UNDER SECRETARY OF DEFENSE
4000 DEFENSE PENTAGON
WASHINGTON, D.C. 20301-4000

PERSONNEL AND READINESS

The Honorable Mike D. Rogers
Chairman
Committee on Armed Services
U.S. House of Representatives
Washington, DC 20515

AUG 09 2023

Dear Mr. Chairman:

The Department's response to House Report 117–397, page 195, accompanying H.R. 7900, the National Defense Authorization Act for Fiscal Year 2023, "Mobile Applications for Mental Health Patients," is enclosed.

The report provides a review of the history of mobile apps use in mental health care within the Department of Defense (DoD) and the Department of Veterans Affairs (VA); a review of the research on the feasibility, use, and barriers of mobile apps in the military population; and a discussion of the use of telehealth and mobile apps to provide mental health services to remote individuals. The report shows that DoD has a strong history of collaboration with VA to develop mobile apps in support of mental health care and that mobile apps have a number of advantages. Although DoD and VA have developed highly successful mobile health programs that have the potential to have an impact on the delivery of mental health services, additional evidence is needed to support the effectiveness and usability of mobile apps, to address issues with unclear policy regarding the use of mobile apps, connectivity, privacy, and security, all of which can present difficulties with the successful uptake and use of mobile apps and telehealth technology.

Thank you for your continued strong support for the health and well-being of our Service members and veterans.

Sincerely,

//Signed

Gilbert R. Cisneros, Jr.

Enclosure:
As stated

cc:
The Honorable Adam Smith
Ranking Member

Report to the Committee on Armed Services of the House of Representatives

Mental Health Technology Into Care

August 2023

The estimated cost of this report or study for the Department of Defense is approximately $17,000 for the 2022 Fiscal Year. This includes $0 in expenses and $17,000 in DoD labor.

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EXECUTIVE SUMMARY

This report addresses the feasibility of incorporating technology into existing mental health services, and the use of mobile applications (apps) to provide mental health services to remote Service members (living 60 minutes from the nearest Mental Health Provider) in response to the House Report 117–397, page 195, accompanying H.R. 7900, the National Defense Authorization Act for Fiscal Year 2023. Key elements of this report include: a review of the history of mobile apps use in mental health care within the Department of Defense (DoD) and the Department of Veterans Affairs (VA); a review of the research on the feasibility, use, and barriers of mobile apps in the military population; and a discussion of the use of telehealth (TH) and mobile apps to provide mental health services to remote individuals.

HISTORY OF USE OF MOBILE APPLICATIONS (APPS) IN MENTAL HEALTH CARE WITHIN DOD AND THE VA

The DoD and the VA have a rich shared history of developing libraries of mobile apps to include mobile apps for mental health. Typically, these apps are used as self-management or companions to augment treatment. More recently some of these apps have targeted providers directly with treatment guidelines or staff self-care. In general, app development has been evidence-informed by subject matter experts and grounded in the scientific literature. An evidence-informed mobile app contains content that is based on proven interventions (e.g., deep-breathing exercises to manage stress). For several of these mental health apps, there was collaboration between the DoD and the VA in their design. It is not uncommon for DoD and VA mental health providers to share these applications across agencies with Service members and veterans.

Historically, these mental health apps were "native" to a specific platform. Native mobile apps are accessed in the Apple Store (iOS operating system) and Google Play (Android operating system). Native apps present the challenge that they require ongoing technical and clinical support to keep them up to date; such support is subject to the approval of the respective app store owner. Additionally, download/usage data cannot be used as a proxy for clinical utility of native mobile apps as their usage is not limited to military and veteran populations. In other words, an app's total downloads can be obtained from the platform, but knowledge about who is downloading the app is unknown.

In 2020, the Defense Health Agency (DHA) began moving some of the DoD mobile content to progressive web applications. A progressive web application (PWA) is built to operate on any standards-compliant web browser (mobile or desktop) and lives on a traditional web server where it can be updated in real time. It has the look and feel of a native mobile app with lightning-fast load times and the ability to work offline. While PWAs may have fewer cybersecurity concerns, they are not located on Apple Store or Google Play and must be downloaded separately onto the user's mobile device or tablet, where data are stored. Additionally, the VA has now made some of its mental health mobile content accessible by web browser.

