A SMARTPHONE APPLICATION FOR THE TREATMENT OF
GENERALIZED ANXIETY DISORDER

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By
Jeremy Tyler Schwob

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Dayton, Ohio
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A SMARTPHONE APPLICATION FOR THE TREATMENT OF
GENERALIZED ANXIETY DISORDER

Name: Schwob, Jeremy Tyler

APPROVED BY:

__________________________________
Jackson A. Goodnight, Ph.D
Faculty Advisor

__________________________________
Catherine J. Zois, Ph.D
Committee Member

__________________________________
Lee R. Dunham, MSW, LISW-S
Committee Member

Concurrence:

__________________________________
Keri Brown Kirschman, Ph.D
Chair, Department of Psychology
ABSTRACT

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Name: Schwob, Jeremy Tyler
University of Dayton

Advisor: Dr. Jackson A. Goodnight

The current study aimed to evaluate the acceptability and effectiveness of a smartphone application in the treatment Generalized Anxiety Disorder (GAD). Cognitive-behavioral therapy (CBT) is commonly used to manage and minimize the aversive symptoms of GAD; however, studies have found only modest treatment gains when CBT is used alone (Brown et al., 2001). Further, GAD has been identified as the least successfully treated of the anxiety disorders (Newman et al., 2013). Previous studies have measured client acceptability of smartphone applications (Ainsworth et al., 2013; Pramana et al., 2013), but they have failed to measure the impact of the application on treatment outcomes (e.g., reductions in symptom severity). To fill this gap in the literature, the current study compared therapists using their treatment as usual (TAU; typically CBT) plus inclusion of the smartphone application (TAU+app) to two alternative treatment conditions: TAU plus the addition of a paper log for daily assessment of client data (TAU+paper), and treatment as usual alone (TAU). The current study tested the hypothesis that the
integration of a cognitive-behavioral based smartphone application will produce greater reductions in anxiety by facilitating a better quality of communication between therapist and client, strengthening the quality of the therapeutic alliance, promoting skill acquisition, and providing more data regarding client progress. All participants completed dependent measures of anxiety, depression, global functioning and therapeutic alliance at each scheduled appointment during the 6 weeks of the study (the within subjects factor). While all three treatment conditions experienced decreases in anxiety from pretreatment to end treatment, there were no significant differences between conditions on measures of anxiety or therapeutic alliance. Further, although compliance rates were higher for the TAU+paper condition than the TAU+app condition, ratings of usefulness in therapy were higher for the TAU+app condition. Future directions regarding alterations to the smartphone application, efforts to increase compliance and interest, additional training for therapists, and overall implementation are discussed.

Keywords: smartphone application, cognitive-behavioral therapy, treatment outcomes, anxiety, depression, therapeutic alliance.
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CHAPTER I
INTRODUCTION

Generalized Anxiety Disorder (GAD) is a common anxiety disorder characterized by excessive anxiety or worry about a number of events or activities that cause significant distress for the individual. The Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-5; American Psychiatric Association, 2013) states that the 12-month prevalence of GAD in the United States is 2.9% among adults. A diagnosis of GAD is commonly comorbid with a diagnosis of depression or another anxiety disorder, increasing the severity of mental illness. The most frequently occurring symptom of GAD is the inability to relax, presenting itself in 96.6% of cases (Beck, 1985).

Unfortunately, a significant minority of individuals suffering from GAD do not respond to psychological treatment, and many who do respond do not experience complete remission of symptoms (Borkovec, Newman & Castonguay, 2003). GAD has been identified as the least successfully treated of the anxiety disorders (Newman, Llera, Erickson, Przeworski, and Castonguay, 2013). This difficulty appears to be the result of maladaptive attempts to handle contrasting emotions and emotional shifts, while primarily using the above mentioned worry as coping (Newman et al., 2013). Researchers have begun to investigate the potential for enhancing psychosocial treatments through the use of modern technology, such as smartphone applications (Palmier-Claus et al., 2012; Palmier-Claus et al., 2013; Ainsworth et al., 2013; Pramana
et al., 2013). However, there has been very little research evaluating whether modern technology improves the therapeutic process and outcomes for GAD, specifically, or whether the use of smartphone applications produces better treatment outcomes than treatment as usual. The current study addressed this gap by developing and evaluating a smartphone application intended to enhance the treatment of GAD using elements of cognitive-behavioral therapy (CBT).

**Cognitive Behavioral Therapy for GAD.** CBT is commonly used to manage and minimize the aversive symptoms of GAD. When encountering an anxiety-producing situation, people with GAD frequently use maladaptive coping, such as cognitive and behavioral avoidance (Borkovec, Shadick & Hopkins, 1991; Butler, Fennel, Robson & Gelder, 1991). CBT relies on replacing these maladaptive responses with more beneficial methods of coping. Critical to the replacement of maladaptive coping responses is increased awareness of their presence and their role in maintaining anxiety. Newman and Borkovec’s (1995) implementation of CBT directed patients toward acknowledging shifts in anxiety levels, which they could then discuss in therapy. The increased awareness of anxious thoughts and feelings provided the opportunity to find effective coping responses, which help prevent and or/reduce the severity of worrying. An important skill learned during CBT is self-monitoring anxious tendencies, supported by homework assignments (e.g., journaling or worksheets) geared toward developing and generalizing this skill.

In addition to promoting effective self-monitoring, CBT for the treatment of anxiety often addresses motivation, cognitive restructuring, relaxation and exposure (Rapee et al., 2000). Motivation is an important characteristic of CBT, as clients rely on
a therapist to help improve understanding and engagement by mapping out how the components of treatment address the anxious symptoms. Cognitive restructuring involves altering unrealistic, problematic thought patterns, which over time contribute to improvement of symptoms of anxiety in adults (Foa et al., 1996). Anxiety in adults has also been treated effectively by the use of muscle relaxation (Borkovec and Costello, 1993), as muscle tension is a core physiological component of GAD. After receiving training in cognitive restructuring and relaxation procedures, clients are exposed to stressful stimuli (e.g., thoughts about future negative events) while practicing their newly acquired coping skills (Rapee et al., 2000).

The most effective treatments for anxiety disorders include tactics focused on targeting the key feature of the disorder (e.g., panic control treatment for Panic Disorder; Craske & Barlow, 2008). Desiring an intervention with more beneficial results for GAD, Brown and colleagues (2001) designed a new biopsychosocial treatment that exposes patients by processing moments that have created excessive, uncontrollable worry. The program required weekly, hour-long sessions over the course of three to four months and focused on the three components of a biopsychosocial treatment involving physiological, cognitive, and behavioral. The physiological component consisted of progressive muscle relaxation (PMR) training. The idea of cognitive restructuring comprised the cognitive aspect of the treatment model. The behavioral component consisted of worry behavior prevention, problem solving and time management. An important tool that Brown and colleagues (2001) used for processing worry was the Cognitive Self-Monitoring Form, allowing a patient (with help from the therapist) to identify their level of anxiety and methods of coping. Participants found the Cognitive Self-Monitoring Form to be one of
the most helpful tools in the alteration of their anxious thoughts, suggesting that identifying ways to improve compliance with self-monitoring could enhance the efficacy of CBT.

**Accessibility of CBT.** Although benefits of CBT have been noted, an examination of various studies has found only modest treatment gains for GAD were produced from traditional CBT alone (Brown et al., 2001). Portable computer based technology has the potential to enhance clients’ acquisition of CBT techniques for managing anxiety, to reduce intervention duration and promote skill development outside of session. The most frequent utilization of portable devices in psychological research involves self-reported scale ratings completed periodically throughout the day within real-world settings (Csikszentmihalyi & Larson, 1987). Previous research into portable device assessment measures has relied on Personalized Digital Assistants (PDAs; Kimhy & Corcoran, 2008; Swendsen et al., 2011). PDA devices have been well-received by participants and show increases in assignment completion, which can then contribute to benefits in treatment (Kimhy & Corcoran, 2008). Portable palmtop computers have also been shown to be effective in decreasing symptoms of GAD when integrated into CBT, retaining a lower frequency of occurrence after 6 months (Newman et al., 1999). However, the convenience and widespread adoption of smartphone technology has highlighted the obtrusive nature of carrying an additional PDA, limiting the usefulness of PDAs.

**Smartphone Technology in Clinical Settings.** Smartphone technology offers a more convenient and less obtrusive way to use technology to aid in the treatment of CBT. With 3.6 billion current unique users of mobile phones worldwide and 2.6 billion of those
being smartphone users (GSMA, 2015), the expanding influence of smartphone mobile technology has the potential to modernize self-monitoring of clinical information and enhance its utilization in treatment. An individual’s smartphone provides an ease of access to applications that could be used in conjunction with conventional psychological treatment. By 2020, it is expected that worldwide smartphone use is to increase to 5.9 billion (GSMA, 2015).

