Barriers and Facilitators to Mobile Application Use During PTSD Treatment: Clinician Adoption of PE Coach

GREG M. REGER received his PhD in clinical psychology from Fuller Theological Seminary. He is currently the Deputy Associate Chief of Staff for Mental Health at the VA Puget Sound Health Care System, Seattle/Tacoma, Washington, and an Associate Professor of Psychiatry and Behavioral Sciences at the University of Washington School of Medicine, Seattle, Washington. His areas of research interests include innovative technologies to support psychological health and military psychology.

KENDALL C. BROWNE received her doctorate from the San Diego State University/University of California, San Diego Joint Doctoral Program in Clinical Psychology. She is currently a clinical psychologist within the Corporal Michael J. Crescenz VA Medical Center, Center of Excellence in Substance Abuse Treatment and Education and the VA Puget Sound Health Care System, Seattle Division, Washington. She is an acting assistant professor in the Department of Psychiatry and Behavioral Sciences at the University of Washington School of Medicine. Her areas of professional interest include the assessment and treatment of substance use disorders and co-occurring post-traumatic stress disorder across the spectrum of mental health care settings.

TIMOTHY R. CAMPPELLONE received his PhD in clinical psychology from the University of California, Berkeley. He is currently a MIRECC post-doctoral fellow at the San Francisco VA Medical Center, San Francisco, California. His areas of professional interest include using technology to improve assessment and access to treatment in serious mental illness.

CAROL SIMONS received her BA in psychology from the Meredith College in Raleigh, NC. She is currently a research health science specialist/qualitative interviewer for VA Puget Sound Health Care System. Her areas of professional interest include mental health, women’s health, chronic illness, health promotion, and technology’s role in health care.

ERIC KUHN received his PhD in clinical psychology from the University at Albany, State University of New York. He is currently a research clinical psychologist at the VA National Center for PTSD, Dissemination and Training Division, in Menlo Park, California, and clinical assistant professor (affiliated) in the Department of Psychiatry and Behavioral Sciences at Stanford University School of Medicine. His areas of professional interest include using technology, both web and mobile, to increase access to and engagement in mental health care for individuals with PTSD and to make care more patient-centered, efficient, and effective.

JOHN C. FORTNEY received his PhD from the University of Iowa. He is a professor in the Department of Psychiatry and Behavioral Sciences at the University of Washington School of Medicine, and the Director of the Division of Population Health. He is also a research career scientist at the HSR&D Center for Innovation for Veteran-Centered and Value-Driven Care at the VA Puget Sound Health Care System and Director of the Virtual Specialty Care QUERI Program. For the last 25 years his research has focused on issues of access to care, especially the delivery of mental health services in rural primary care clinics.

HEATHER SCHACHT REISINGER received her MAA (Masters of Applied Anthropology) from University of Maryland, College Park, and her PhD in Anthropology from American University. She is currently associate director for research at the Center for Comprehensive Access and Delivery Research and Evaluation (CADRE) at the Iowa City VA Health Care System, Iowa City, Iowa. She is also associate professor of general internal medicine at Carver College of Medicine, University of Iowa. Her research areas include qualitative and ethnographic methods, implementation science, telemedicine, and infection control and prevention.

THIS MATERIAL IS BASED ON work supported by the U.S. Department of Veterans Affairs, Quality Enhanced Research Initiative (QUE 15-282). The contents do not represent the views of the U.S. Department of Veterans Affairs or the United States Government.

We thank Katherine Raffle for her administrative support of this project.