In 2011, Breathe2Relax (B2R) was one of the first DoD published apps. Intended as a stand-alone, self-management app for stress and mood-disturbance management, there are now many, perhaps hundreds, similar deep-breathing apps on the publicly accessed apps' platforms. As of 2022, DoD and VA libraries have expanded for mobile health apps; many are also relevant for mental health. There are currently 23 DoD-developed apps that are publicly available on iOS or Android (see Table 1). In addition, DoD has several progressive web applications, and the VA has two web-based applications. Table 2 is a listing of VA-developed apps for mental health. Of note, some of the earliest developed apps indicated in Tables 1 and 2 were jointly conceptualized and developed by DoD/VA subject experts and software engineers.

TABLE 1

DHA Mobility (*includes apps relevant for mental health)
https://mobile.health.mil

Antimicrobial Stewardship	Supports health care providers with relevant guidelines and evidence-based recommendations	PWA
*Biozen	Pairs with external sensors to provide users with live data covering a range of biophysiological signals	Android
*Breathe2Relax	Diaphragmatic breathing skills to reduce stress	iOS, Android
*Concussion Tools	Provides information to providers on traumatic brain injury (TBI) education, standardize TBI care	PWA (In development)
*Deployment Readiness Education for Service Women	Information about contraceptives and menstrual suppression for deploying female servicemembers	PWA
DHA Pediatrics	For Doctors and health care providers in military medical treatment facilities (MTFs), providing directories, on-call lists, etc.	PWA
*DHA Medication Adherence	Education, reminders to take medications (formerly Antidepressant Adherence)	iOS, Android
DHA Safety Reporting Tool	Tol for submitting safety reports & suggestions	PWA
Immunization ToolKit	Provides practical reference to facilitate & enhance delivery of quality immunization information	PWA
Lejeune Trauma App	NMCCL information, policy, and clinical practice guidelines	PWA
*Pain and Opioid Safety	Provides the users of opioids and those that prescribe them with resources that could save lives	iOS, Android, PWA
*Provider Resilience	Provides tools to health care providers to guard against burnout and compassion fatigue	iOS, Android (In maintenance)
*Tactical Breather	Breathing skills to reduce stress for Service members	PWA
Team STEPPS	Evidence-based framework to optimize team performance across health care delivery	PWA
*T2 Mood Tracker	Track/graph moods via a visual scale	Retired
*Virtual Hope Box (VHB)	Simple tools to help patients with coping, relaxation, distraction, and positive thinking	iOS, Android

TABLE 2

VA App Store – Mental Health

https://mobile.va.gov/appstore/mental-health

ACT Coach	Practice lessons learned during acceptance and commitment therapy (ACT) in your daily life	iOS, Android
AIMS for Anger Management	Better track, address, and manage your anger with AIMS	iOS, Android & Web
Beyond MST	Cope with challenges and improve your quality of life after military sexual trauma (MST)	iOS, Android
Caring4Women Veterans	Resource to help deliver quality care to female Veterans	iOS, Android
CBT-I Coach	Receive support for cognitive behavioral therapy (CBT) for insomnia	iOS, Android
Couples Coach	Explore ways to improve your relationship with your partner	iOS, Android
COVID Coach	Tools to support self-care and mental health during the COVID-19 pandemic	iOS, Android
CPT Coach	Enhance your cognitive processing therapy (CPT) treatment for PTSD	iOS, Android
Insomnia Coach	Guided training and tips to help you track insomnia and improve sleep	iOS, Android
Mindfulness Coach	Learn mindfulness to reduce stress and improve emotional balance	iOS, Android
PE Coach	Use this app during prolonged exposure (PE) therapy with a health professional	iOS, Android
PFA Mobile	Assists with administering PFA during a response effort	iOS, Android
PTSD Coach	Get the info, support, and tools you need to manage PTSD	iOS, Android
PTSD Family Coach	Receive the support you need for living with someone who has PTSD	iOS, Android
STAIR Coach	Enhance your in-person STAIR psychotherapy with interactive tools and education	iOS, Android
Stay Quit Coach	Create a tailored plan to quit smoking and stay smoke-free	iOS, Android
Stroke Coach	A robust clinical decision support and evaluation tool designed to increase the speed, accuracy, and efficacy of acute stroke care from door to needle	iOS
VA Mental Health Checkup for Care Teams	The VA Mental Health Checkup application (app)	Web
VA Mental Health Checkup for Veterans	Monitor, assess, and access information for mental health conditions	Web
VetChange	Develop healthier drinking habits through this app's tools and guidance	iOS, Android

RESEARCH FINDINGS ON THE FEASABILITY, USE, AND BARRIERS OF MOBILE APPS IN THE MILITARY POPULATION

The Practice Based Implementation Network was developed to build the infrastructure that bridges the gap between behavioral health research and clinical practice for the DoD and the VA. The goal of the network is to rapidly translate research findings into practice using an enduring cost-effective and evidence-based dissemination and implementation approach that directly engages leaders, champions, and providers in piloting evidence-based or promising practices, programs, and policies such as promoting the use and determining the feasibility of mobile apps (Creason et al, 2019).