Research has begun to show potential for smartphone applications to aid in psychological treatment. Ainsworth and colleagues (2013) compared a newly developed, mobile phone-based assessment application to previously used portable device technology. Individuals with schizophrenia answered feeling and mood assessment questionnaires for 6 days (4 reports per day). The researchers found that 71% of participants reported that the smartphone application was easier to use, and 67% of participants preferred it in comparison to a text message report condition. Compliance also appears to be high with smartphone applications. Two studies (Palmier-Claus et al., 2012; Ainsworth et al., 2013) found that participant compliance with smartphone self-report was 82% and 88%, respectively. These rates show that smartphone application assessment have the potential to enhance intervention-focused assessment in community-based treatment settings, where treatment noncompliance and attrition are common.

Other research has begun to evaluate the effects of smartphone applications as integrated with CBT for anxiety. A pilot study by Pramana and colleagues (2013) successfully integrated a smartphone application based on CBT strategies with brief CBT (BCBT; totaling 8 sessions) for the treatment of child anxiety. The integrative treatment involved both BCBT and the use of the smartphone application that cued the participants
to use CBT skills taught previously and allowed participants to receive feedback from therapists in real-time. They found that the application could be incorporated into a modified form of CBT based on high rates of compliance. However, this study did not compare the integrative treatment to BCBT alone. Therefore, it is unclear whether smartphone application improved treatment outcomes.

Thus far, research has shown portable device assessment to be effective for the treatment of GAD when integrated into the therapeutic process (e.g., CBT; Newman et al., 1999), but it appears that patient compliance with older, non-smartphone devices is limited, perhaps due to the inconvenience of carrying a single-purpose device (e.g., Ainsworth et al., 2013). Other research has focused on evaluating the acceptability and feasibility of smartphone applications for the support of CBT for anxiety (Pramana et al., 2013), showing that clients respond positively and are highly compliant in their use of the technology. With smartphone technology being ingrained in the daily lives of much the general population, it has been suggested that not utilizing this technology in modern psychological practice could be considered “scientific malpractice” (Miller, 2012). This statement, however, assumes that smartphone technology improves treatment outcomes or facilitates the therapeutic process in some other way, both of which have yet to be demonstrated empirically. The current study will provide a preliminary evaluation of the efficacy of smartphone technology for enhancing the treatment of anxiety.

**Feedback for Clients in Therapy.** There is reason to believe that enhancing ongoing assessment in psychotherapy has the potential to improve treatment outcomes. Feedback between a client and therapist is essential for the establishment of rapport and the eventual strengthening of the therapeutic alliance in psychotherapy. A meta-analysis
studi ng the influence of formal progress monitoring in therapy found that clients who have an initial negative response (and were therefore “at risk” to have little or no benefit from therapy) showed improved outcomes from psychotherapy when provided descriptive feedback (i.e., progress graphs and warnings) from their therapist (Lambert, Whipple, Hawkins, Vermeesch, Nielsen and Smart, 2003). Shimokawa, Lambert and Smart (2010) concluded from an additional meta-analysis that these enhancements are also found for clients who were not labeled as “at risk to terminate therapy,” although not to the degree found in clients that are “at risk.”

Another study (Whipple, Lambert, Vermeesch, Smart, Nielsen and Hawkins, 2003) found that, in comparison to a control group of clients receiving no feedback, nearly twice as many clients receiving feedback and client support tools (CSTs) achieved clinically significant improvements in therapeutic relationship, motivation to change, and social support network. By integrating technology into therapy, the availability of feedback for both the client and therapist could be increased. Increasing the tracking and access to feedback in turn could drastically increase the already significant improvements in the therapeutic relations that were previously noted from increased feedback itself.

**Treatment Compliance and the Therapeutic Alliance.** The development of strategies to increase clients’ compliance with between-session tasks (e.g., homework) is important for promoting the mastery of skills learned in treatment (Kazantzis, Datillio and MacEwan, 2005). Further, studies have shown that therapy that involves the integration of homework assignments produces a greater effect in comparison to therapy that does not (Kazantizis, 2000; Kazantzis, Deane, and Ronan, 2000). Another study conducted by Cox, Tisdelle and Culbert (1998), showed that written copies of therapist
assigned homework significantly increased individuals’ compliance with therapy. Malouff and Schutte (2004) identified six conditions that promote compliance with homework tasks, two of which could be promoted with a smartphone application. First, the client must have the opportunity to complete the task assigned to them. This, for instance, could be addressed by the tendency of individuals living in a technology-dependent culture to have smartphone device on their person almost at all times. Second, the client must remember to complete the homework assigned. In a growing culture of smartphone attachment throughout the day, it becomes the ideal medium to assist with remembering and completing homework, leading to increased treatment compliance. A different study found that homework compliance was positively related to the therapist reviewing the homework assignment in therapy (Bryant, Simons and Thase, 1999).

Multiple studies (Conoley, Padula, Payton and Daniels, 1994; Scheel, Hoggan, Willie, McDonald and Tonin, 1998) have investigated client attitudes toward homework and how they influence compliance. Various client concerns were identified, including: the perceived benefits of the assignment, the difficulty of assignment completion (e.g., time required, effort expended, and complexity of the task), the degree to which the assignment builds on the skills the client already possesses or is learning, and the degree of support and encouragement the therapist provides (Conoley et al., 1994; Scheel et al., 1998). Smartphone applications have the ability to address these concerns by building on the delivery method of traditional homework assignment (i.e., working from memory or the using paper instructions/reminders). When designed in a user-friendly way, smartphone applications can deliver a simple line of questioning that can take a matter of minutes to complete. Repeated collection of these responses could create a rich database
of client experiences, thoughts, feelings and coping occurring outside of therapy to assist with therapist tracking of skill development discussed in session.

Another potentially important aspect of promoting client compliance is the degree to which the client is both ready and confident to make changes in their anxiety (i.e., readiness for change). Malouff and Schutte (2004) identified client self-efficacy and motivation as important to overcoming obstacles to the completion of homework assignments. As previously mentioned, smartphone applications present the opportunity to engage an increasingly technology driven culture. By creating and integrating this advanced tool, smartphone applications could highlight the familiarity and comfort the general public possesses toward technology, and encourage both increased participation and compliance of clients to their treatment outside of sessions. By helping to advance therapy tools in a modern way drawing on the familiarity of users with technology, client motivation toward engagement in therapy could potentially increase.

The therapeutic alliance may also benefit from the integration of a smartphone application into treatment. Detweiler-Bedell and Whisman (2005) reviewed homework assignment discussions between therapists and clients and found improved treatment outcomes to be associated with therapist behaviors (i.e., establishment of concrete goals and identification of barriers), homework characteristics (i.e., use of reminders to complete the homework tasks), and the client being involved in review of the homework. Additionally, Kazantzis and colleagues (2005) note that persistent failure to complete homework is typically an indicator of a rupture or void in communication between client and therapist, and successful therapy requires both an awareness and willingness for collaboration in the utility of assigned tasks. Integrating a smartphone application that
optimizes beneficial strategies identified by Detweiler-Bedell and Whisman (2005) could facilitate both the completion and review of homework tasks, while also strengthening the therapeutic relationship and promoting improved treatment outcomes.

Currently, the general public has limited access to smartphone applications that provide assessment for anxiety. The applications that are available for purchase tend to only target a few specific components. A few programs have been developed (e.g., McMinn’s “Therapy Outcome Management System (TOMS)”; “adult CBT*ABC way” by TikalBayTek, Inc.) that highlight potentially beneficial components to add to the therapeutic process. The TOMS promotes the use of their application, which tracks scores on the Outcome Rating Scale (ORS) and the Session Rating Scale (SRS) to create a graph. This graph hopes to provide instant feedback on client progress in therapy, track the progress of the therapeutic alliance, and use feedback to help guide future sessions. Therefore feedback presented to the client could show the previously mentioned benefits in treatment (Lambert et al., 2003; Shimokawa et al., 2010). Although this may be a beneficial component of an application that may add to the therapeutic process, there appears to be no current research data utilizing these applications. Additionally, there are extensions to the feedback that could be provided to the client (e.g., progress on self-ratings of anxiety) to show additional benefits. A few more recent applications address triggers to anxious thoughts and gaining a deeper understanding of anxiety; however, these are in the form of self-help (i.e., Worry Watch or Self-Help for Anxiety Management (SAM). A final category of available applications focuses on the use of audio tracks for relaxation (i.e., Stop Panic & Anxiety Help; Relax & Rest Guided Meditations; and Nature Sounds Relax and Sleep). While each of these applications may
target one specific area, they lack a combination of items that could extend what is learned in treatment and could enhance therapist-client interactions around skill development and monitoring of anxiety.

Although compliance rates for smartphone applications have been examined in a previous study (Ainsworth et al., 2013), the effect of enhancing compliance through the use of a smartphone application has not. In review of the literature to this date, no previous study to my knowledge has examined treatment outcomes in comparison to a current application for anxiety. Additionally, no study has examined the mediators for the acceptance of the smartphone application in therapy to achieve these changes in treatment outcome. The current study hoped to extend the literature by examining the effects of a smartphone application on several intermediate outcomes (i.e., compliance, feedback and therapeutic alliance), and examining whether improvements in these intermediate outcomes lead to improvements in symptoms reduction relative to treatment as usual.