Correspondence concerning this article should be addressed to Greg M. Reger, VA Puget Sound Health Care System, 9600 Veterans Drive, A-116, Tacoma, WA 98493. E-mail: greg.reger@va.gov
providers decided to use PE Coach, aspects and features of PE Coach appreciated, and their perspectives on patient use of the app. Facilitators of PE Coach use included the positive impact of a treatment-companion app on patient perceptions of treatment credibility, the side-by-side collaboration enabled by the app, the consolidation of treatment forms and resources on the patient’s phone, and the therapist perceptions of benefits to their patients by app use. Some of the barriers to use included technical challenges, feature differences between the Android and iOS versions of the app, inadequate knowledge of available features, and the lack of an archive of previously completed homework and assessment forms. Results provide useful information about how to better promote the adoption of PE Coach, increase full feature use, improve the app, and could help generate hypotheses for exploring how other behavioral health technologies are used.

Public Significance Statement
This article suggests that several factors facilitate or serve as barriers to the use of features of PE Coach, a treatment companion mobile application used during prolong exposure. Adoption of PE Coach may be improved by leveraging facilitators and mitigating the impact of barriers. Some lessons learned may have relevance to the adoption of other behavioral health technologies.

Keywords: prolonged exposure, posttraumatic stress disorder, mobile applications, technology, PE Coach

The wars in Iraq and Afghanistan coincided with a digital revolution that resulted in the unprecedented adoption of mobile computing platforms (Poushter, 2016). As a result, mental health leaders and researchers explored opportunities to support veterans and service members with software development to address a range of mental health self-care and treatment supports. Mobile applications (apps) and Internet resources with responsive web design were developed to address a wide range of military service related challenges, including alcohol and drug misuse, anger, anxiety, depression, sleep difficulties, life stress, financial problems (Bush, Bosmajian, Fairall, McCann, & Ciulla, 2011), risk of suicide (Bush et al., 2015), and posttraumatic stress disorder (PTSD; Belsher et al., 2015; Kuhn et al., 2017; Possemato et al., 2016), to name a few.

PE Coach (Reger et al., 2013) is a mobile app that was designed by the Department of Defense (DoD) and Department of Veterans Affairs (VA) to support the tasks required of patients and providers engaged in prolonged exposure (PE) therapy (Foa, Hembree, & Rothbaum, 2007) for PTSD. PE is arguably the best researched PTSD therapy protocol (Powers, Halpern, Ferenschak, Gillihan, & Foa, 2010) and has shown effectiveness with a range of trauma populations, including veterans (Eftekhari et al., 2013) and active duty soldiers (Reger et al., 2016). The VA has supported the dissemination of PE through one of the largest implementation efforts in the history of mental health (Karlin et al., 2010). Despite the achievements of this monumental effort, barriers to the implementation of PE could limit the reach of this treatment protocol to some patients. Following a brief review of these barriers and the rationale for the development of PE Coach, this article summarizes the results of qualitative interviews with VA therapists to learn how they and their patients use the various features of PE Coach and the factors that served as facilitators and barriers to app adoption.

Rationale for the Development of PE Coach
Approximately 10% to 17% of combat-deployed service members screen positive for PTSD (Kok, Herrell, Thomas, & Hoge, 2012). Several effective treatments are available for those diagnosed. Trauma-focused psychotherapies are evidence-based treatments that are recommended by multiple reviews and clinical practice guidelines (Management of Posttraumatic Stress Working Group, 2010; Institute of Medicine, 2008). PE is one such treatment and involves 10–15 weekly or twice weekly therapy sessions focused on helping the patient confront safe but distressing situations to reduce anxiety. The key features of the treatment involve (a) psychoeducation about why PE works, how people commonly react to traumatic events, and breathing retraining; (b) in vivo exposure, which involves confrontation of anxiety provoking situations, places and circumstances in the patient’s day-to-day life; and (c) imaginal exposure, during which the patient revisits their trauma for 45–60 min and subsequently processes associated emotions and thoughts. The patient and therapist communicate about distress throughout treatment by using Subjective Units of Discomfort (SUDS), which is a simple 0 to 100 scale, on which a higher number indicates increased distress. PTSD symptoms are monitored throughout treatment via self-report measures to monitor progress and help identify barriers to recovery.