Research has shown that using technology for the provision of mental health care is a feasible approach to both enhance provider knowledge of the core competencies related to the integration of mobile apps and to facilitate the use of mobile apps in clinical care (Gould et al., 2019, Pratt, Branch, and Houston, 2019). At the provider level, DoD and the VA have provided best practice guidelines to support active on-going training for the use of mobile apps (Armstrong, Edwards-Stewart et al., 2018; Armstrong et al., 2021). The DoD mobile health provider training program, one-day workshops conducted at military bases throughout the United States, focused on several core competencies: evidence, integrating apps into clinical practice, digital data security and privacy, ethics, and cultural considerations (Armstrong, Ciulla, et al., 2018). From October 2014-September 2017, 20 workshops (usually a full day of training) were delivered at 15 military or VA locations, reaching 760 DoD and VA clinicians (psychologists, social workers, physicians, and nurses).

An evaluation of the program found that approximately 41 percent of trainees stated that they were using health apps in a clinical setting prior to the workshop training; after the training, about 94 percent indicated their intent to use health apps, and at a three-month follow-up, about 91 percent indicated that they were using health apps in a treatment context. When considering the feasibility of mobile health integration, the training evaluation system found that not only was the training effective in increasing the use of health apps (self-report), but fully 40+ percent (dating back to 2014-2017) were using health apps prior to the workshop. Universal training competencies that can be generalized across disciplines include privacy, security, and patient safety; technical skills pertaining to digital health technology; and ethical and legal considerations (Cavanaugh et al., 2022).

There is strong support in the literature for the acceptability and feasibility for using mobile apps to deliver mental health care in the military population (Armstrong et al., 2017; Shore et al., 2014). A systematic review of mental health apps conducted by Gould et al. (2019) established that mobile apps developed by the DoD/VA are grounded in empirically supported theories and treatment and have three unique characteristics: 1) The apps were developed for non-commercial use and included health care professionals as part of the team; 2) The platform used for the mobile apps is available across iOS and Android; 3) No cost to the Service member or veteran to download the apps. Other distinguishing factors about DoD/VA mobile apps that Gould et al (2019) reported include shared interfaces, graphics, and options/features (e.g., Voice Over, subtitles on videos, etc.) all of which may increase comfort, use, and accessibility.

There are barriers that exist with the integration of mobile apps and web devices that consist of "how-to" uncertainty, unclear policies regarding the use of mobile health technology, connectivity, privacy, and security concerns; lack of employer support; tech use restrictions imposed by employers; concerns about the effectiveness of mobile health; and interoperability versus integration with the electronic health record (Armstrong, Ciulla, et al.; 2018). Another noteworthy limitation is the reliance on feedback from users (providers and clients) to determine the usability of mobile apps. Additional research focused on randomized clinical trials to examine the efficacy and effectiveness of mobile apps is needed to further determine the feasibility and benefits of mobile apps in mental health care.

Feasibility and Usability of Incorporating Mobile App Technology into Mental Health Services:

Feasibility studies describe one or more design solutions to a clinical problem (or use case) and determine if the proposed solution is practical or feasible. Preferably more than one solution is offered, in which case the study compares the various designs and determines which option is best (Perelman et al., 1997). For behavioral health, evidence of feasibility would require that an app be used by patients on their own and not solely in a laboratory setting (Czajkowski et al., 2015). Gould et al. (2019) conducted a systematic review examining feasibility and usability as well as other domains (acceptability, efficacy, and effectiveness) of several DoD/VA evidence informed apps:

1) B2R:

B2R is a self-management app where users manage stress with diaphragmatic breathing skill rehearsal. The B2R provides psychoeducation about the biological effects of stress; video and audio instructions modeling diaphragmatic breathing skills and using a tracker of stress before and after each session. The only published study consisted of a summary of download data and cost savings of using the app for stress reduction compared with in-person care (Luxton et al., 2014). Since this study, the most recent data is available for September 2020 to August 2021 with 398,381 active users and 62,099 downloads. As a native app available to the public, this data cannot be attributed solely to Service members or veterans. While there are no other studies of the app itself, there are numerous studies citing the effectiveness of deep-breathing skills to manage stress (Zacharo et al., 2018; Ma et al., 2017; Hopper et al., 2019).