**Current Study**

The current study utilized a smartphone application technology to collect data to facilitate increased awareness of the severity, triggers, and coping responses related to the key component of worry in GAD (Beck, 1985). The objectives of the current project were to develop a smartphone application to enhance treatment of GAD and to evaluate its effectiveness and acceptability to clients. The current study compared treatment as usual (TAU) plus the smartphone application (TAU+app) to two alternative treatment
conditions: TAU plus the addition of a paper log for daily assessment of client data (TAU+paper), and TAU without any additional intervention components (TAU).

The smartphone application was developed with features thought to promote superior performance over the paper log intervention. First, the smartphone application presents more user-friendly navigation through an automated question tree presentation tailored to the individual’s response in a way that cannot be accomplished efficiently with a paper and pencil presentation. Second, the reminder alert to begin the daily report is intended to promote greater response compliance (Detweiler-Bedell and Whisman, 2005; Malouff and Schutte, 2004) and support the development of a routine for the completion of the reports. Finally, the unique capability of the smartphone application to automatically compile and summarize data from daily reports is intended to promote easier and more effective of review of progress in session. These aspects of the application should promote improved communication and higher rates of compliance with daily assessments, contributing to improved engagement in therapy, faster acquisition of therapeutic skills, and a stronger therapeutic alliance. The following hypotheses were tested:

1. In comparison to both alternative treatment conditions (TAU and TAU+paper), clients in the TAU+app condition will report fewer symptoms of anxiety over time as measured by the Penn State Worry Questionnaire (PSWQ; Meyer et al., 1990) and the GAD-7 (Spitzer et al., 2006) and will report a better working alliance with the therapist (e.g., better quality of communication with therapist and increased engagement in therapy).
2. In comparison to the TAU+paper condition specifically, clients in the TAU+app will show greater rates of compliance with daily assessments, thus providing more data points to be used in psychotherapy, and greater perceived usefulness of assessment procedures. Also, therapists will rate the TAU+app as more useful in session. Higher compliance rates are expected to be a result of ease of use of the smartphone application (TAU+app) in comparison to the TAU+paper condition due to various factors.

3. The lower rates of anxiety hypothesized above for the TAU+app condition will be explained by higher assessment compliance rates, increased working alliance, and therapists’ report of client skill acquisition and treatment engagement, as these factors have been found to predict improved treatment outcomes (Bryant et al., 1999; Cox et al., 1988; Detweiler-Bedell & Whisman, 2005; Kazantzis, 2000; Kazantzis, Deane, and Ronan, 2000; Kazantzis et al., 2005; Lambert et al., 2003; Whipple et al., 2003).
CHAPTER II

METHOD

Participants

19 individuals meeting or having met criteria for a primary or secondary diagnosis of Generalized Anxiety Disorder (300.02) according to the DSM-5 (American Psychological Association, 2013) were recruited for the current study from a mental health agency serving the Dayton, Ohio region. In total, 13 participants completed the current study, representing 68% of those enrolled in the study (n = 19). By the completion of the study, 6 participants had removed themselves from the study or had been determined to be non-completers of the study due to failure to attend treatment sessions. Clients who removed themselves from the study cited a work (i.e., night-shift) conflict with task completion, failure to complete entries, and loss of smartphone device and paper packets, as reasons for terminating their participation. Among the initial sample of 19 participants, ages ranged from 24 to 60 years (M = 41.21, SD = 10.46), and race categories were 89.5% “white,” 5.3% “black,” and 5.3% “other.” The sample of 19 consisted of 21.1% men and 78.9% women, and the socio-economic status (SES) indicated by the individual’s billing method was 84.2% “Medicaid,” 5.3% “MACSIS,” and 10.5% “Medicaid/MACSIS.” The 19 participants’ time in treatment with their therapist ranged from 4 weeks to 144 weeks (M = 76.24, SD = 39.75). Attrition analyses showed that that 6 clients who terminated their participation were in treatment with their therapist for a shorter period of time (M = 36.50, SD = 27.91) when compared to the 13
clients who completed the study \((M = 88.46, SD = 34.98)\), \(t(15) = -2.67, p < .05\). No other significant differences were found between completers and non-completers.

All participants were at least 18 years of age and provided informed consent to enroll in the study. Participants either owned a smartphone or were provided a smartphone for the duration of the study (these categories were evenly dispersed across groups) to control for possible differences in outcomes related to having access to a smartphone. Active status in therapy with a clinician or therapist was required.

Exclusion criteria included history of suicide attempt and organic or substance induced psychosis. These criteria, which are consistent with typical exclusionary criteria (Newman et al., 1999), were chosen to eliminate individuals from the sample who are at elevated risk for self-harm/suicidality and/or exhibit severe psychopathology, and as a result are not well-suited for intervention research that is not designed to address these factors. Individuals meeting the eligibility requirements were provided the opportunity to participate in the research if their therapist had chosen to participate. Analysis of responses from the Therapist Modality Questionnaire (TMQ; a measure designed by the researchers for the purposes of the current study) showed that all therapists across conditions who completed the form \((n=17)\) reported using CBT with their client. Several other treatment modalities were also reported. Relaxation training was identified as being used with 71.4% of clients in the TAU+app condition, 60% of clients in the TAU+paper condition, and 60% of clients in the TAU condition. Additionally, Cognitive therapy was reported as being used with 57%, 80%, and 60% for the TAU+app, TAU+paper, and TAU conditions, respectively. Only the TAU+app condition contained therapists (30%) that performed group therapy with their clients involved in the study.
Due to the confidential nature of client treatment at the community mental health center, all participants were assigned an identification number. This list of client IDs and participant numbers were kept in a locked file cabinet at the community mental health center with access granted only to the researchers and associated therapists. IRB approval was obtained before the study was initiated.

Procedure

After eligible client participants were identified, the therapists working with those clients were invited to participate and were given the consent form provided in Appendix A. Therapists who chose to participate attended a presentation describing how the smartphone and paper logs were to be used and how they were to be introduced to the participating clients. Therapists were given the opportunity to use the application and paper log and ask any questions about their participation in the study.

Eligible client participants were approached at the beginning of a session, outside the presence of the therapist, using the consent form provided in Appendix B. Participants were given the option to have the consent form read out loud. Each client who consented to participate was randomly assigned to one of the three following conditions: (1) clients who reported symptoms on a smartphone application at least one time per day while they received treatment as usual (TAU+app), (2) clients who reported the same data collected in the application but used a paper log instead, while they received treatment as usual (TAU+paper), and (3) clients who only received treatment as usual (TAU-only). “Usual” treatment entailed having an active status in talk therapy with a therapist or clinician. Participants in the TAU+app condition practiced using the smartphone application following the consent process, as well as with their therapists in
session. Similarly, participants in the TAU+paper condition were walked through the process of completing paper report by the researcher and then by their therapist.

All participants (regardless of condition) were provided a smartphone by the researcher and activated through the Tracfone wireless service. The Tracfone service was activated by the researcher with an allotment of minutes, texts, data, and unlimited WIFI accessibility. Once the phones were activated and fully charged, the researcher placed them in an envelope with a phone charger, instructional manual and simplified directions on how to unlock the phone, navigate, and utilize the application (if in the TAU+app condition). Participants were provided a smartphone for the 6 week smartphone data collection period of the study. After that period, the smartphones were returned. If the participant was assigned to either the TAU or TAU+paper condition for the six-week data collection period, the phone was offered and redistributed with the application on the phone, as to not withhold potential benefits based on random assignment in the TAU+app condition.

Participants randomly assigned to the TAU+app condition recorded their responses to questions on a smartphone device. The current study’s smartphone application is designed around the CBT components utilized by Rapee and colleagues (2000) described above, as it is intended to help facilitate clients’ progression in CBT. The client participant was asked to provide (1) a rating of worry (2) a description of specific experiences of high and low anxiety, and (3) a list of coping techniques used to combat anxiety, as described in detail below. The reports were intended to provide opportunities for the participant to monitor symptoms, thoughts, and feelings, to practice and reflect on coping strategies, and for the therapist to review these reports with clients.
Client responses were recorded using a self-report smartphone application developed for use on phones using the Android operating system. Once per evening a notification would appear to alert the participant that it was time to complete the daily assessment. The participant had the option to “Begin” the evening assessment, or select a “Snooze” option to delay the assessment for 15 minutes. They also were notified that they should not complete the assessment at this time if they are engaged in an activity (e.g., driving) that requires their full attention. After 15 minutes had elapsed, the client had the option to “Begin” the assessment, “Snooze” for 15 more minutes or “Dismiss” if they chose not to complete the day’s assessment.