As effective as PE is there are features of the PE protocol that can pose barriers to delivery by providers or adherence among patients. For example, PE therapists must audio record two tracks during most sessions. The full therapy session is recorded at every encounter. Beginning at Session 3, a separate audio recording is made of the imaginal exposure portion of the session. These recordings are listened to by the patient outside of session as essential homework. However, the computer networks of health care systems often prohibit digital recording software, cassette recorders are increasingly rare, and loaned digital recorders may not be returned by patients. Patients also face challenges as they must find private and convenient places to listen to these recordings, which can be challenging when that recording is in the form of a CD or cassette. During previous presentations about PE Coach in a range of health care settings, some therapists have reported to the first author that such barriers lead them not to use PE at all, or to implement it without audio recording (despite being a core element of the therapy).

Additional PE homework activities leverage the time between sessions for continuation of PE psychotherapy tasks that support recovery, including ongoing psychoeducation and the completion of in vivo exposures. Patient workbooks or individual worksheets...
are used to provide psychoeducation on the rationale for PE and common reactions to traumatic events. Paper logs of completed daily in vivo and imaginal exposure homework are also used to track completion of assigned exposure practice and to track level of anxiety and discomfort (i.e., SUDS) experienced by the patient during these exposures. Unfortunately, the avoidance symptoms of PTSD and/or patient inconveniences can reduce adherence with emotionally difficult PE homework. For instance, paper homework worksheets can be lost or left unused and therapists who find patients completing worksheets in their waiting rooms are left wondering whether the retrospectively recalled information accurately reflects homework adherence. Furthermore, homework completion is a significant predictor of outcome in PE, though treatment outcomes for those moderately adherent did not differ from those with high adherence (Cooper et al., 2017). Regardless, there is no objective feedback for providers about patient homework adherence, which would be useful to identify barriers to homework completion.

To mitigate these challenges, the DoD and VA developed PE Coach, a mobile app for Android and iOS (i.e., Apple) designed to support the tasks of patients and providers engaged in PE. PE Coach has been described in detail elsewhere (Reger et al., 2013). Briefly, the app is designed to be installed on the patient’s mobile device. PE Coach content is organized by each PE session, including content for the session as well as corresponding homework assignments. Patients use the app in between sessions and share content entered into app with their provider during sessions. Patients record their subjective distress during daily in vivo exposure homework. They also use the app to review psychoeducational assignments. A breathing retraining tool is available in PE Coach and can be used to model and guide the daily breathing retraining homework that is part of the treatment. Additional features are used during each therapy session. Audio recordings of the full PE therapy session and the separate recording of the imaginal exposure are made using the app and the audio files are stored within the app, which can be locked with a PIN. Although many audio recording mobile apps are available, some of these apps risk generating audio recordings that may be pulled into music aggregating software. In some cases, these tools enable sharing audio files with others. This is not a risk when PE Coach is used. Other features include the ability to create the in vivo hierarchy in the app, track symptoms over time, and a final session comparison of symptoms and reductions in distress. As it is not a self-help app, the provider must educate the patient about the conveniences available in the app, and the patient must agree to use and install it.

PE Coach Adoption by Therapists and Patients

In a survey of 163 VA PE providers who read a description of the planned PE Coach before the app became available (Kuhn et al., 2014), 86% of participants agreed that PE Coach would make it easier to complete homework and 76% agreed that they intended to use the app. Moreover, in a survey of 271 VA PE therapists conducted after the release of PE Coach (Kuhn et al., 2015), exactly half of those who saw at least one PE patient in the last year reported using PE Coach during that timeframe. Of those therapists who had used PE Coach, 94% reported intent to continue using it with their patients. Among those who had not yet used the app, 78% reported intent to use PE Coach in the future. In addition to a positive response from therapists, a case report of two patients compared their treatment experience with and without PE Coach. After completing 4 PE sessions using the app and 4 sessions using traditional approaches, both patients self-reported a preference for treatment with PE Coach (Reger, Skopp, Edwards-Stewart, & Lemus, 2015).