2) PTSD Coach:

PTSD Coach is a self-management app that provides psychoeducation and skills to reduce post traumatic stress disorder (PTSD) symptoms. PTSD Coach is evidence-informed in that it uses interventions based on CBT for PTSD. Concerning PTSD Coach, PTSD clinicians and patients provided input in the design of the app prior to conducting a feasibility and acceptability study with large majority of respondents in a residential program endorsing moderate satisfaction (Kuhn, Greene, et al., 2014). A study of consumer feedback and usage trends indicated that PTSD Coach was reaching users with at least moderate symptoms and appears to be effective in reducing momentary distress (Owen et al., 2015). Two randomized

clinical trials (RCTs) found PTSD severity compared with waitlist controls, also significantly reduced depressive symptoms and improved functioning (Miner et al., 2016; Kuhn et al., 2017). Another RCT demonstrated that using PTSD Coach for self-management or with the support of a clinician, both resulted in significant declines in symptoms; though better results were seen when the app was used to augment treatment (Possemato et al., 2016). Efficacy was also demonstrated in a non-randomized study. In sum, usability, feasibility, acceptance, and preliminary efficacy were addressed in PTSD Coach studies. To date, no studies have investigated its effectiveness.

3) Virtual Hope Box (VHB):

Although VHB is a self-management (stand-alone) app, it has also been used as a treatment companion for safety planning. It provides skills to manage negative thoughts and feelings, particularly in the context of suicidal ideation. VHB provides reminders and reasons for living using digital content such as videos, pictures, and songs. The app also offers games for distraction, relaxation tools, and the ability to contact emergency services (i.e., Veterans Crisis Line, 911) if needed. During the development of the app, a case series was used to examine the overall usability of the app, and in cross-over design it was used more frequently than a physical or conventional hope box (Bush et al., 2015). A RCT with veterans experiencing suicidal ideation demonstrated significant improvements in coping compared to veterans receiving usual care (Bush et al., 2017). Since these studies, the most recent data is available for September 2020 to August 2021 with 446,499 active users and 66,985 downloads. In sum, VHB's usability, feasibility, acceptance, and efficacy were addressed in these two studies. No studies offer evidence of effectiveness of this app.

Rating Scales and Methodologies to Evaluate the Usability of Mental Health Apps:

There are no requirements from the distribution platforms for health apps to be evidence informed or supported by clinical practice guidelines. Although Apps store's quality claims frequently invoke scientific language, high-quality evidence is not commonly described (Larsen et al., 2019). As a result, several rating scales or methodologies have been developed to evaluate mobile applications, including mental health applications. Additionally, a handful of mobile mental health apps have achieved approval by the Food and Drug Administration. A brief overview of various rating systems can be found in the Mackey et al. paper (2022). Principal among current approaches is the Mobile App Rating Scale; a rating system developed by the American Psychological Association; and another developed by One Mind Psyberguide.

With so many current and future choices, it is difficult to identify which apps to use or recommend for clinical use. To support military providers' selection of apps from the now extensive pool of health-related apps on the App Store and Google Play, a DHA team developed the App Rating Inventory, an objectively-based, 28-item, 3-criterion scoring system. The three constructs are as follows: **evidence** (does the app have a medical/ behavioral focus, is the evidence direct or indirect, i.e., evidence-based or evidence-informed, and is content based on an empirically-validated treatment model); **content** (does the app offer skills-learning features, opportunities for user-generated data, and external links to other information); and **customizability** (does the app offer editing and augmented reality capabilities and features that support ease-of-use).