After a client began the daily reflection, the first screen to appear asked the question, “In the past 24 hours, what was your anxiety level at the most severe moment?,” to which participants would respond on a 0 (no anxiety) to 7 (extreme anxiety) sliding scale with descriptors at the endpoints. This first screen provided the opportunity to report symptoms, helping with recognition of symptomology and interpretation of severity. The second screen was determined by the response on the first screen. A response of 0 or 1 on the first screen prompted the client to, “Describe what kept your anxiety low,” and provided a text box with a maximum of 140 characters allotted for typing. A response of 2 or higher prompted the client to, “Describe what made you feel anxious.” The third screen asked about the person’s thoughts and feelings during the experience of highest anxiety by asking, “What thoughts were you having at the time?” and “What feelings were you having at the time?,” with a checklist of feeling words (e.g., sad, angry, calm, worried, scared, etc.) shown below. The fourth screen was
also determined by the participants’ initial anxiety rating on the first screen. A response of 0 or 1 on the first screen (low anxiety range) resulted in the client being asked, “What did you do to keep your anxiety low?” In contrast, a response of 2 or higher on the first screen resulted in the client being asked, “What did you try to do to reduce your anxiety?” The fifth screen to be presented to participant asked “What was your level of anxiety after you tried dealing with it?,” to which participants made a rating from 0 (not at all) to 7 (very well). This was the final screen presented during the daily assessment if participants provided a rating between 0 and 4 to this question. In contrast, a response to this question between 5 and 7 led to a sixth and final screen asking, “What would you do next time?,” where the same list of potential coping strategies was presented to offer alternative options for the client to consider.

The lists of feeling words and coping responses presented as response options on the third (feelings) and fourth (coping responses) screens were prepopulated with a variety of feeling words and a variety of coping activities (e.g., breathing exercises) that are frequently taught in therapy for anxiety disorders. In addition, the lists of feeling words and coping responses could have been expanded and personalized by client and therapist at the time the smartphone application was first introduced and trialed in session. Finally, the list of feeling words and coping responses w expanded each time a client added a new response when completing the daily assessment throughout the six-week intervention period. A flowchart with the question and response sequences described above is presented in Appendix C. Additionally, the progression of smartphone application screens encountered during the series of questions is presented in Appendix D. The same series of questions was asked to those completing paper forms,
and clients were instructed to complete the paper forms at the same time (e.g., 8:00 p.m.) every evening.

In addition to completing the daily reflection assessment described above, client participants in the TAU+app and TAU+paper conditions were able to create additional spontaneous entries whenever they chose. The questions were the same as those encountered during the daily reflection assessment, except that the spontaneous entries reference the current moment (e.g., “How worried are you right now?”) rather than asking the client to consider a moment during the past 24 hours. In addition, when adding a spontaneous entry, if a participant in the smartphone condition answered a 6 or 7 (the two highest ratings) in response to the first question pertaining to their level of anxiety in the moment, they were prompted with a pop up screen stating, “If this is an emergency, please call Crisis Care,” followed by two choices: “Call” or “Dismiss.” Also different from the daily reflection, if a participant completing a spontaneous entry answered with a 0 or a 1 (the two lowest ratings) to the first question about their anxiety in the moment, they were directed to a modified second screen instructing the participant to “describe what is keeping your anxiety low,” rather than describing their symptoms and the situation that may have caused their anxiety. Following the modified second screen and a third screen about thoughts and feelings, those with a 0 or 1 rating were directed to a modified fourth screen that presented coping strategies with the question, “What are some things you have done?” A flowchart representing these questions is presented in Appendix E. Additionally, the progression of smartphone application screens seen by the participant in this condition is in Appendix F. Those in the TAU+paper condition completed a spontaneous entry following the same sequence of
questions as noted above for the TAU+app condition, but used a paper log (see Appendix G for Daily Report and Appendix H for Free Entry) rather than the smartphone application.

For the protection of the participants’ personal data, the participants’ responses in the TAU+app condition were stored on the smartphone device rather than being uploaded through a potentially insecure wireless transmission, and only downloaded at the conclusion of the six-week data collection period. The information collected using the smartphone application (in summary form called “View History” as shown in Appendix I) or paper log was reviewed by therapists and clients in session to identify client successes and challenges in regard to symptom severity, triggers of anxiety, and coping responses. Thought challenging and replacing of unwanted thoughts, which are important aspects of CBT, were not included in the current application for simplicity and broad application. The omission for broad application across client participants provided power to the therapist to utilize thought challenging in addition to application, depending on the stage the client resided in treatment (i.e., whether or not they have acquired or practiced the skill).

Client participants assigned to the TAU condition did not complete daily or spontaneous assessments. However, client participants from all conditions, including the TAU condition, completed other questionnaires described below, including: assessments of anxiety and depression before each therapy session in week 1 (pre-intervention), weeks 2-5 (during intervention), week 6 (post intervention), and week 10 (follow-up); an assessment relating to the clients experiences in and satisfaction with therapy before session on week 6 (post intervention); and assessments of global functioning and
therapeutic alliance before session on week 1 (pre-intervention), week 6 (post-intervention), and week 10 (follow-up). All measures were in the public domain, other than those created by the research team for the purposes of this study. This battery of measures was administered by the receptionists at the mental health agency who checked-in clients before sessions. The receptionists at the mental health agency were also responsible for placing completed questionnaires in a locked filing cabinet.

In addition to reviewing client anxiety data collected via daily report in session (for clients in TAU+app and TAU+paper conditions), therapists completed several questionnaires during the study period, including: a therapist modality questionnaire at week 1 (pre-intervention); an assessment relating to therapist experiences in therapy on week 6 (post intervention); and an assessment of therapeutic alliance at week 1 (pre-intervention), week 6 (post-intervention), and week 10 (follow-up). The researcher was responsible for administering questionnaires to the therapist participants.

**Measures**

**Anxiety.** Client participants completed the Penn State Worry Questionnaire (PSWQ; Meyer et al., 1990) on week 1 (pre-intervention), weeks 2-5 (during intervention), week 6 (post-intervention), and week 10 (follow-up). The PSWQ is a commonly utilized measure of worry. Responses to the 16 items on the PSWQ are scored on a 5-point scale, ranging from 1 (“Not at all typical of me”) to 5 (“Very typical of me;” (Meyer et al., 1990). The PSWQ has shown reliability (measured between $\alpha = .86 - .91$) in previous research (Brown, Antony and Barlow, 1992; Dear et al., 2011). The Cronbach’s alpha for the PSWQ in the current study was .92. The PSWQ can be found in Appendix J.
Client participants also completed the Generalized Anxiety Disorder-7 (GAD-7; Spitzer et al., 2006) on the same schedule noted for the PSWQ. The GAD-7 is commonly used in clinical and research settings to determine the presence and frequency of GAD symptoms. The 7-item measure uses a 4-point response scale ranging from 0 (“Not at all sure”) to 3 (“Nearly every day;” Spitzer et al., 2006). Following the prompt, “Over the last 2 weeks, how often have you been bothered by the following problems?” the participant would be presented with one of seven statements (e.g., “Feeling nervous, anxious, or on edge;” Spitzer et al., 2006). The internal reliability of the GAD-7 is very high (α = .92), and the test-retest reliability is also high at .83 (Spitzer et al., 2006). Scoring a 10 on the GAD-7 has been consistent with a DSM diagnosis of GAD (Spitzer et al., 2006). The Cronbach’s alpha for the GAD-7 in the current study was .92. The GAD-7 can be found in Appendix K.

**Depression.** Due to the frequently comorbid symptoms (or even diagnosis) of depression with anxiety, participants also completed the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977) on week 1 (pre-intervention), weeks 2-5 (during intervention), week 6 (post intervention), and week 10 (follow-up). The CES-D is a commonly used measure to collect self-report symptoms to indicate the severity of depressive symptoms. The 20-item measure of the CES-D scores the responses on a 4-point scale ranging from 0 (“Rarely”) to 3 (“Most or all of the time”). After the instructions, “How often this past week did you,” the participant would be presented with a statements to rate (e.g., “I enjoyed life;” Radloff, 1977). A score of 16 or higher has been suggested as a threshold for determining the ratings of a depressed participant (Radloff, 1977). The CES-D scale has been determined to be a useful measure with
strong reliability, sharing correlations of .54 with the Hamilton Clinician’s Rating scale at admission and up to .75 after 4 weeks (Radloff, 1977). Additionally, the CES-D scale has shown strong validity (measured between $\alpha = .85 - .90$), and factor structure in various settings (Radloff, 1977). The Cronbach’s alpha for the CES-D in the current study was .87. The CES-D can be found in Appendix L.

**Global Functioning.** Participants completed the Symptom Checklist (SCL-27-plus; Hardt, 2008) at week 1 (pre-intervention), week 6 (post-intervention), and week 10 (post-intervention), as a brief measure of various mental health problems. Responses to the 27 items on the SCL-27-plus are scored on a 5-point scale, ranging from “never” to “very often;” (Hardt, 2008). The SCL-27-plus has been determined to be a reliable measure ($\alpha = .90$), and shares a .80 correlation with the previous SCL-27, which is representative of the SCL-90-R (Hardt, 2008). The Cronbach’s alpha for the SCL-27 in the current study was .94. The SCL-27-plus can be found in Appendix M.

**Therapist Modality.** For the purposes of this study, a brief questionnaire was developed by the researchers to be completed by all therapist participants in week 1 (pre-intervention). The Therapist Modality Questionnaire (TMQ) assesses the degree to which therapists adhere to a variety of possible therapy modalities and strategies. The therapists responded to 11 questions (e.g., “How often do you discuss negative thoughts with this client”) using a 7-point scale ranging from 1 (“Never”) to 3 (“Always”). The TMQ can be found in Appendix N.

