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Title

Implementation strategies for digital mental health interventions in health care settings.

Permalink

<https://escholarship.org/uc/item/7nf4d1mg>

Journal

The American psychologist, 75(8)

ISSN

0003-066X

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Publication Date

2020-11-01

DOI

10.1037/amp0000686

Peer reviewed

Implementation Strategies for Digital Mental Health Interventions in Health Care Settings

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U.S. health care systems are tasked with alleviating the burden of mental health, but are frequently underprepared and lack workforce and resource capacity to deliver services to all in need. Digital mental health interventions (DMHIs) can increase access to evidence-based mental health care. However, DMHIs commonly do not fit into the day-to-day activities of the people who engage with them, resulting in a research-to-practice gap for DMHI implementation. For health care settings, differences between digital and traditional mental health services make alignment and integration challenging. Specialized attention is needed to improve the implementation of DMHIs in health care settings so that these services yield high uptake, engagement, and sustainment. The purpose of this article is to enhance efforts to integrate DMHIs in health care settings by proposing implementation strategies, selected and operationalized based on the discrete strategies established in the Expert Recommendations for Implementing Change project, that align to DMHI-specific barriers in these settings. Guidance is offered in how these strategies can be applied to DMHI implementation across four phases commonly distinguished in implementation science using the Exploration, Preparation, Implementation, Sustainment Framework. Next steps to advance research in this area and improve the research-to-practice gap for implementing DMHIs are recommended. Applying implementation strategies to DMHI implementation will enable psychologists to

Editor's note. This article is part of a special issue, "Expanding the Impact of Psychology Through Implementation Science," published in the November 2020 issue of *American Psychologist*. Shannon Wiltsey Stirman and Rinad S. Beidas served as editors of the special issue, with Anne E. Kazak as advisory editor.

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This work was supported by grants from the National Institutes of Health (K01 DK116925; K08 MH112878; K01 MH113806; R01 MH100482; R01 MH111610, K23 MH110602, R56 HL148192, & DA027828). Byron J. Powell, Aaron R. Lyon, Justin D. Smith, Stephen M. Schueller, and Nicole A. Stadnick were fellows of the Implementation Research Institute (IRI) at the Brown School at Washington University in St. Louis through an award from the National Institute of Mental Health (R25 MH080916) and the Department of Veterans Affairs, Health Services Research & Development Service, Quality Enhancement Research Initiative (QUERI). David C. Mohr, has accepted honoraria and consulting fees from Apple, Inc., Otsuka Pharmaceuticals, and has an ownership interest in Adaptive Health, Inc. Stephen M. Schueller has received consulting fees from Otsuka Pharmaceuticals and research funding from One Mind for the operation and leadership of One Mind PsyberGuide.

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systematically evaluate this process, which can yield an enhanced understanding of the factors that facilitate implementation success and improve the translation of DMHIs from controlled trials to real-world settings.

Public Significance Statement

This article presents a compilation of implementation strategies (i.e., methods and techniques) to address specific challenges to implementing digital mental health interventions in health care settings, as well as a research agenda to address the research-to-practice gap for implementing these services.

Keywords: digital mental health, health care, implementation science, implementation strategies

Supplemental materials: <http://dx.doi.org/10.1037/amp0000686.supp>

In the United States, the 12-month prevalence of mental health problems is nearly 20% in adults and 16.5% in youth (Substance Abuse and Mental Health Services Administration, 2018; Whitney & Peterson, 2019). Yet, fewer than half of those with mental health needs receive treatment, with significant variation in unmet treatment need by geographic region (Whitney & Peterson, 2019). Health care systems are tasked with addressing these problems, but frequently are underprepared and lack workforce and resource capacity to deliver services to all in need.

Digital mental health interventions (DMHIs) offer an exciting solution to increase access to mental health services, by supporting existing services (e.g., augmenting traditional services) or providing new services to those in need. DMHIs use online and/or mobile formats to deliver psychological strategies and interventions. DMHIs can range from self-guided tools to facilitate a skill or behavioral strategy (e.g., track activity or mood, self-monitor eating behaviors, increase relaxation/practice meditation), to more complex and comprehensive psychological interventions (e.g., cognitive-behavioral therapy [CBT] for depression). Human support (“coaching”) may or may not accompany the intervention (referred to as guided vs. unguided interventions, respectively). Innovations are advancing DMHIs, such as by using artificial conversational agents (“chatbots”) to deliver support, delivering virtual/augmented reality interventions or digital interventions for families and groups, and integrating passively collected sensor data.