Despite these findings, little is known about how providers and their patients are using PE Coach. As noted above, there are a variety of features available in the app but it is not known whether all of the features are routinely utilized, what facilitates the use of selected features, or what serves as barriers to features not used. Reports from VA training and dissemination teams have suggested that some may be using PE Coach exclusively to audio record and playback the psychotherapy sessions (E. Kuhn, personal communication, May 24, 2016). However, no studies have examined which features are and are not being used and why. This article summarizes a funded quality improvement project that involved qualitative interviews conducted with VA therapists who reported using PE Coach in the context of delivering PE. This project aimed to better understand how providers decided to use PE Coach, which app features providers chose to use and why, and provider perspectives on patient use of PE Coach.

Interviews

Participants

Qualitative interviews were conducted with providers from a large urban VA health care facility on the west coast. Thirty-nine PE providers at the facility were invited to participate via an information email. To be included in the interviews, PE providers had to have used PE Coach in the past. We purposefully sampled PE Coach users to elicit in-depth information on their experience using PE Coach. Of the 35 PE providers who had used the app, 25 participated. Participating providers were primarily psychologists (n = 24) and there was one social worker. All were formally trained in PE through the VA dissemination program (Karlin et al., 2010) or other PE training workshop and had used PE Coach in the past during treatment of veterans with PTSD. These providers reported an average of 4.2 (SD = 3.3) years’ experience providing PE and 1.9 (SD = 1.4) years using PE Coach. As a group, they estimated having treated 450 patients while using PE Coach (M = 18.0, SD = 39.12). Twenty (80%) of the providers reported having received no formal training to use PE Coach. Among those who received formal training, they reported participating in a formal didactic or specialized training from a PE Coach content expert.

Interview and Analysis Methods

For this quality improvement project, rapid ethnographic assessment (REA) was utilized to frame the qualitative inquiry, as it can quickly develop a preliminary understanding of a situation from the insider’s perspective (Beebe, 2001). After phone interviews with PE Coach content experts and local staff and an initial site visit, semistructured interviews and templated analysis were selected and planned by an anthropologist with expertise in qualitative research. Semistructured interviews were conducted by the team’s anthropologist, two clinical psychologists, and a research
coordinator with training in qualitative interviewing. Providers were contacted by the project team to set up an interview at which time the quality improvement project was explained in more detail and protocols were reviewed. Interviews were conducted individually, and were completed in person or by phone. Interviewers completed templated data collection forms at the end of each interview and interviews were audio recorded for reference postinterview.

The interview template included three primary categories of responses: (a) How providers decided to use PE Coach; (b) aspects and features of PE Coach appreciated by providers, and (c) provider perspectives on patient use of the app. Following the REA framework, the interview lead (i.e., study anthropologist) and the research assistant then compiled the individual interview templates into a global template and reviewed the global template to identify facilitators and barriers to app feature use. Quotes were identified from the global template and transcribed from the original recordings.

**Interview Findings**

Results from the qualitative interviews are organized by factors identified that facilitated PE Coach use, followed by barriers to use.

**Factors Facilitating PE Coach Feature Use**

**How providers decided to use PE Coach.** Providers reported several different ways in which they came to a decision to use PE Coach, which may highlight facilitators of app use. First, some providers noted that they were introduced to PE Coach by a clinical supervisor:

> My supervisor said, “This is what I do,” (laughs) so it was one of those things I didn’t think much. I was like, “Oh okay.” So I did that and I also found—, I downloaded it myself, whenever he first told me about it, before I ever told you, you know, veterans to download it, to kind of see what it was about. And I found it was actually quite helpful for me as well.

It is interesting to note that the clinical supervisor who introduced the therapist to the app could be a facilitator or barrier to full feature use. Participants reported using the app as their supervisors taught them. For example, some participants indicated that their supervisor focused on the audio recording feature; therefore, they only used this feature in sessions with their patients. Other providers adopted PE Coach after being introduced to it by trusted colleagues, whereas a small number of providers had decided to use the app after an inservice training or other formal didactic experience.