**Therapeutic Alliance.** Client and therapist participants completed a shortened (12-item) version of the Working Alliance Inventory (WAI-SR; Munder et al., 2010) on week 1 (pre-intervention), week 6 (post-intervention), and at week 10 (follow-up) as a
measure of the working therapeutic alliance between the client and therapist. Participants and therapists completed the WAI-SR (Client) or WAI-SR (Therapist), respectively. The measure uses a 7-point response scale ranging from 1 (“Never”) to 7 (“Always;”) (Munder et al., 2010). After the instructions, “On the following page there are sentences that describe some of the different ways you might think or feel about your (counselor/client),” the individual will be presented with a statement (e.g., “I have no doubts about what we are trying to accomplish in counseling;”) (Munder et al., 2010). The short form WAI-SR scale possesses strong reliability ($\alpha = .80$) and validity, and is considered to be a useful measure of the therapeutic alliance (Munder et al., 2010). The Cronbach’s alpha for the client form of the WAI-SR in the current study was .86. The WAI-SR (Client) can be found in Appendix O. The Cronbach’s alpha for the therapist form of the WAI-SR in the current study was .92. The WAI-SR (Therapist) can be found in Appendix P.

**Therapist and Client Perceptions of Satisfaction, Skill Development, and Engagement.** For the purposes of this study, two brief questionnaires were developed by the researchers to be completed by client and therapist participants at week 6 (post-intervention). Participants completed an About Your Experience Questionnaire (AYEQ) to determine areas of satisfaction with their assigned task (application or paper reports) and their perceived ability to recall anxiety levels and coping responses during the previous week. The 6-item measure of the AYEQ scores the responses on a 4-point scale ranging from 0 (“Not at all”) to 3 (“Very much”). An example of a question to be presented is, “How easy was it during your therapy sessions to remember moments when you worried?” Cronbach’s alpha for the AYEQ in the current study was .97. The AYEQ
can be found in Appendix Q.

The therapist completed an About Their Experience Questionnaire (ATEQ) to determine the participant’s skill acquisition and treatment engagement. The 4-item measure of the ATEQ scores the responses on a 4-point scale ranging from 0 (“Not at all”) to 3 (“Very much”). An example of a question is, “How well were new coping skills obtained by the client?” Cronbach’s alpha for the ATEQ in the current study was .94. The ATEQ can be found in Appendix R.

**Compliance.** Compliance with the daily assessments was determined by calculating the percentage of daily assessments completed by participants in the TAU+app and TAU+paper during the six-week period.

**Readiness for Change.** A Cover Sheet questionnaire was designed by the researchers to be completed by all participants on a weekly basis during the 6-week collection period of the study. The 2-item measure scores responses on an 11-point scale from 0 (“Not”) to 10 (“Very”). The first question asked the participant to indicate, “How important is decreasing your anxiety right now?” The second question asked participants “How confident are you that you are ready to decrease your anxiety?” This measure can be found in Appendix S.
CHAPTER III

RESULTS

Preliminary Analyses

The means, standard deviations, and ranges for the continuous variables used in the current study are summarized in Table 1.

Table 1

Descriptive Statistics for Continuous Study Measures

<table>
<thead>
<tr>
<th>Variables</th>
<th>M (pre/post)</th>
<th>SD (pre/post)</th>
<th>Min-Max (pre/post)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSWQ</td>
<td>64.12 / 56.93</td>
<td>12.99 / 14.77</td>
<td>41-80 / 41-80</td>
</tr>
<tr>
<td>GAD</td>
<td>14.29 / 12.29</td>
<td>6.22 / 6.79</td>
<td>1-21 / 1-21</td>
</tr>
<tr>
<td>CESD</td>
<td>30.29 / 30.43</td>
<td>11.50 / 13.55</td>
<td>4-47 / 3-55</td>
</tr>
<tr>
<td>WAI-C</td>
<td>71.65 / 71.43</td>
<td>10.02 / 10.77</td>
<td>49-84 / 58-84</td>
</tr>
<tr>
<td>WAI-T</td>
<td>64.82 / 64.64</td>
<td>8.31 / 14.41</td>
<td>48-76 / 28-83</td>
</tr>
<tr>
<td>AYEQ</td>
<td>n/a / 16.33</td>
<td>n/a / 9.90</td>
<td>n/a / 5-31</td>
</tr>
<tr>
<td>ATEQ</td>
<td>n/a / 11.00</td>
<td>n/a / 7.07</td>
<td>n/a / 5-28</td>
</tr>
<tr>
<td>RFC</td>
<td>16.29 / 16.00</td>
<td>3.65 / 3.68</td>
<td>8-20 / 10-20</td>
</tr>
<tr>
<td>COM-D</td>
<td>7.69</td>
<td>11.86</td>
<td>0 - 40</td>
</tr>
<tr>
<td>COM-F</td>
<td>2.15</td>
<td>5.05</td>
<td>0 - 18</td>
</tr>
</tbody>
</table>

Note. PSWQ = anxiety 1 total score, GAD = anxiety 2 total score, CESD = depression total score, WAI-C = therapeutic alliance total score - client, WAI-T = therapeutic alliance total score - therapist, SCL = global functioning total score, AYEQ = client satisfaction/effectiveness, ATEQ = therapist report of client skill acquisition and treatment engagement, RFC = readiness for change total score, COM-D = compliance with daily report tasks, and COM-F = compliance with free entry tasks.
Preliminary analyses were conducted using a one-way Analysis of Variance (ANOVA) to determine if there were any significant group differences on the criterion variables prior to the intervention. There were no significant differences between groups on the pre-intervention measures of the PSWQ, GAD-7, CES-D, SCL-27, WAI-SR, or TMQ. Additional analyses were used to determine if there were any significant associations between demographic variables (i.e., age and time in treatment with therapist) and the criterion variables of anxiety and therapeutic alliance in order to identify possible confounding variables. Zero-order correlations were computed for this purpose. The results revealed no significant relationships between age and anxiety on the PSWQ, \( r = .06, p > .05 \), age and anxiety on the GAD-7, \( r = .12, p > .05 \), or age and therapeutic alliance from both the client perspective, \( r = -.52, p > .05 \), and the therapist perspective, \( r = .62, p > .05 \). Further, there were no significant relationships revealed between time in treatment and the criterion variables. Therefore, age and time in treatment with the therapist were not statistically controlled for in the primary analyses. Additional zero-order correlations for the criterion study variables are presented in Table 2. Both measures of anxiety (i.e., PSWQ and GAD-7) were strongly associated, \( r = .77, p < .01 \).
Table 2

**Zero-Order Correlations Among Continuous Study Variables**

<table>
<thead>
<tr>
<th></th>
<th>PSWQ</th>
<th>GAD</th>
<th>CESD</th>
<th>WAI-C</th>
<th>WAI-T</th>
<th>SCL</th>
<th>AYEQ</th>
<th>ATEQ</th>
<th>COM-D</th>
<th>COM-F</th>
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<tbody>
<tr>
<td>PSWQ</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GAD</td>
<td>.77**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CESD</td>
<td>.62**</td>
<td>.89**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WAI-C</td>
<td>-.02</td>
<td>.36</td>
<td>-.17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WAI-T</td>
<td>-.15</td>
<td>-.30</td>
<td>-.27</td>
<td>.06</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCL</td>
<td>.59*</td>
<td>.56*</td>
<td>.70**</td>
<td>.13</td>
<td>-.43</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AYEQ</td>
<td>-.01</td>
<td>-.08</td>
<td>.15</td>
<td>-.46</td>
<td>-.12</td>
<td>-.26</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATEQ</td>
<td>.04</td>
<td>.16</td>
<td>.18</td>
<td>-.26</td>
<td>.03</td>
<td>-.08</td>
<td>.06</td>
<td></td>
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</tr>
<tr>
<td>COM-D</td>
<td>.45</td>
<td>.27</td>
<td>-.07</td>
<td>.32</td>
<td>.04</td>
<td>-.16</td>
<td>-.60</td>
<td>.15</td>
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<tr>
<td>COM-F</td>
<td>.46</td>
<td>.44</td>
<td>.05</td>
<td>.17</td>
<td>-.06</td>
<td>.01</td>
<td>-.38</td>
<td>.35</td>
<td>.80**</td>
<td></td>
</tr>
</tbody>
</table>

*Notes.* *p < .05. **p < .01. PSWQ = anxiety 1 total score, GAD = anxiety 2 total score, CESD = depression total score, WAI-C = therapeutic alliance total score - client, WAI-T = therapeutic alliance total score - therapist, SCL = global functioning total score, AYEQ = client satisfaction/effectiveness, ATEQ = therapist report of client skill acquisition and treatment engagement, RFC = readiness for change total score, COM-D = compliance to daily report tasks, and COM-F = compliance to free entry tasks.