Technology can enhance or enable the delivery of mental health services at various points of when care can be provided: while individuals are waiting to receive in-person psychological services, in place of in-person services, as a treatment adjunct while receiving services, and/or after treatment to prevent relapse. There are merits to using different DMHIs for different intervention purposes. Self-guided tools that focus on a specific component of treatment (e.g., self-monitor, track symptoms, practice a particular

skill) can be useful adjuncts to treatment by extending content from treatment to day-to-day practice and making it easier for individuals to engage with that component between sessions. By contrast, guided or unguided DMHIs could be an alternative to in-person psychological services, in which treatment is delivered via technology. Meta-analyses of Internet-delivered CBT have shown equivalent overall effects with face-to-face treatment for psychiatric and somatic disorders (Andersson, Cuijpers, Carlbring, Riper, & Hedman, 2014; Carlbring, Andersson, Cuijpers, Riper, & Hedman-Lagerlöf, 2018). Further, meta-analyses of mobile interventions for depression and anxiety show moderate average effect sizes of 0.38 and 0.33, respectively, compared with control conditions (Firth, Torous, Nicholas, et al., 2017; Firth, Torous, Nicholas, et al., 2017). Providing human support with a DMHI can enhance adherence and outcomes (Baumeister, Reichler, Munzinger, & Lin, 2014; Richards & Richardson, 2012).

Though using technology as an adjunct to psychotherapy can support mental health service delivery for those already receiving treatment, this article focuses on delivering guided or unguided DMHIs in place of in-person specialty mental health services. This latter approach extends new services to those not receiving care and can increase access to practitioners by conserving time to deliver in-person services; thus, enabling health care settings to deliver mental health services to more people in need. However, for practitioners to successfully use DMHIs in their practices, DMHIs have to be embedded in the workflows and tools they regularly use (Greenhalgh et al., 2017). By design, mental health services delivered as a DMHI differ from in-person psychotherapy, which means that DMHIs do not directly fit into traditional workflows. As a result, successful examples of integrating DMHIs into health care settings have not been consistently demonstrated: when DMHIs have moved from controlled trials to real-world settings, low uptake and engagement is common, and the tools are abandoned (Greenhalgh et al., 2017; Mohr, Lyon, Lattie,

Reddy, & Schueller, 2017). The challenges of translating DMHIs from research to practice suggest more systematic approaches are needed to guide this process.

Implementation science is an emerging, rapidly growing field that has established theory, frameworks, methods, and strategies to enhance uptake and sustainability of innovations in real-world settings. Specific to DMHI implementation, there has been great progress in identifying facilitators and barriers (see Table 1 and associated references in online Supplemental Materials 1), establishing frameworks to predict and evaluate the success of patient-facing health care technologies (e.g., the Nonadoption, Abandonment, Scale-up, Spread, and Sustainability framework; Greenhalgh et al., 2017), and defining implementation outcomes (Hermes, Lyon, Schueller, & Glass, 2019). However, there remains a

gap in knowing the methods and techniques (i.e., “implementation strategies;” Powell et al., 2012, 2015; Proctor, Powell, & McMillen, 2013) for implementing a DMHI in health care settings. In general, adoption of an evidence-based service needs to be accompanied by an evidence-based approach to implementation (Grol & Grimshaw, 1999). Implementation strategies offer testable, replicable techniques to guide implementation, with growing evidence supporting their use (Cochrane Collaboration, 2013; McMaster University, 2012; Powell et al., 2019). Yet, to our knowledge, few implementation strategies specifically for implementing DMHIs in health care settings have been proposed (Anton & Jones, 2017; LaMonica et al., 2019; MasterMind, 2017) and fewer tested and disseminated. Because psychologists are often tasked with implementing or

Table 1

Common Barriers and Facilitators for Implementing Digital Mental Health Interventions in Health Care Settings That Have Been Documented in Published Reviews and Proposed Implementation Strategies