Consistent with prior survey research (Kuhn et al., 2015), some providers reported that their comfort with technology and interest in incorporating helpful tools into their clinical practice contributed to their decision to use the app. Additionally, as the provider above noted, some providers noted that an initial opportunity to test out the app by exploring the range of available features using mock data increased their own comfort and was important in their decision to use the app with future patients:

> I think one of the things that’s interesting about technology is that maybe unlike another way of interacting with therapy is sort of like how much we need to like practice or learn it ourselves, you know? I feel very much like that is a big part of it. Like if I hadn’t’ve downloaded it and played it myself and talked to our PE trainer like how he uses it I probably wouldn’t have jumped in and used it with as many patients as I do.

**Reinforcing app use.** After deciding to use PE Coach, participants described overall characteristics that reinforced their continued use of the app. The convenience of having all of the patients PE materials in one place was perceived as a particular strength. Instead of multiple CDs or cassette tapes, a paper in vivo hierarchy, multiple forms documenting homework for in vivo and imaginary exposure, and handouts for psychoeducation, providers needed only concern themselves with the availability of the patient’s mobile device, which providers noted was rarely forgotten:

> I think it’s easy for the veterans to use rather than keeping track of paperwork, um, that they can just kind of whip it out wherever they are and know what to do rather than scrambling to find their piece of paper or pulling out papers and recording SUDS ratings. Um, it’s everything in one place. . . . And the app is just very you know it’s very intuitive. It’s easy to find things.

A second provider reported the following: “The ‘I lost the homework paper’ excuse doesn’t work unless they lose their phones and I haven’t had that excuse yet.”

Some providers also noted that having the structure of each PE session embedded in the app facilitated treatment delivery. Obviously, the app is not designed to replace a checklist of content for each session. That said, the structure of the app helped support keeping providers on track and reminded them of key tasks for each session: “I mean I think it’s always a good reminder for me, um, to cover everything that’s in the protocol.”

According to another provider:

> It’s really helpful for structuring session really well. I think one of the things that sometimes happens when you do therapy a long time is—, if you’re not—, if you feel like you know a protocol but you don’t use it so often that you remember the nuances of what you are supposed to do in Session 3 or 4. It’s nice to have it in the app because you’re with the client looking through and your like, “Oh yeah. Right, we needed to do Breathing Retraining today and I didn’t get to that.” It kind of keeps you in line too and kind of trying to be mindful of a protocol when it’s necessary. I think that’s helpful.

In addition, providers reported that some patients felt that the existence of a treatment companion app provided credibility to the treatment. The mere availability of a mobile app that corresponded to the treatment they were about to do indicated that this was a formal, established, and/or reputable treatment approach: “I like that it looks like professional and secure. . . . I think it adds some legitimacy to the treatment when they see that it shows up also in the app.”

A similar statement was made by another PE clinician interviewed:

> I would say people were pretty into it, you know. . . . I think it in some ways it like legitimizes the treatment somehow. They are like, “Oh, it’s got a fancy app it must be a really true deal like effective treatment.”

**Provider reasons for using particular app features.** Interviews also identified specific experiences of using PE Coach features that
providers liked in the app, which served to facilitate or reinforce feature use. All providers described the convenience of recording sessions, and particularly imaginal exposures within sessions, as key features they used with PE patients. The ease of entering in vivo SUDS in real-world settings and in real-time during homework completion was also a perceived advantage. Accordingly, providers speculated that they might get a more accurate description of patient homework experiences for those who used PE Coach, as SUDS may be more likely to be entered at the time of homework completion.

The homework review feature of the app provided objective information about what and when homework was completed by the patient. This feature was noted by some providers as reinforcing their use of the app by increasing patient accountability. Providers reported that it supported homework adherence and the identification of barriers to homework, when present. In turn, clinicians felt their PE Coach patients were more engaged in treatment and received greater treatment benefit. Some providers also appreciated the “side-by-side” collaboration with their patients during review of PE Coach content and homework on the patient’s mobile device:

I like it sort of tells on them if they listen to the recordings or not that was sort of fun to discover sitting side-by-side and going through homework review with people so I didn’t realize that had been built in that’s not a newer surprise but that was a pleasant surprise I thought was pretty cool.