**Primary Analyses - Inferential Statistics**

**Hypothesis 1.** The first hypothesis was that there would be fewer reported symptoms of anxiety between participants in the TAU+app condition in comparison to both alternative treatment conditions (TAU and TAU+paper), as measured by the PSWQ and GAD-7. Additionally, for the same comparison of treatment conditions, it was also
expected that clients would report a better working alliance with their therapist, as measured by the WAI-SR.

A repeated-measures ANOVA was computed to determine if there were any significant differences in pre-to-post changes among the treatment groups. The results indicated that there were no significant differences between the TAU+app condition and the TAU+paper condition for anxiety on the PSWQ, $F(1,6) = .46, p > .05$, anxiety on the GAD-7, $F(1,6) = .40, p > .05$, or therapeutic alliance from both the client perspective, $F(1,6) = 2.19, p > .05$, and the therapist perspective, $F(1,7) = .47, p > .05$. Therefore, the results failed to indicate that clients utilizing the smartphone application in addition to their TAU showed significant differences on measures of anxiety and therapeutic alliance when compared to clients using the paper log along with their TAU. Additionally, the results indicated that there were no significant differences between the TAU+app condition and the TAU condition for anxiety on the PSWQ, $F(1,8) = .66, p > .05$, anxiety on the GAD-7, $F(1,7) = .25, p > .05$, or therapeutic alliance from both the client perspective, $F(1,8) = .54, p > .05$, and the therapist perspective, $F(1,8) = 3.63, p > .05$. Therefore, the results provided no evidence of significant differences in pre-to-post changes in anxiety or strength of the therapeutic alliance between the TAU+app and TAU conditions. Finally, results showed that clients’ reported readiness for change (i.e., engagement in therapy) was not significantly different between the TAU+app condition and TAU+paper condition, $F(1,6) = 1.09, p > .05$, or between the TAU+app condition and the TAU condition, $F(1,8) = .10, p > .05$.

**Hypotheses 2.** The second hypothesis stated that in comparison to the TAU+paper condition specifically, clients in the TAU+app condition would show greater
rates of compliance with daily assessments, thus providing more data points for use in psychotherapy and greater usefulness of assessment procedures. Overall, the average compliance with daily assessments was 18% ($M = 7.69$, $SD = 11.86$), with the compliance rates ranging from 0% to 95%. T-tests were computed to determine if there were group differences in compliance, client satisfaction, and therapist reported client skill acquisition and treatment engagement. The results indicated that there were no significant differences between the TAU+app ($M = 2.33$ daily report; $M = 1.50$ free entry) and TAU+paper ($M = 15.80$ daily report; $M = 3.60$ free entry) condition in in compliance with daily reports, $t(9) = 1.80, p > .05$, or to free entry reports, $t(9) = .62, p > .05$. Further, the results indicated that there were no significant differences between the TAU+app ($M = 3.35$ client; $M = 2.36$ therapist) and TAU+paper ($M = 2.60$ client; $M = 2.05$) condition in regards to client satisfaction, $t(5) = -.52, p > .05$, or therapist ratings of client skill acquisition and treatment engagement, $t(7) = -.37, p > .05$. The group comparisons through the t-test failed to show any significant differences in the usefulness of the two different entry mediums (i.e., smartphone application and paper log).

**Hypothesis 3.** Finally, the third hypothesis expanded on hypothesis one stating that the lower rates of anxiety predicted for the TAU+app condition would be explained by various components, including: higher compliance rates on assessments, increased working alliance, as well as therapist report of clients’ skill acquisition and treatment engagement. These tests were not conducted owing to the lack of any association found between the proposed mediators (compliance rates, ratings of skills acquisition and engagement, therapeutic alliance) and levels of anxiety.
CHAPTER IV
DISCUSSION

The emergence of smartphone technology has begun to shift the view of traditional approaches to treatment, whether in a medical, pharmaceutical or psychological setting (Kratzke & Cox, 2012; Luxton, McCann, Bush, Mishkind & Reger 2011; Miller, 2012). Widespread availability of and familiarity with smartphones presents the opportunity to utilize mobile applications as tools to enhance psychotherapy. Previous studies have examined the completion of assessment items using mobile phone (i.e., text message) assessment and smartphone application software (Ainsworth et al., 2013). For example, Ainsworth and colleagues investigated the ability of participants to complete smartphone entries about symptoms (e.g., delusions, hallucinations, anxiety and depression) at various times throughout the day (Palmier-Claus et al., 2013), and Pramana and colleagues (2013) investigated therapists’ comfort and perceived usefulness of a smartphone application for intervening in child anxiety.

The current study sought to extend the previous literature by evaluating the effects of smartphone applications on variables related to therapeutic outcomes and processes. Specifically, this study examined the effects of a smartphone application on reducing anxiety levels in a sample of adults receiving treatment for GAD. This study also planned to test for mediation if effects were found for the smartphone application. It was hypothesized that a smartphone application could promote compliance with tracking o
anxiety and associated events. Further, it was hypothesized that collection of these entries could enhance therapeutic alliance and promote client skill development.

In the remainder of the discussion, I will review the findings in regard to each of the three hypotheses present in the current study, discussing possible implications. Further, I will discuss limitations of the current study and potential directions for future study.

Hypothesis 1: Effects of the Smartphone Application on Anxiety and Working Alliance

It was predicted that clients in the TAU+app condition would report fewer symptoms of anxiety and a better working alliance with their therapists over time when compared to both alternative treatment conditions (i.e., TAU and TAU+paper). Previous research suggested that participants in a clinical setting could remain compliant with smartphone application assessments (Ainsworth et al., 2013), and that integrating these responses into treatment could improve treatment outcomes by promoting skill acquisition and homework completion (Kazantzis, 2000; Kazantzis et al., 2000). To my knowledge, the current study was the first to investigate the integration of a smartphone application into treatment for anxiety with the hopes of measuring treatment outcomes.

The results failed to indicate that clients utilizing the smartphone application in addition to their TAU showed significant differences on measures of anxiety and therapeutic alliance when compared to clients using the paper log along with their usual treatment or only their usual treatment. Examination of the means revealed a decrease in anxiety from pretreatment to end treatment for all three conditions. The TAU+app group showed a smaller rate of change on the PSWQ when compared with the TAU+paper and
the TAU conditions, but these differences were not statistically significant. Similarly, for the means calculated for the GAD-7, all conditions showed a decrease in anxiety from pretreatment to end treatment. Again, the TAU+app condition showed a smaller rate of change in comparison of the means to those of the TAU+paper conditions, but these differences were not statistically significant.

The lack of positive effects from use of the application may be attributed to its infrequent use among participants. Examination of rates of daily report and free entries, as well as therapist written comments on the ATEQ at the conclusion of the study suggest that clients did not complete enough of the entries for the smartphone application to promote treatment outcomes. The greatest obstacle to detecting effects of the intervention was the very limited statistical power of the analyses owing to the very small number of participants recruited for the study (n = 19). I will describe obstacles to a larger samples size when discussing the limitations of the current study.

**Hypothesis 2: Compliance with Smartphone Application Entries in Comparison to Other Treatment Conditions**

Participants in the TAU+app condition were predicted to show greater rates of compliance with daily assessments and greater perceived satisfaction and effectiveness of assessment procedures compared to the TAU+paper condition. With homework compliance having been identified as important for therapeutic skill development (Kazantzis et al., 2005), it is vital to understand the client’s level of engagement in and perceived effectiveness of these tasks. Past studies have identified the following client factors to have an influence on compliance with homework: the perceived benefits of the assignment, the difficulty of assignment completion (e.g., time required, effort expended,
and complexity of the task), the degree to which the assignment builds on the skills the client already possesses or is learning, and the degree of support and encouragement the therapist provides (Conoley et al., 1994; Scheel et al., 1998). Further, Malouff and Schutte (2004) identified additional conditions that promote compliance with homework tasks, including the opportunity to complete the task assigned to them and the recollection that they are to complete the task.

The current study attempted to address these compliance-related factors in the development of a smartphone application. Prior to entry in the study, each therapist was instructed to discuss with their client the benefits of utilizing the interventions (i.e., smartphone application or paper packets depending on condition), and this encouragement was anticipated throughout the duration of the study. In addition, the difficulty of the task of completing entries was a focal point of the smartphone application development, as the application was designed to be completed quickly and easily. Further, the application was designed based on skills that the study’s therapists identified as aspects that were being targeted in therapy (i.e., discussing thoughts, labeling feelings and using coping strategies). In an effort make daily reports easy, fast, and related to therapy skills emphasized across different therapist modalities, the smartphone application was limited to collecting information regarding anxiety level ratings, descriptions of experiences, thoughts, feelings, and coping. Therefore, more advanced and modality-specific topics such as cognitive restructuring were omitted from this application. Finally, the built-in reminder feature was designed to assist with recollection of the daily entry task and therefore to promote compliance.
Despite tailoring the smartphone application to client needs and concerns, the average compliance with both daily report (18%) was lower than expected. The TAU+paper group showed higher rates of compliance ($M = 15.80$ daily report; $M = 3.60$ free entry) as compared to the TAU+app treatment group ($M = 2.33$ daily report; $M = 1.50$ free entry). The higher compliance rates for paper logs could have resulted from the familiarity with paper assessment tasks as homework. Despite the higher compliance with the paper logs, ratings of client satisfaction and therapist’s reports of client skill acquisition during the study were both higher for the TAU+app condition. Although few entries were completed by participants, this may be an initial indication that the smartphone medium was preferred by the client and was seen as more beneficial to client skill acquisition by therapists.