Common barriers	
<ul style="list-style-type: none"> • Stigma associated with mental health and help seeking • Preference for traditional delivery of face-to-face care • Concerns with confidentiality, privacy, and data breaches • Discomfort with or feeling incapable of using technology • Complexity of the technology or intervention • Mobile compatibility issues and interoperability with other systems • Low digital literacy or awareness of DMHIs • Limited research evidence for the DMHI • Nonadherence and attrition 	<ul style="list-style-type: none"> • Organizational barriers (e.g., scheduling problems) • No available technical support • Limited staff resources and staff turn-over • Lack of cultural and ethnic diversity • Financial costs (e.g., reimbursement, start-up costs) • Practitioners' negative attitudes towards DMHIs • Practitioners' resistance to changes • Practitioners' perceived negative impact on consumer safety
Common facilitators	
<ul style="list-style-type: none"> • Advancements in technologies and quality of care • Guidance from a health professional • Enhancement of the therapeutic relationship/alliance • Social support from online forums or groups, peer counseling • User access and convenience • Availability of online resources and text reminders • Consumer-centric tools and features 	<ul style="list-style-type: none"> • Availability of developers • Technical equipment and resources for implementation • Liaisons to bridge cultural gaps • Strong organizational leadership • Standardized measures • Maximum security, trust in and credibility of the DMHI • Funding, lower costs, or cost analyses
Proposed implementation strategies across phases of implementation ^a	
Exploration phase	
<ul style="list-style-type: none"> • Conduct needs assessments (e.g., among practitioners, consumers) • Align practitioners on DMHI adoption (e.g., consensus discussions) 	<ul style="list-style-type: none"> • Review DMHI evidence and content • Aim to ensure equity in who can access the DMHI
Preparation and Implementation phases	
<ul style="list-style-type: none"> • Create a business associate agreement to restrict data usage • Determine who is appropriate for the DMHI, and create guidelines • Create and distribute educational materials about the DMHI • Be transparent about DMHI data security, privacy, and use • Assist with onboarding (e.g., educational materials, point-person) • Create and disseminate practice guidelines for delivering the DMHI • Offer training and ongoing supervision in using the DMHI • Specify plans for monitoring and addressing safety concerns • Change record systems (e.g., integrate the DMHI with the health record; integrate the communication portal with tools practitioners use) • Appropriate sufficient funds (e.g., to license the DMHI, initiate a contract, workflow integration, programming, and staff training) • Build partnerships for priority setting and evaluation 	<ul style="list-style-type: none"> • Adopt DMHIs with demonstrated effectiveness • Design the referral process and inform referring practitioners • Have “champions” inform consumers about the DMHI • Be transparent about DMHI requirements, promote autonomy • Make technical assistance available • Ensure practitioners are competent to deliver the DMHI • Monitor practitioners' fidelity to the DMHI protocol • Make plans for safety monitoring transparent to consumers • Conduct small tests of the new processes
Sustainment phase	
<ul style="list-style-type: none"> • Optimize the technologies and implementation plans over time 	<ul style="list-style-type: none"> • Track time and resources spent implementing the DMHI • Create learning collaboratives to share resources and learnings • Assess changing needs and preferences over time

Note. DMHI = digital mental health intervention. References associated with each barrier and facilitator are in online Supplement Materials 1.

^a These four phases are from the Exploration, Preparation, Implementation, Sustainment (EPIS) Framework.



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managing the implementation of new mental health services, for which DMHIs could be an attractive option, they need to be equipped with strategies that can guide DMHI implementation. Though some psychologists may heavily use DMHIs whereas others may be limited (e.g., depending on who they treat, practice characteristics), there is value in understanding the scope of work to support this process.

The aim of this article is to enhance efforts to integrate DMHIs into health care settings that deliver mental health services by proposing a compilation of implementation strategies specific to DMHIs across different phases of implementation. The focus is on organization-level implementation of a DMHI (e.g., across a clinic(s), with a recurring budget line), rather than on DMHI adoption and delivery among individual practitioners, to account for organizational and contextual factors that impact sustained implementation of DMHIs in health care settings. Given that many discrete implementation strategies have been described for implementing innovations in general (Powell et al., 2019, 2015), this article presents a distilled compilation of these strategies and offers guidance in how they can be applied to DMHI implementation. Yet, because the proposed strategies for DMHIs are primarily guided by theory and not empirical support for DMHI implementation, the article closes with an agenda to propel future research.

Selecting Strategies for DMHI Implementation

The Expert Recommendations for Implementing Change (ERIC) project established a compilation of 73 discrete implementation strategies through consensus among implementation and clinical practice experts (Powell et al., 2015).



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Using the ERIC compilation, implementation strategies for DMHI implementation were selected and operationalized to address DMHI-specific barriers in health care settings; this process occurred via narrative review followed by an iterative group consensus-building approach among the authors. In the sections that follow, the implementation strategies are described as they could be applied to DMHI implementation and for their relevance across four phases commonly distinguished in implementation science using the Exploration, Preparation, Implementation, Sustainment (EPIS) Framework (Aarons, Hurlburt, & Horwitz, 2011; Moullin, Dickson, Stadnick, Rabin, & Aarons, 2019). Table 1 presents a summary of the proposed implementation strategies that are presented in this article.

For this article, a DMHI is the “evidence-based service” to which implementation strategies are suggested be applied. “Health care settings” are organizations with a mental health service in their practice. “Consumers” are the individuals who receive mental health services via the DMHI. “Practitioners” are the individuals who provide mental health services. Rather than referring only to psychologists, a broader term is used, as a range of practitioners provide mental health services in health care settings and can be trained to deliver a DMHI.