USE OF TELEHEALTH AND MOBILE APPS TO PROVIDE MENTAL HEALTH SERVICES TO REMOTE INDIVIDUALS

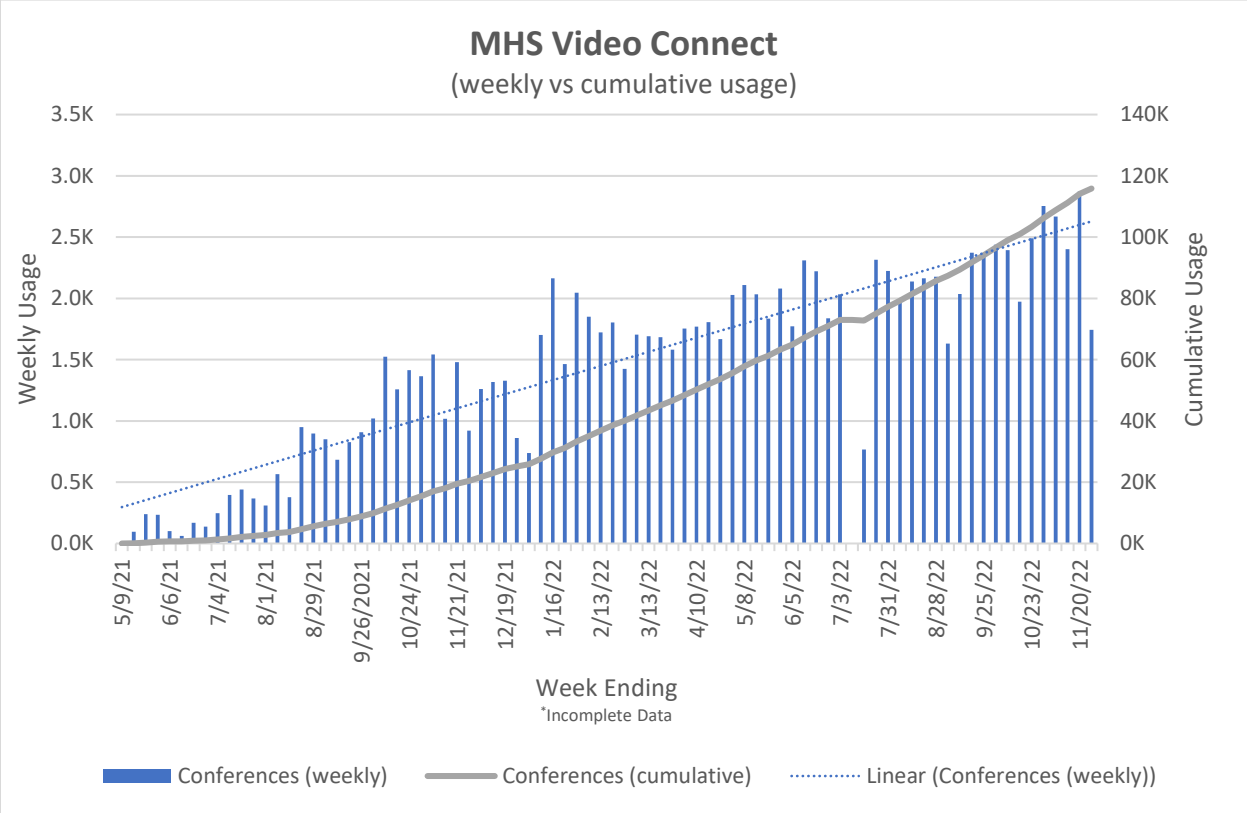
The use of TH to include the provision of mental health care through video conference and teleconference modalities has increased in popularity. At the onset of the coronavirus disease 2019 (COVID-19) pandemic, VA already had a mobile app VA Video Connect, which allows a veteran to receive care on both the web or personal mobile device. From January 2020 to October 2021, the VA increased video visits (all specialties) by 18-fold (from 41,146 to 751,957) per month (VA Telehealth 2020 Insights Report). In contrast, the DoD did not have its own mobile app, so relied on commercial off-the-shelf apps or existing military medical treatment facility (MTF)-MTF connectivity for TH. Between April and September 2019, the DoD delivered 7,000 tele-mental health visits (video and audio) per month. During the same period in 2020, there were approximately 42,000-59,000 TH visits for behavioral health (BH) care for a 6- to 8-fold increase (Hepner et al., 2021).

TH modalities can reduce stigma and diminish issues with transportation and/or difficulty with getting time off from work, all of which can present barriers to care (Jacobs et al., 2019). For Service members, the use of TH modalities increases access to care by offering scheduling flexibility and extends the availability of services to remote individuals beyond the traditional MTFs (Mohammadi et al., 2020 & Zinzow et al., 2012). An additional bonus is that DoD can connect with Service members in need of care using these modalities without having to compromise the cyber security requirements (Little et al., 2021). The rapid review conducted by Ballanti et.al (2021) concluded that clinical outcomes of TH were similar to In-Person service delivery. Although post treatment effects were favorable for TH, patients with high symptom severity and mental health comorbidity had better outcomes with In-Person service delivery compared to TH.