As reported above, statistical testing of group differences failed to show any significant differences in compliance between the smartphone application and paper log groups. The lack of significant differences may be explained by the very small sample size limiting statistical power. The smartphone not acting as the client’s primary telephone, inflexibility in the timing of the reminder alert (i.e., 8:00 pm), insufficient training from both client and therapist, and minimal reinforcement by therapists for clients’ completion of entries may explain the very low compliance rate.

**Hypothesis 3: Potential Mediating Factors to Improved Treatment Outcomes from Smartphone Application Integration**

The lower rates of anxiety that were hypothesized for the TAU+app condition were predicted to be explained by a number of factors, including: higher assessment compliance rates, increased working alliance, and therapists’ increased awareness of
client progress and difficulties, as these factors have been found to predict improved treatment outcomes (Bryant et al., 1999; Cox et al., 1988; Detweiler-Bedell & Whisman, 2005; Kazantzis, 2000; Kazantzis et al., 2000; Kazantzis et al., 2005; Lambert et al., 2003; Whipple et al., 2003). These proposed mediators were not found to be associated with levels of anxiety, precluding any mediation effects. It is possible that the small sample size, limited number of client entries completed, and therapist training and comfort with the application, all limited the potential effects of the smartphone application on the proposed mediators. If clients do not consistently complete daily entries, clients and their therapist will be unable to review anxiety levels during the week, discuss moment of high or low anxious moments, or discuss factors may have contributed to or alleviated anxiety. Furthermore, without consistent completion of daily reports or free entries, significant changes in working alliance or therapist awareness of client progress would not be anticipated.

Limitations of the Current Study

The current study was limited by a number of factors. First, because of the small number of participants that were recruited (n = 19) and smaller number of participants completing the study (n = 13), the statistical power of the analyses were very low. Difficulties in recruitment occurred due to the exclusionary criteria and limitation to the specific diagnosis of GAD. Challenges also occurred due to lack of client participation in their therapy in a more general fashion (e.g., missing numerous sessions during the study period and weeks/months between sessions with their therapist). Limited attendance by the client in therapy may indicate less engagement overall in their treatment, which may decrease the likelihood that they would engage in additional out-of-treatment tasks.
Further, if clients were not compliant with the tasks requested, therapists had limited opportunities to reinforce the importance and encourage the completion of the tasks. Recruiting from a larger participant pool to ensure increased enrollment would be recommended for follow-up.

Additionally, despite receiving a student award funding a portion of the project, limitations in funding for the project limited the technology available to the researchers for the project (i.e., smartphones). The smartphone application was developed to specifically work on the Android platform on a specific model of phone. Because study participants owned phones that were different than the Android phone model the application was developed, it was not possible to install the application on their personal smartphones. Therefore, for all the study participants, the smartphones purchased by the researcher were used as a secondary phone, thereby reducing the convenience of completing entries via smartphone. These factors likely significantly reduced daily assessment compliance rates.

Another limitation of the study relates to therapists’ and clients’ comfort and training with the smartphones and the application. From the client perspective, as was mentioned above, this was a new device for each client participant. Clients received their phone on the day they completed their pretreatment packet. Additional time with the phone, or ideally the application being placed on their own smartphone, would optimize the effectiveness of the medium. In regards to training, both clients and therapists received brief instruction on how to complete entries and navigate the application. Therapists and clients were also welcomed to ask questions or express concerns regarding use of the smartphone or application. This training may have been insufficient for
therapist and clients to develop comfort with the smartphone and application. In a subsequent study, this period of instructional training would be longer in duration for both groups.

Client discomfort with the application may also have reduced motivation to complete entries and examine and discuss data from entries in session. When clients failed to complete entries over the initial weeks of the study, the therapist may not have reinforced the importance the task for their client’s treatment. Without early reinforcement for clients’ use of the smartphone application, it would likely suggest that the task is of limited importance.

Finally, the application itself could be altered to improve functionality and ease of use. For the purposes of standardization, and to reflect a consistent period of reflection for each participant, the reminder for daily entries was set at 8:00 pm each evening. While completing the entry in the evening is still preferred, the time could be modified to fit the schedule of individual clients and increase completion of daily entries. Advanced topics that were previously mentioned (e.g., cognitive restructuring) could be used for clients who are further along in therapy. The client and therapist may wish to extend the use of the application to assist with newly learned skills.

**Directions for Future Study**

Addressing some of the limitations of the current study would help obtain a better understanding of the influence a smartphone application could have in the treatment of anxiety. By addressing budgetary limitations, the smartphone technology can be advanced. Personal smartphones activated with extended contracts would likely ensure the client would use the phone as their primary device. Further, by clients purchasing the
smartphone themselves, they are likely to be more interested in the capability of the device, and have it on their person most of the time.

The application itself should be expanded to operate on both Android and iOS platforms to expand the availability of the application. It would also be important to ensure that the application is optimized for each version of phones (i.e., various screen sizes and software versions). Additionally, adding voice entry to the application as an alternative to typing could accelerate and simplify the completion of entries and encourage use for individuals who are not comfortable typing on touchscreens.

In future research, providing a tablet (Android or iOS) for each therapist would make sharing and utilizing information from the client’s smartphone in session easier. Having a personal tablet device for each therapist could increase the comfort level the therapist has with the technology. This could serve as a reminder to encourage the client to complete entries and for the therapist to use the information in session.

Altering the smartphone application to align more closely with specific skills being taught in therapy could show additional benefits. Additional personalization can occur by including questions based on concepts such as identifying and restructuring cognitive distortions, relaxation training, and reality testing. Widespread access to smartphones presents the opportunity for the personalized tailoring of innovative tools for advancing treatment. Creating a “hide” feature for advanced aspects of the application would allow for those features to only be presented to the client if they are currently working on them in therapy. This would allow for further tailoring of the treatment tool to each individual’s progress in therapy.
Finally, while smartphones technology has been shown to be useful for task completion with clients with anxiety and schizophrenia (Ainsworth et al., 2013; Palmier-Claus et al., 2012; Pramana et al., 2013), future studies could be designed to study treatment outcomes in other disorders (i.e., other anxiety disorders, depression, etc.). Extending this smartphone application to use for other disorders would require alterations to the content of the application, as it is currently designed around CBT content.

The current study developed and provided an initial evaluation of a smartphone application designed to enhance treatment for GAD. Further research should be conducted to evaluate the effects of the application with a larger sample size. Future research should also address limitations identified in the current implementation of the application. This might involve providing additional training to clients and therapists in using the application to complete entries and in using information from daily entries to enhance in-session interactions. The increasing availability, frequency of use, and capability of smartphones presents a unique opportunity to revolutionize the treatment tools and tasks used in traditional psychotherapy.
REFERENCES


APPENDIX A

Informed Consent to Participate in a Research Project (Therapist)

Project Title: Application for Generalized Anxiety

Investigator(s): Jeremy Schwob and Jackson Goodnight, PhD

Description of Study: This study investigates whether using a smartphone application to keep a daily record of anxious feelings, thoughts, and coping responses can enhance talk therapy as usual for clients receiving therapy for Generalized Anxiety Disorder. We are inviting therapists from South Community, Inc. who are currently treating clients for Generalized Anxiety Disorder to participate in this research. If you choose to participate, up to five of your clients with a current diagnosis of Generalized Anxiety Disorder will be asked to participate in the study. Client participants will be randomly assigned to one of three possible groups: (1) “Treatment as usual,” which involves continuing with treatment without any changes; (2) “Smartphone monitoring,” which involves continuing treatment with the addition of using a smartphone application that the client participant will use to record symptoms of anxiety, associated thoughts and feelings, and coping responses on a daily basis for six weeks so they can be discussed in session with your, their therapist; or (3) “Paper log monitoring,” which involves continuing treatment with the addition of using a paper log that the client will use to record symptoms of anxiety, associated thoughts and feelings, and coping responses on a daily basis for 6 weeks so they can be discussed in session with you, their therapist. Because we do not know if monitoring symptoms of anxiety using a smartphone application actually improves treatment, we need to compare it to treatment as usual and monitoring without using a smartphone, as described above. Assignment of the client participants to the three groups will be determined by chance, meaning that your clients who participate may be assigned to any of the three groups.

In your role as a therapist participant in this research, you will be asked to continue conducting your usual treatment. In addition, you will be asked to review and utilize the anxiety-related information collected between sessions by client participants who are assigned to either the “Paper log monitoring” or “Smartphone monitoring” groups. In addition, clients in the “Paper log monitoring” or “Treatment as usual” groups, will be provided an opportunity to trial the smartphone application as part of therapy for 6 weeks after the study concludes, though no data will be collected during this time.

In addition, at the beginning of the study, you will be asked to attend a meeting where you will learn about the smartphone application and the paper monitoring forms and how you may go about reviewing in session the anxiety-related information collected by your clients. Also, you will be asked to complete questionnaires about your therapeutic experience with your participating client at weeks 1, 6 and 10 of the study.