Strategies for DMHI Implementation in Health Care Settings

Exploration Phase Strategies

The exploration phase of implementation refers to the period when a setting considers whether to adopt an



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evidence-based service based on the needs of those in the setting (Moullin et al., 2019). Several factors can impact the decision to implement a DMHI and which one to adopt, such as alignment between the treatment needs of the setting and mental health problem(s) targeted by the DMHI, evidence supporting its efficacy, acceptability, and usability by consumers and practitioners (e.g., likelihood the DMHI will meet consumers' needs and integrate into practitioners' workflow), and the cost to implement it in the setting (discussed in a later section).

Because many DMHIs are problem-specific, selecting a DMHI may require consensus among practitioners and administrators about which mental health problem(s) to target. The decision could be informed by assessing consumer-practitioner needs in that setting. For example, it may be helpful to adopt a DMHI that would address the most prevalent mental health problem facing the setting to reduce some burden for in-person services across practitioners. Alternatively, settings may benefit from adopting a DMHI that targets a less common problem but for which practitioner capacity to meet the demands of in-person services is limited. Once there is consensus on which problems to target, several DMHIs may be appropriate. Selection should be informed by reviewing the evidence and content for the DMHIs, as consumers and practitioners can have varying knowledge of these tools and their evidence (see Table 1).

The decision to adopt a DMHI also may be informed by ensuring the DMHI would be acceptable to consumers and practitioners in the setting. Before adoption, settings may engage with consumers to ensure they are willing and able to use this type of service. There are many reasons doing so may be indicated. For one, consumers may not be familiar

with, interested in, or willing to use technology to receive mental health services. Because familiarity with a DMHI is associated with greater acceptance (Vis et al., 2018), it is ideal for consumers to understand what a DMHI entails and how it differs from other mental health services. Concerns about privacy, data breaches, and the types and amount of digital data trails created by DMHI use (Gandhi & Wang, 2015; Proudfoot et al., 2010; Shilton, 2009; Torous & Roberts, 2017) may make consumers reluctant to engage with a DMHI. Consumers also can be concerned about increased screen time that results from using a DMHI or the amount of time they spend using certain apps (e.g., Baumer et al., 2013; Ko et al., 2015); this may be particularly salient to parents of youth given growing attention to limiting screen time (Council on Communications and Media, 2016). The mode of DMHI delivery (e.g., online, mobile) can affect access, in that not all consumers have a smartphone, regular access to the Internet, adequate storage capacity on their smartphone for new apps, or a cellular plan (e.g., phone, text message, or data capacities) that would align with the DMHI. A DMHI may not be ideal for consumers who share devices with others.

If a DMHI includes support from a practitioner, the communication medium for the DMHI needs to be one that consumers can and would likely use. In 2018, only 35 and 29% of U.S. consumers communicated with a health care provider via e-mail or the Internet, or by text message, respectively (Office of the National Coordinator for Health Information Technology, 2018). Security limitations may also limit the acceptability of DMHI communication. For example, a DMHI may include text messaging, but in the United States, sharing identifiable health information



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through text messaging and e-mail are subject to ongoing debate related to policy guidelines around privacy, which are often not specific (Drolet, 2017; Freundlich, Freundlich, & Drolet, 2018). As a result, health care settings may require that messages be delivered through hospital-approved messaging sites (e.g., MyChart, an online consumer-facing tool that can facilitate consumer-practitioner communication within the Epic electronic health record [EHR]). However, consumers may not be interested in using such tools to receive mental health services.

Given these considerations, relevant implementation strategies that settings might pursue are to conduct a local needs assessment with consumers to determine whether the DMHI is relevant to their needs and preferences, such as by convening focus groups, conducting a survey, or through informal discussions, and to learn how a DMHI aligns with consumers' existing perceptions of mental health services. Insights derived from these activities could inform the creation and distribution of educational materials about the DMHI and the decision to have "champions" available who can talk with consumers about the DMHI or provide testimonials.

Settings may also benefit from engaging with the practitioners who deliver mental health services to ensure they are willing and able to deliver this type of service. Practitioners have been wary about the safety of DMHIs and their appropriateness for various consumers (Topooco et al., 2017), leading to varying perceptions of the benefits and risks of this type of service. Practitioners may also be concerned about what data are captured by the DMHI and whether the privacy and security of the DMHI aligns with regulations in

their health care setting (Hermes, Burrone, et al., 2019). Thus, implementation strategies may include aligning practitioners on the advantages of implementing the DMHI (e.g., Quanbeck, 2019) and providing information about data security protections for the DMHI, such as by conducting local consensus discussions and educational meetings, as well as offering presentations about and demonstrations of the DMHI.