During another interview, a PE provider stated:

I think it’s also nice for me because I have to keep less track of things. [laughs] if its kosher to admit that. Um you know, it’s also all in one place for me and I think it helps me sort of make sure that veterans are doing that outside work that really needs to be done as part of the therapy so it’s kind of reassuring for me that the homework is getting completed.

Provider perceptions of patient advantages. One category of factors that facilitated provider use of PE Coach was the perceived benefits of PE Coach to patients. Providers noted the increased convenience to patients listening to the recording of their imaginal exposure and psychotherapy sessions. Having these recordings on their personal mobile device also enabled more convenient and private opportunities for listening to imaginal exposures on a daily basis. As one provider describes to her/his patients:

There’s this great app that we can use that’s developed by the VA that can assist called PE Coach that can kind of help us keep track of homework and and so forth. It’s sort of a neat way to carry your treatment with you in your pocket in a discreet way.

Some providers noted that the storage of PE-related data on the patient’s phone increased privacy. The combination of the ability to lock the phone (often to include encryption) and to enable a PIN protect feature within the PE Coach app was perceived as an improvement relative to CD or cassette recordings and paper forms traditionally used. Some providers were of the opinion that use of PE Coach was more likely to engage patients in care. For example, some providers believed that patients who used PE Coach were more likely to read the psychoeducational materials than those who did not.

Barriers to PE Coach and Specific Feature Use

One theme that emerged during discussions of barriers to PE Coach use was technical challenges. Use of PE Coach during the first PE session required patient installation and some providers noted the inability to download the app while in session due to poor mobile network connectivity at the clinic. Accordingly, providers often instructed their patients to download the app prior to the first session, which if forgotten, created challenges to that session. Furthermore, software on mobile devices is not immune to crashes or glitches, particularly with numerous device types (especially Android) and multiple wireless carriers. Some providers reported that when technical problems occurred during a psychotherapy session, they were suddenly faced with an unexpected challenge during an emotionally difficult treatment. Some providers were unable to rapidly troubleshoot technology issues and this served as a frustration and a barrier to future utilization.

A related barrier identified was the challenges associated with differences between the Android and iOS versions of PE Coach, which are similar, but not identical. Providers were challenged to have a working knowledge of the layout and functionality of both apps and two phone platforms. Providers discussed having increased familiarity and comfort with whichever version of the app was on the platform of the device they personally owned. They noted increased anxiety about using the alternate platform’s version.

I really hate that . . . the Apple and Android versions are different. So I’m an Android person and so when I work with a person with an Apple phone it always just takes me longer to help them navigate the app and it has a bit more confusion along with it. I think that makes it more difficult for the patient because it’s more difficult for me.

A barrier to specific feature utilization was a lack of knowledge of all of the features of PE Coach. As noted, most providers had not received formal training on the app and most providers only had partial information about the available features.

Idiosyncratic, negative experiences with the app also created barriers. For example, PE Coach software updates are rare but some historical updates did not accommodate restoration of user data from the previous version. As a result, some providers noted that patients who updated the app during treatment lost data generated during earlier PE sessions. Similarly, patients who replaced phones during treatment had no way to transfer their PE Coach data to their new device and were at risk of losing data stored on their previous phone. A related challenge existed for some patients who did not update their device’s operating system as prompted. Device operating systems that were too old risked incompatibility with PE Coach.

