engage slowly and deliberately, (3) learn one task at a time, (4) allow enough time to learn new information such observing that discomfort reduces over time and that one is more capable than originally thought, and (5) repeat the exposure until new adaptive information is learned.

To efficiently learn that technophobia exposure targets are indeed safe and manageable, we recommend following guidance from an evidence-based theoretical model of exposure therapy called *inhibitory learning* (Craske et al., 2014). The inhibitory learning model is applicable to a wide spectrum of anxiety content. This model aims primarily to help clinicians design and deliver effective exposures with patients. However, clinical guidelines informed by this model (e.g., Maples-Keller et al., 2022) can be adapted to help clinicians address their own discomforts. See Table 1 for evidence-based exposure guidelines for clinicians to overcome technophobia.

To illustrate how a mental health clinician can take an exposure approach to overcoming technophobia regarding future technologies, consider the integration of ubiquitous computing into therapy. Specifically, imagine a mobile app is developed that uses passive sensing to measure contextual variables in the patient's day-to-day life (e.g., geolocation, proximity to others, use of social media, tone of speaking voice, and heart rate). Despite the app's potential to improve patient-clinician communication, a clinician might respond to this technology with anxiety and experience worries that integrating the new app will risk privacy, feel intrusive, and overly "quantify" the patient's experience. After validating their own concerns, the clinicians can brainstorm the following exposures to potentially challenge their initial reactions (listed in ascending order of perceived discomfort): watch an academic presentation on the app, discuss worries with an

Table 1 Guidelines for using exposure to learn clinical technologies are safe and manageable

Inhibitory learning	Guideline using telehealth as an example
Expectancy violation	Prior to engaging in exposures, describe your expectations of your reactions to the technology and your performance. Design exposures that can test each of these expectancies. For example, one might expect that telehealth will result in diminished rapport. This expectancy can be tested after completing several sessions with a patient in which usual rapport-building strategies are used
Deepened extinction	Before using the entirety of a new technology, you can first break apart the task into smaller components and then use them all together. For example, one can use telehealth technologies with colleagues prior to using it with a patient. The clinician can start with basic tasks (e.g., maintaining a conversation) and then engage in more complex tasks (e.g., screen sharing). After the clinician is comfortable using the equipment with a nonpatient, an exposure with patients may seem more manageable
Reinforced extinction	Given that technological glitches happen and clinicians need to respond to glitches while maintaining therapeutic interactions, you can design exposure exercises in which occasional problems are likely to arise. For example, to learn how to use telehealth while the patient is engaging in a public space, the clinician can practice communicating with colleagues over smartphone-based telehealth technologies with the intention of testing the limits (e.g., maintaining conversations while walking into buildings)
Removal of safety signals	To learn the technology is safe, you will benefit from disengaging in the use of self-soothing thoughts and behaviors. For example, when engaging in telehealth exposures, the clinician should not engage in soothing behaviors out of the camera's view such as placing a blanket on their lap, fidgeting below the desk, or looking away from the patient. These behaviors might not be detected by the patient but send messages to oneself that the technology is unsafe or intolerable
Multiple contexts	To prevent learning a technology is only safe and manageable under certain conditions, you can repeat similar exposures within varying contexts that are objectively safe. For example, a clinician can choose to use telehealth with a variety of devices (e.g., laptops, tablets, and smartphones) and physical locations (e.g., office, home, and outdoors)
Stimulus variability	To prevent learning a technology is only safe and manageable with certain types of patients and therapies, you can repeat similar exposures within varying therapeutic targets. For example, a clinician can choose to use telehealth with a wide range of patients (e.g., tech-savvy teenagers and seniors with limited computer experience) and protocols (e.g., motivational interviewing and interoceptive exposure)
Retrieval cues	Select neutral stimuli for exposures that later retrieve memories that the technology is safe. For example, in the case of telehealth, a clinician can customize their physical or virtual backdrop with individualized stimuli that provide a sense of familiarity and comfort (e.g., a small bookshelf with one's own books)

experienced user of the app, ask for a demonstration of the app, use the app in one's own person life, use parts of the app that seem manageable with patients who seem tech-savvy and highly willing, use various parts of the app with various patients, and use the entire app with any clinically indicated patient. As the clinician gradually progresses through this exposure hierarchy, they can record their insights including any violations to previous worries. The end point of these exposures is when the clinician experiences increased comfort and balanced perspectives about the technology that are based on their actual lived experience with the technology, not just their initial appraisal.

Future Research

Historically, mental health treatment has not required technology in learning or delivering evidence-based practice. However, relying solely on human-to-human interactions can limit the scalability of clinician training and patient access. The mental health workforce is primed for a fundamental transformation in which clinicians, trainers, and organizations embrace emerging technologies to increase efficacy, reach, and worker well-being. While the COVID-19 pandemic provided an impetus for clinicians to overcome telehealth hesitancy, technophobia may continue to obstruct future technologies. The development of new digital tools will benefit from all stakeholders engaging in all stages of design and implementation.

We need to know more about technology design principles that will enhance user acceptance and optimize engagement by mental health clinicians. Additionally, effective implementation of clinical technologies needs to be guided by an understanding of clinical work settings. We need to not just know more about clinician- and organizational-level barriers to technological integration (e.g., technophobia) but potential facilitators to integration (e.g., prior exposure to effective tool use). One possibility to explore is the extent to which generational differences impact hesitancy to adopt clinical technologies. Current graduate students in their early- to mid-20s, for example, grew up using considerably more digital media than all previous generations (Twenge et al., 2019). Understanding cohort effects on reactions to clinical technologies can potentially facilitate implementation efforts. One possibility is that clinician technophobia can contribute to a "digital divide" within the mental health field — that is, socioeconomical disparities resulting from not using or having access to contemporary digital technologies. While a digital divide has emerged within education during the pandemic (McClain et al., 2021), largely unknown are disparities that have resulted from mental health networks that have been unable or unwilling to adopt telehealth.

We recommend three broad future research aims to better understand the future of work in mental health. First, future research should develop and test risk-mitigation frameworks on how to integrate new technologies into the workplace. Second, future research should seek to understand competencies clinicians need to better interact with and learn from new technologies. And third, future research should seek to better understand how fundamental changes of the job may affect clinicians' self-worth and mental well-being.

Conclusion

During the COVID-19 pandemic, individual clinicians learned how to use telehealth technologies. These technologies were not new (Batastini et al., 2021; Comer, 2021; Drude, 2021). Rather, conditions conducive for learning through exposure were new. The entire mental health field has an opportunity to build upon this lesson of overcoming barriers in the narrow domain of telehealth. Clinicians can continue taking an exposure approach to learning emerging technologies that have the potential to change the clinical landscape and benefit all stakeholders. Clinicians and technologists will mutually benefit from further interaction. Just like clinicians, technologists have been responsive to obstacles presented by the pandemic (Ong et al., 2021). One silver lining to the tragedies of the pandemic has been a giant step forward in realizing the potential of technology to enhance the reach of mental health treatment. While many barriers to adopting clinical technologies have existed for many years and some barriers will continue to persist, clinicians can now build off the insight that they can indeed overcome their concerns and worries with behavioral commitments and intentions to adapt.

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Declarations

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