Preparation Phase and Implementation Phase Strategies

Once adopted, several activities are needed to prepare for and implement the service (Moullin et al., 2019). For a DMHI, delivery needs to be compatible with other mental health services, meaning the DMHI must fit into the standard workflows of the setting so that practitioners and consumers actually use it. Several strategies are relevant to achieve this goal. First is to design how the DMHI will be integrated within the delivery of other mental health services. Consumer identification, referral, and onboarding to the DMHI are the initial steps. Like referrals to psychotherapy, settings need to determine which consumers are appropriate for the service, how these consumers will be identified, and whether it would be useful to create a set of guidelines that help practitioners make decisions about which consumers could be offered the DMHI. Such decisions should be guided by available literature on the populations for whom the DMHI has demonstrated efficacy, as well as factors like consumers' interest and capacity to engage with the DMHI and the availability of other services. Questions may need to be added to intake assessments to determine consumers' appropriateness for a DMHI, such as whether they have access to the device through which the DMHI is delivered.

After guidelines are established about who is appropriate for the service, a next step is to design the referral structure for directing consumers to the DMHI. Strategies include determining who in the setting can refer consumers to the DMHI (e.g., practitioners in nonpsychology or behavioral health specialties, or only those responsible for delivering or managing mental health services), making referring practitioners aware of the DMHI and the types of relevant consumers who are appropriate for the DMHI (e.g., through presentations or educational materials), and defining the procedures for referring consumers (such as by creating an order in the EHR).

There are several considerations for the delivery of the DMHI, and implementation strategies can support the process. First is offering the DMHI as a treatment option to consumers. As part of making consumers aware of this treatment, they ideally would be provided with information about the privacy and security features of the DMHI so they can make an informed decision about this treatment option.



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This includes making consumers aware of what data practitioners can access from the DMHI and what data are stored in their health record, as consumers' level of comfort can vary by these domains (Nicholas et al., 2019). The types of information from the DMHI that are made visible to practitioners may affect consumers' interest in engaging with a DMHI. For example, some DMHIs only show practitioners the consumers' use data (e.g., number and duration of log-ins) without showing consumers' inputs into the DMHI (e.g., content from interactive activities); some consumers may prefer this anonymity, whereas others may desire more practitioner engagement and feedback. Distributing educational materials and having "champions" available are strategies that could support data transparency.

Consumers who are referred to and interested in receiving mental health services via the DMHI then need to onboard to the service by getting access to the technology. In addition to specifying how consumers will receive access to the DMHI (e.g., by receiving a link to the online platform, direct download from the app store), it may be important to help ensure consumers actually access the service on their device, as the onboarding process can incur challenges. For example, related to mobile DMHIs, people forget their password to the app store, they do not have enough space on their phone for another app, or their smartphone has an older operating system that cannot support the DMHI. To enhance the process by which consumers initiate the DMHI, settings may benefit from distributing educational materials and/or specifying a point person(s) who can monitor and offer assistance as consumers initiate the service.

Once consumers begin the DMHI, practitioners may want or need information relayed back to them so they can

monitor consumers' DMHI engagement and outcomes. Practitioners also need to understand how to utilize DMHI data to inform other aspects of consumers' care. Without guidelines, practitioners do not know how to utilize these data (e.g., Mayora et al., 2013). Settings may need to create and disseminate practice guidelines for delivering the DMHI that indicates the frequency by which practitioners should monitor DMHI use and outcomes, how consumer compliance is defined (e.g., daily log-in, weekly), what outcome is considered successful for completing the DMHI, and what to do in the event of noncompliance. Further, practitioners need training and ongoing supervision in using the DMHI (Lattie et al., 2019). Training practitioners can help them not only build skills needed to integrate the DMHI into their practices, but also to understand the key features of such tools (Armstrong, 2019). Indeed, many practitioners do not use the full range of features available to them when provided a DMHI (Reger et al., 2017), such that increasing knowledge of key features can enhance practitioners' ability to improve treatment processes. Moreover, as technology advancements can enable data integration from multiple sources and, thus, be used in conjunction with or integrated into a DMHI to support consumers' mental health services, practitioners may benefit from knowing how to leverage multiple technology-enabled data sources to enhance consumers' care.