Some providers noted that the convenience of having all treatment related materials in the patient’s phone also had drawbacks. First, some providers reported a preference for a paper archive of completed homework. Having all homework tracking documents and symptom self-reports in the app limited their ability to retain and review a longitudinal history of data generated across treatment (e.g., monitoring symptom reduction). When duplicate paper records were not kept, the provider needed to access the patient’s phone to review previous data. These providers tended to keep paper records of their patients’ data, even as the patient stored their data in the app. Second, in contrast to providers who appreciated
side-by-side collaboration with their patients, some providers reported discomfort handling their patient’s phone in order to collaborate around the use of PE Coach.

Patient comfort with their own device and/or low technology literacy were also potential barriers. When patients were not comfortable or experienced with their device, it risked slowing down sessions or reducing engagement in therapy. For example, during session two, patients create a list of places, situations, circumstances that they avoid because of their traumatic experience for the in vivo hierarchy. With PE Coach, this list is conveniently stored in the app. However, if the patient was not proficient at typing on their mobile device, the time required for generating this list could be excessive.

Some providers reported a challenge regarding adequate time to teach patients how to use the app during therapy sessions. PE is a manualized psychotherapy, meaning there are prescribed tasks to be accomplished each session. There is much to cover and time management is an important skill to successful progress in treatment. Efficient management of the additional tasks required to incorporate PE Coach was reported as a challenge. Providers also noted encountering occasional patients whose mistrust of the government negatively impacted their willingness to use an app designed by DoD/VA.

**Discussion and Future Directions**

PE Coach represents an innovation that has to be adopted by both the patient and the provider. The requirement for dual adoption highlights the importance of facilitators and barriers to both PE providers and their patients. PE providers who were interviewed about how they and their patients use PE Coach identified several factors that facilitated their use of the app, as well as significant barriers to the use of its full range of features. Facilitators to adoption included being introduced to the app by a supervisor, trusted colleague, or during a training experience. Aspects of the app also facilitated adoption and use through enhanced credibility of treatment, convenience of and engagement in completing PE tasks, and provider-patient collaboration. Significant barriers that were noted included technical challenges, differences between the iOS and Android versions of PE Coach, lack of awareness of app features, inability of the provider to readily keep an archive of homework completed (as data from the app cannot be shared), and patients lacking comfort and proficiency using mobile devices.

Although there has been a proliferation of mental health mobile apps on app stores for all device platforms, there is very limited research available about how such apps are being used, including limited information on what impacts clinicians’ decisions to use or not use a particular app and its features. This information is important to facilitate dissemination and implementation of such resources and to support clinicians and their patients to take full advantage of the tools developed. Significant resources go into the design and development of a mobile app and learning how these apps are used can help put these resources to the best use possible.

Previous research suggests that many PE providers in the VA find PE Coach useful and most surveyed intended to use the app with their future PTSD patients (Kuhn et al., 2015). This project provides detailed information about the factors that support providers’ use of PE Coach, and barriers to their use. The value of this information lies in the potential to support clinicians by building upon factors that facilitate use of PE Coach, and mitigate the impact of barriers. For example, at the lowest level of complexity, most providers had no training on PE Coach and limited information about the features available, which served as a barrier to feature use. It is possible that incorporation of information on PE Coach into the existing training programs for PE would go a long way to support clinicians in the implementation of key PE Coach features.

It was also noteworthy that many providers adopted PE Coach after hearing about it from supervisors or peers. Given the importance providers placed on the perceived benefits of PE Coach to their patients, establishing an opportunity for providers to share their patients’ positive experiences using the app may also bear fruit. This may be particularly helpful when the experiences are related to app features that are underutilized.

Provider competence and confidence with behavioral health technologies are critical components of effective implementation (Substance Abuse & Mental Health Services Administration, 2015). Interviews highlighted the importance of technical competence with the app and the potential value of trying features with mock user data in advance of use in clinical practice. Currently, this is done through individual clinicians creating simulated data on their own device as they try out different features. This is time consuming, however, and requires redundant effort by providers to input similar data on an individual basis. It also only enables practice with one platform of the app. Future developments of PE Coach could include a version of the app with hypothetical data already present to allow efficient opportunities to try the app. Alternatively, an Internet-based version of the application could be developed to allow efficient provider testing of both versions of the app.