Military Health System (MHS) Video Connect (VC):

DHA recognized the increased demand for virtual mental health visits with the limitations of face-to-face care with the COVID-19 pandemic. In 2020 alone, DHA delivered 105,476 visits in contiguous United States and 15,122 outside the contiguous United States. In May 2021, DHA launched the MHS VC, a web-based virtual platform for use in the delivery of care from provider to patient. MHS VC allows the patient to receive remote care on their device at their location. The patient downloads an app from Apple Store or Google Play to conduct a virtual visit from a smart phone or tablet. The patient receives an email with the appointment time and a web link. Using this technology, the provider can be located anywhere to conduct the visit. In sum, this capability has the potential for patients to receive care and providers to deliver care from anywhere on the globe, 24/7. Further MHS VC integrates into MHS GENESIS, DHA's electronic health record or can be used as a "stand-alone" application. Figure 1 highlights the weekly versus cumulative usage of MHS VC over time.

FIGURE 1



Behavioral Health Data Portal (BHDP) REMOTE:

BHDP is a web-based system used by BH staff to collect, track, and display a patient's assessment data, BH diagnosis and treatment planning. The patient self-reports their symptoms by electronically entering their responses to standardized measures such as the CSSRS-S, PHQ-9, PCL-5 and up to 20 more evidenced-based tools. The provider can graphically show the patient at the time of the visit their treatment progress using a color-coded graphical dashboard and thereby engage the patient in their treatment through collaborative decision-making.

Prior to the COVID-19 pandemic, the BHDP was administered to the patient in a kiosk setting in the waiting area of the clinic. In 2020, a process was created for patients to securely upload their clinical measures using DOD-Safe which required significant training for providers and coaching for patients. In April 2022, DHA launched BHDP Remote so patients can enter their electronic data through an app on their mobile device. The feasibility of the BHDP Remote solution is evidenced by a 95 percent completion rate (1,827 out of 1,932) of surveys started. The highest completion rate is 98.5 percent (470 out of 477 surveys) for Service members stationed in Korea. In sum, BHDP Remote is an excellent treatment companion to virtual mental health visits.

SUMMARY AND CONCLUSIONS

The near universal adoption of mobile devises for communication, productivity, and entertainment offers considerable potential advantages for military mental health care: 1) Go-to Portability: Mobile devices can access content on-the-go and monitor symptoms in real time; 2) Content: Easy-to-access educational and skills-based content that can be readily updated; 3) Remote Care: Therapy can be conducted from phone to phone or phone to laptop via MHS VC; 4) Interoperability: Data can transmitted to providers or the electronic record for storage and clinical review; 5) Micro-Interventions: Mobile devices can could offer assessments and skills-based exercises and prompts; 6) Asynchronous Communication: Data received from a mobile device can be tracked between sessions; 7) Personal Health Record: Assessments and progress with skills development can be accessed 24/7; 8) Patient-Reported Outcomes: Treatment progress can be tracked via standardized measures (versus self-report); and 9) Digital Patient Engagement: Integrating mobile health into care "meets the patient where they are at."

Although DoD and the VA have developed highly successful mobile health programs that have the potential to have an impact on the delivery of mental health services, it is important to note that there are several limitations that present barriers to the integration of mobile apps and web devises. Additional evidence supporting the effectiveness and usability of mobile apps is still needed. Much of the research has relied on feedback from users (providers and clients) to determine the usability of mobile apps. Research using randomized clinical trials to examine the efficacy and effectiveness of mobile apps is needed to further determine the feasibility and benefits of mobile apps in mental health care. Furthermore, "how-to" uncertainty, unclear policies regarding the use of mobile health technology, connectivity, privacy, and security concerns; lack of employer support; tech use restrictions imposed by employers; and concerns about the effectiveness of mobile health can present issues with the successful uptake and use of mobile app and web technology. Even though TH has significantly improved access to care for many individuals, a shortage of qualified behavioral health professionals poses a barrier for people to obtain the services that they need.

While mobile app technology is not a substitute for therapy services, these approaches can supplement therapy and can offer additional support. The DoD remains committed to offering cutting edge mental health care for all Service members and will continue to evaluate the use technology (e.g., mobile apps, TH) to tailor care to meet the individual needs of the military population.

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