However, if monitoring consumers' DMHI use and tracking outcomes is challenging for practitioners to do and misaligned with their workflow, they will stop using the DMHI to deliver services. The ERIC project recommends changing record systems for this purpose (Powell et al., 2015); for DMHIs in health care settings, this means integrating with the EHR, as EHRs are used by nearly 90% of office-based physicians in the United States (Office of the National Coordinator for Health Information Technology, 2016). Integrating the DMHI within the EHR is key because it aligns management of the DMHI with the workflows and tools that practitioners typically use, enables them to more effectively use the DMHI to inform other aspects of DMHI users' care, and improves their ability to efficiently manage both DMHI and non-DMHI users. Ideally, data transmission between the DMHI and EHR would be automated, and this could be achieved by convening stakeholders (e.g., practitioners using the DMHI, health information technology [IT] staff, DMHI programmers) to design how and where data from the DMHI are transmitted into the EHR and appropriating funds to support this work. Because aligning EHR settings with practitioners' workflow can be challenging (e.g., Graham et al., 2020), settings might also conduct small tests of the new processes to identify any glitches in the technologies and workflow before the DMHI is fully made available to consumers across the organization. For settings that do not use an EHR or for whom the cost to change the EHR precludes DMHI integration, setting might



Nicole A. Stadnick

need to monitor whether it is feasible and sustainable to track data outside of the EHR or to have someone manually enter data from the DMHI into the EHR, respectively. Ultimately, though, given the very high rates of EHR use in the United States, automating this process may prove to be the best strategy for practitioners' sustained use of a DMHI.

Finally, DMHIs that include practitioner support (i.e., guided interventions) need further attention. DMHI interactions are remote, may not occur in real time, and may be more frequent than once weekly. For example, interventions with text messaging may have several interactions in a week to support a single conversation. Depending on how the DMHI should be delivered (e.g., when and how often practitioners initiate contact with consumers, expectations for how quickly practitioners should respond to consumers), the workflow for DMHI communication may not align with traditional psychological services. As with data monitoring, misalignment with workflow can make it hard for practitioners to engage with the DMHI. To mitigate this barrier, settings may adopt different implementation strategies for DMHI delivery. For settings in which practitioners will deliver traditional mental health services and DMHIs, it may be helpful (and/or necessary depending on security regulations) to integrate the DMHI's communication portal with other tools practitioners already use (e.g., secure messaging via the EHR rather than a DMHI-specific communication portal) so practitioners can efficiently move between DMHI and non-DMHI workflows. However, as described with data integration, there may be limitations around integrating the DMHI into the settings' existing tools; in these instances, it may be important to monitor the feasibility for practitioners to use a DMHI-specific commu-

nication portal alongside delivering other mental health services. Alternatively, settings may create a new role and workflow specifically for DMHI delivery and hire practitioners for this role.

Sustainment Phase Strategies

Sustaining an innovation in practice means that it continues to be delivered and derives benefit, and that there is capacity to support its delivery without the support of those who introduced it (Urquhart et al., 2020). Achieving and maintaining this outcome requires ongoing adaptation so that it remains appropriate for the setting (LaMonica et al., 2019; Mohr, Cheung, Schueller, Hendricks Brown, & Duan, 2013; Urquhart et al., 2020). Because both technologies and settings change over time, the technologies and implementation plans that support DMHI delivery may benefit from iterative evaluation and optimization (Mohr et al., 2017).

As with any innovation, adaptations for DMHI implementation could be informed by engaging with consumers and practitioners to understand how these services meet their needs and the "pain points" that impede their use and implementation in the setting. Several data sources could inform this work, such as passively collected DMHI use data, logged contacts with the care system, or feedback via self-report questionnaires, interviews, or informal discussions. Capturing a range of perspectives is likely helpful (e.g., consumers with high and with low engagement with the DMHI, practitioners who delivered and did not adopt the DMHI). It may also be important to engage other individuals within the organization, such as administrators, to understand how the DMHI fits within the broader infrastructure, policies, and regulations of the setting and health care system. DMHI programmers and health IT staff may need to be engaged to determine what technology updates are possible given time and cost constraints.

Considerations for DMHI Across Implementation Phases

Ethical Considerations

When considering DMHI implementation in health care settings, it is important to be mindful of ethical considerations around the use of these tools, as these can impact the decision to adopt a DMHI and how it is delivered. Many facets of the *Ethical Principles of Psychologists and Code of Conduct* (American Psychological Association, 2002, 2016) relate to DMHI use.

One consideration is the General Principle of Justice (Principle D) in service delivery and avoiding inadvertent unfair discrimination (Ethics Code of Conduct Section 3.01 Unfair Discrimination). While 81% of U.S. adults own a smartphone, rates of smartphone ownership vary across



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demographic factors including age, race, ethnicity, income, and urban/rural residence (Pew Research Center, 2019). Among smartphone owners, differences in data plans, phone and messaging plans, and storage capacity can limit who can access a DMHI. Given that a goal of DMHIs is to expand access to care, settings might assess and monitor whether DMHI adoption widens disparities in treatment access rather than shrinks them. When deciding between different DMHIs that could be adopted, practitioners might consider the level of health (and digital health) literacy required to use the DMHI, and whether this creates barriers for consumers in that setting.