Interviews suggested that providers perceived their use of PE Coach as helpful to staying on track with the tasks required by the PE treatment protocol. Although not designed specifically as a treatment fidelity intervention, it is possible that adoption of PE Coach improved provider protocol adherence. Future research could evaluate the effectiveness of PE Coach and other mobile applications to support provider competence.

Some barriers to PE Coach use resist easy solutions. There are no simple solutions to a moment when the app crashes or does not operate as designed. While providers patiently wait upon the desired solution, namely, software updates to fix bugs and improve functionality, they can share with one another their clinical experiences and best-practices for responding to such challenges when they occur. Mental health supervisors frequently consult with their providers when there is an unexpected challenge to a patient’s treatment plan. Similar consultation skills may support colleagues clinically considering how to best respond when unexpected technical problems occur. Leveraging clinical consultation or existing team meetings for such mutual support may be time well spent.

It was interesting to note that providers’ participation in this project positively mitigated one of the barriers to PE Coach feature use. Many providers were surprised to learn about helpful features they were not previously aware of as a result of participating in this project and may have adopted additional features simply as a result of increased knowledge. This sheds additional light on interventions that might be helpful to support provider utilization of the full features of a mental health app.
Interviews were specifically focused upon providers’ use of a single mobile application to support treatment during PE. However, a number of the observations noted during this project may have relevance to a wide-range of mobile applications or behavioral health technologies. For example, provider perceptions of advantages for their patients was reported to be a particularly salient facilitator of use. In this project, providers felt the app increased patient privacy and made adherence with some aspects of the homework more convenient. There may be other mental health mobile apps that would share these perceived advantages, which could help facilitate adoption and use. Similarly, many providers simply did not know all of the features available in the app. Behavioral health technologies can be remarkably useful but in the absence of strategies to ensure adequate provider knowledge, any number of apps and their features may go unused.

Although our qualitative method and sample size did not permit it, future research might explore whether there are differences in PE Coach feature use for providers located in different clinical settings. For example, clinicians who work in PTSD subspecialty clinics may have larger PTSD caseloads relative to those in general mental health clinics. This could result in greater experience, familiarity, or comfort with the app and its features. It would also be interesting to explore whether variance in provider attitudes about PE affected app use. Some providers are trained in multiple evidence-based approaches to treating PTSD and provider treatment preferences could relate to aspects of PE Coach use.

There are several limitations to the current project that affect the impact of these results. First, the goal of qualitative methods is to obtain a deep, rich understanding of context and stakeholder perspectives rather than generalizability. Limitations include reliance on self-report rather than observed behaviors and potential influence of interviewers on participant responses. In addition, these results are from interviews with providers at a single VA facility. There may be local factors impacting their experiences and it is not known to what extent these results would be similar to PE providers in other settings. Second, these interviews were not constructed in accordance with any particular implementation framework. Useful models exist such as Promoting Action on Research Implementation in Health Services (PARIHS). Future studies could leverage an existing framework to guide the research. Finally, although many of these findings would appear to have relevance to a wide range of behavioral health mobile apps, it is not known whether similar results would be found for other technologies.

With ongoing worldwide growth in the adoption of mobile devices, opportunities to support patients with mobile apps are likely to expand. PE Coach represents one opportunity to leverage a promising behavioral health technology to support patients. PE is an efficacious treatment and PE Coach may help mitigate some of the challenges to adopting this evidence based treatment. However, the mere development of such an app is not sufficient to ensure feature use. A range of facilitators and barriers impact adoption and their identification presents opportunities for product and process improvement. Accordingly, there is a worthy opportunity. Implementation of innovations is, by its nature, a collaborative endeavor and a range of stakeholders can come together to ensure patients have the best chance of recovering from their traumatic experiences.

References


without clinician support: A pilot randomized controlled trial. General Hospital Psychiatry, 38, 94–98.