Discussed earlier was the importance of promoting transparency around data privacy and sharing so consumers can make informed decisions about receiving mental health services via a DMHI (Sections 4.01 and 4.02, Maintaining & Discussing the Limits of Confidentiality). Though a recent report revealed that data sharing with third parties is not consistently disclosed in popular DMHI apps, including among apps with a privacy policy (Huckvale, Torous, & Larsen, 2019), such practices would be prevented for DMHIs governed by a business associate agreement with the health care setting (or Institutional Review Board-approved protocol when implemented for research), which would restrict how data can be used. With that said, though consumers routinely rely on health care organizations to manage the privacy of their data, consumers still should be able to access a privacy policy that describes the use and limits to their DMHI data. Practitioners also should aim to be clear about what treatment options may be indicated and concurrently available so consumers are empowered in deciding to initiate treatment via a DMHI versus other modal-

ities. These factors reinforce using strategies like disseminating educational materials or embedding clinical champions to support implementation.

Relatedly, it can be helpful for consumers and practitioners to understand what activities within the DMHI are required for its use, as DMHIs have been criticized for designs that limit autonomy such as through prescriptive behavior change goals (Baumer et al., 2012; Cordeiro et al., 2015; Purpura, Schwanda, Williams, Stubler, & Sengers, 2011). In traditional psychotherapy, consumers can indicate when they are not comfortable with or interested in doing certain activities, and collaboratively discuss a treatment plan with their practitioner. By contrast, a DMHI may have no or few “opt-out” options, which could lead consumers to abandon the DMHI. Facilitating consumer autonomy when possible and/or being transparent about DMHI requirements may help to increase patients’ trust and comfort with this treatment modality, and aligns with the General Principle of Respect for People’s Rights and Dignity (Principle E).

From the DMHI delivery side, upholding the General Principle of Beneficence and Nonmaleficence (Principle A) means that health care settings will strive to adopt DMHIs with demonstrated effectiveness, and for which their practitioners have competence to deliver (Section 2.01 Boundaries of Competence). Competence in delivering a DMHI means that, in addition to understanding the psychological tenets of the service, practitioners understand the technology and its functionality, as well as feel a sense of self-efficacy about using it (Lattie et al., 2019). A study of Internet-delivered CBT showed that nearly 20% of questions that users ask DMHI practitioners focus on technological challenges (Soucy, Hadjistavropoulos, Pugh, Dear, & Titov, 2019). Thus, strategies to facilitate such an understanding could include ensuring that practitioner training in the DMHI includes a focus on the functional aspects of the intervention and technologies, making the DMHI accessible so practitioners can practice using it, providing local technical assistance or making technical assistance available, and having champions share their experiences engaging with the DMHI. Once practitioners start delivering the DMHI, it may be important to monitor their fidelity to a protocol for delivering the DMHI. Fidelity rating scales for digital services are limited (Hadjistavropoulos, Schneider, Klassen, Dear, & Titov, 2018); however, unobtrusive monitoring systems using communication logs have been applied to assessing the implementation process including fidelity to program delivery (Wang et al., 2015).

Because consumers can use a DMHI outside of standard business hours (a touted strength of a DMHI), there can be increased risks around safety-related disclosures by consumers via the DMHI. It will be important for practitioners to specify plans for monitoring and addressing safety concerns, and to make those plans transparent to consumers (e.g., via Informed Consent to Therapy, Section 10.01). In



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most cases, a DMHI should not be relied upon solely in the event of an emergency, so consumers should be reminded at appropriate times; but, a DMHI can provide one timely link such as providing safety resources like the telephone number for a suicide prevention hotline. Additionally, practitioners need triage guidelines for delivering the DMHI that specify factors such as for whom and how long a DMHI may be appropriate, when continuing the DMHI would be problematic (e.g., significant worsening of symptoms), and, depending on the availability of adequate alternative resources, what to do if discontinuing a DMHI would be problematic by resulting in a lapse in care (e.g., 10.09 Interruption of Therapy).

Costs

Capacity to pursue these strategies depends on the resources in the setting to support this work. This section outlines costs for implementing a DMHI to inform implementation strategies for budgeting and appropriating sufficient funds, given that implementation will hinge on understanding how a DMHI fits into the financial structure of other mental health services. In the United States, billing processes for DMHIs are evolving; reimbursement is possible for some services delivered via technology (e.g., depression screening, some telemedicine), but not online/mobile services with asynchronous (i.e., not in real-time) communication. Though several European countries and Australia have established clinics that deliver Internet-based CBT as part of routine care ("ICBT clinics"), these services are supported by government funding and universal health care (Titov et al., 2018), which differs from the payment

structure in the United States. Without reimbursement codes, settings need to determine how DMHIs will be covered and sustained.

There are costs to license commercially available DMHIs, as well as to integrate the DMHI into the workflow, as doing so requires staff time to design the workflow and resources. The time and process required to initiate a contract with a DMHI vendor can lead to delays in delivery, which could impact financial models for the DMHI in the setting. If technological builds or adaptations are needed to support delivery, programming time also could cause delays. Additionally, the technologies through which the service is delivered require maintenance over time. This could entail routine updates to ensure the DMHI remains compatible with the devices' operating systems through which it is delivered and to resolve any technological issues that arise.

As with any new innovation, training and ongoing supervision/consultation bears the cost of practitioners' and supervisors' time to pursue these activities, and at the expense of other clinical responsibilities. Sufficiently accounting for the time practitioners need to deliver the DMHI and support its implementation is important, and others in the setting need to be aligned on the scope of work that is entailed for successful delivery. Coverage to deliver other services may need to be reappropriated. To inform how to sustain the DMHI as a recurring budget item, a helpful strategy may be to track the time and resources spent preparing for and implementing the DMHI (e.g., Jordan, Graham, Berkel, & Smith, 2019). The return on investment to the setting for implementing the DMHI also can be assessed via capturing the amount of time practitioners spend delivering or overseeing DMHI delivery relative to other mental health services.

A Research Agenda for Improving DMHI Implementation in Health Care Settings

DMHIs offer an attractive modality to deliver mental health services to more people in need. Because of this, health care settings need to ensure such tools are appropriate, accepted, effective, ethical, and blend in with other services, so that psychologists and other practitioners can effectively perform their jobs. In this article, implementation strategies were described for DMHI implementation in health care settings. Given the complexity of integrating a service whose delivery differs from traditional workflows, a multifaceted approach is likely necessary for DMHI implementation. However, any specific approach needs to be empirically tested. Indeed, the next step in a research agenda for DMHIs is to apply these implementation strategies to DMHI implementation in health care settings, evaluate their effectiveness on implementation outcomes (Hermes, Lyon, et al., 2019), and determine how and which strategies could be combined to best support DMHI imple-

mentation. Further, as the rapid pace of technology continues to bring forth new innovations for measuring and intervening on health (e.g., through geolocation data, augmented reality, multisensory integration), it will be important to solidify and disseminate strategies to implement currently established DMHIs.

With that said, applying the proposed compilation of strategies is daunting, and some health care settings may lack the capacity or interest to embark on this work. Because of this, it can be critical for settings to learn how to prioritize which strategies to select. Another research priority is to specify and test mechanisms of action, moderators, and mediators by which implementation strategies impact outcomes for DMHIs, which can increase the specificity by which strategies are selected and linked (Lewis et al., 2018; Powell et al., 2019). Further, evaluations of the cost-effectiveness of applying these strategies, as well as the comparative cost-effectiveness of using different strategies, will be important for helping decision-makers make informed decisions about which strategies to select for DMHI implementation (Eisman, Kilbourne, Dopp, Saldana, & Eisenberg, 2020; Powell et al., 2019). Additionally, the cost to implement DMHIs in different health care settings is important to explore.

However, such research endeavors will take time, and health care settings may be eager to adopt a DMHI sooner. In these instances, settings are encouraged to consider their most pressing barriers and select strategies that are most targeted for addressing those needs. Community-academic partnerships between DMHI implementation scientists and health care decision makers and practitioners could be fruitful to facilitate priority setting and evaluation. Further, many strategies presented here could be pursued with varying levels of sophistication and resource investment to achieve the same goal. For example, as described for data integration, practitioners could manually enter data from the DMHI into the EHR and avoid investing in technological builds to facilitate automated transmission. Settings could then monitor whether manual entry is sustainable, to inform whether a financial investment to improve this process is warranted. As another example, while several strategies were suggested to ensure consumers are supported in learning about and onboarding to the DMHI, it may be sufficient to achieve this only through word of mouth by referring practitioners and/or champions trained on or familiar with the DMHI. As practitioners learn what works in their settings, learning collaboratives or coalitions with other organizations could be useful for sharing resources and lessons learned.

Summary and Conclusions

Given the unmet treatment needs of individuals with mental health problems, DMHIs have an important place for

mental health service delivery and, thus, are ripe for practitioner and consumer use. Though questions remain about how best to achieve this goal, implementation science can help. This article presented a compilation of implementation strategies that aim to address the specific challenges to implementing DMHIs in health care settings, and next steps to address the research-to-practice gap for DMHIs were recommended. Applying implementation strategies to DMHI implementation will enable psychologists to systematically evaluate this process, to yield an enhanced understanding of factors that lead to implementation success and improve the translation of DMHIs for mental health from controlled trials to real-world settings.

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Received September 27, 2019

Revision received May 16, 2020

Accepted May 18, 2020 ■