Adverse Effects and Risks: No adverse effects are anticipated as a result of completing study procedures. However, if you or the researchers believe that a client participant’s progress in therapy is in any way negatively affected by their participation, their participation in the study will be terminated and treatment will continue as it had before the study began. In addition, if at any point you wish to end your participation in the study for any reason, you may exercise your right to do so without penalty of any kind.
Duration of Study: Your participation in the study will last 10 weeks, plus an additional 6 weeks where your clients who were not assigned to the “smartphone application” group will have the option to use the smartphone application as part of therapy, but not as part of the study. Following the first 6 weeks of the study period, smartphones will be returned to the researchers and client participants will no longer keep daily reports of anxiety symptoms to share with you during sessions.

Confidentiality of Data: The information that we collect from this research project will be kept confidential. Information that will be collected from you as part of the study will be stored in a locked cabinet and no one but the researchers will be able to see it. Any questionnaire you complete will be identified with a number instead of your name. Only the researchers will know what your number is and we will lock that information up with a lock and key in a location separate from where questionnaires are stored. Your name will not be revealed in any document resulting from this study.

Contact Person: Participants may contact Jackson Goodnight, PhD, (937) 229-2738, Saint Joseph Hall 304, jackson.goodnight@udayton.edu. If you have questions about your rights as a research participant you may also contact the chair of the Research Review and Ethics Committee, Lee Dixon, PhD, (937) 229-2160, lee.dixon@udayton.edu.

Consent to Participate: I have voluntarily decided to participate in this study. The investigator named above has adequately answered any and all questions I have about this study, the procedures involved, and my participation. I understand that I may contact the researcher to answer any questions about research procedures at any point during the study period. I also understand that I may voluntarily terminate my participation in this study at any time without losing any of my rights as a therapist here. I also understand that if I choose not to participate my employment at this clinic will not be affected in any way. I also understand that the investigator named above may terminate my participation in this study if he or she feels this to be in my best interest. In addition, I certify that I am 18 (eighteen) years of age or older.

Signature of Participant Participant’s Name (printed) Date

Signature of Witness Date

The University of Dayton supports researchers' academic freedom to study topics of their choice. The topic and/or content of each study are those of the principal investigator(s) and do not necessarily represent the mission or positions of the University of Dayton.
APPENDIX B

Informed Consent to Participate in a Research Project (Client)

Project Title: Application for Generalized Anxiety

Investigator(s): Jeremy Schwob and Jackson Goodnight, PhD

Description of Study: This study investigates whether using a smartphone application to keep a daily record of anxious feelings, thoughts, and coping responses can improve talk therapy as usual for Generalized Anxiety Disorder. We invite you to participate in this research because you currently receive treatment for Generalized Anxiety Disorder at South Community, Inc. If you participate in this study we will randomly assign you to one of three possible groups: (1) “Treatment as usual,” which involves continuing your treatment without any changes; (2) “Smartphone monitoring,” which involves continuing treatment with the addition of a smartphone application to record signs of anxiety, thoughts and feelings, and coping responses on a daily basis for six weeks so they can be discussed in session with the therapist, or (3) “Paper log monitoring,” which involves continuing treatment with the addition of using a paper log to record symptoms of anxiety, associated thoughts and feelings, and coping responses on a daily basis for 6 weeks so they can be discussed in session with the therapist. We do not know if watching signs of anxiety using a smartphone application helps treatment. Therefore, we need to compare it to treatment as usual and watching without using a smartphone. To do this, we will put people taking part in this research into the three groups. The groups are selected by chance. Therefore, if you choose to participate you have an equal chance (33%) of assignment to any of the three groups.

Regardless of which group you are assigned to, you will receive a smartphone to use during the first 6 weeks of the study. In addition, you will complete questionnaires about your well-being (e.g., symptoms of anxiety and depression) at the beginning of the study. Then, we ask that you complete brief questionnaires about your anxiety and depression at the beginning of each therapy session over the next six weeks. After the six-week period, we ask you to complete another group of questionnaires. This will ask about your well-being and your thoughts about your therapy. Finally, four weeks later (at week 10), you will complete a final set of questionnaires about your well-being and your experiences in therapy.

Adverse Effects and Risks: No adverse effects are anticipated as a result of completing study procedures. However, if your therapist or the researchers believe that your progress in therapy or well-being is in any way negatively affected by your participation in the study, he or she will terminate your participation in the study. In that case, your treatment will continue as it had before you began the study. If at any point you wish to end your participation in the study, you may do so. Your treatment
at South Community, Inc. then will continue as it had before you began participating in this study.

**Duration of Study:**
The study will take 10 weeks to complete, including 6 weeks of daily reporting of anxiety symptoms for participants assigned to groups that will monitor symptoms. Following the first 6 weeks of the study, you will return your smartphone to the researchers. Participants will no longer provide daily reports of anxiety symptoms for the study.

**Confidentiality of Data:**
The information that we collect from this research project will be kept confidential. Information about you that will be collected during the research will be stored in a locked cabinet. No one but the researchers will see it. Any information about you will have a number on it instead of your name. Only the researchers will know your number. We will lock that information up with a lock and key in a location separate from where your information is stored. Your name will not be revealed in any document resulting from this study.

**Contact Person:**
Participants may contact Jackson Goodnight, PhD, (937) 229-2738, jackson.goodnight@udayton.edu with questions about the study. If you have questions about your rights as a research participant you may also contact the chair of the Research Review and Ethics Committee, Lee Dixon, PhD, (937) 229-2160, lee.dixon@udayton.edu.

**Consent to Participate:**
I volunteered to participate in this study. The researcher has answered any and all questions I have about this study, the procedures involved, and my participation. I understand that I may contact the researcher to answer any questions about research procedures at any point during the study period. I also understand that I may choose to terminate my participation in this study at any time without losing any of my rights as a patient here. I also understand that if I choose not to participate it will not affect my treatment at this clinic in any way. I also understand that the investigator named above or my therapist may terminate my participation in this study if he or she feels this to be in my best interest. In addition, I confirm that I am 18 (eighteen) years of age or older.

<table>
<thead>
<tr>
<th>Signature of Participant</th>
<th>Participant’s Name (printed)</th>
<th>Date</th>
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</table>

<table>
<thead>
<tr>
<th>Signature of Witness</th>
<th>Date</th>
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</table>

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APPENDIX C

Flow Chart Representing Different Tracks in the Daily Report Pathway

**Daily Report**

1. In the past 24 hours what was your anxiety level at the most severe moment?

   \[\downarrow\]

   **0-1 rating**

   2. Describe what kept your anxiety low.

   \[\downarrow\]

   3. What thoughts were you having at the time?

   What feelings were you having at the time?

   \[\downarrow\]

   4. What did you do to keep your anxiety low?

   -End-

   **2+ rating**

   2. Describe what made you feel anxious.

   \[\downarrow\]

   3. What thoughts were you having at the time?

   What feelings were you having at the time?

   \[\downarrow\]

   4. What did you try to do to reduce your anxiety?

   (Slider 0-7) How well did it work?

   -End-

   What would you do next time?

   -End-
APPENDIX D

Screenshot Progression of the Application’s Daily Report Pathway
Question 2: Describe what made you feel anxious.

I was late for work and my boss yelled at me.

Question 3: What thoughts were you having at the time? (Thoughts are things we say to ourselves)

I am bad at my job and I am probably going to get fired.

Question 4: What feelings were you having at the time?

- calm
- relaxed
- worried
- scared
- afraid
- sad

What did you try to do to reduce your anxiety?

- Relaxation/Distraction
  - watch television
  - sleep/nap
  - listen to music
  - meditate/pray

- Thinking Differently
  - write in journal about your day
  - talk to a friend

- Problem Solving
  - talk to someone that can help (therapist/case worker)
  - make a plan
  - create a 'to do' list

What was your level of anxiety after you tried dealing with it?

Not at all Extremely

What would you do next time?

- Relaxation/Distraction
  - watch television
  - sleep/nap
  - listen to music
  - meditate/pray

- Thinking Differently
  - write in journal about your day
  - talk to a friend

- Problem Solving
  - talk to someone that can help (therapist/case worker)
  - make a plan
  - create a 'to do' list

Are you sure you're ready to complete this entry?

[NO] [YES]
APPENDIX E

Flow Chart Representing Different Tracks in the Free Entry Pathway

Add Entry
1. How anxious are you right now?
   1  2  3  4  5  6  7
   ↓
0-1 rating
2. Describe what is keeping your anxiety low.
   ↓
3. What thoughts are you having right now?
   What feelings are you having right now?
   ↓
4. Here are some things you could do.
   -End-

2+ rating
2. Describe what is making you feel anxious.
   ↓
3. What thoughts are you having right now?
   What thoughts are you having right now?
   ↓
4. Here are some things you could do.
   -End-
APPENDIX F

Screenshot Progression of the Application’s Free Entry Pathway

Question 1: How anxious are you feeling right now?

Not at all  | Extremely

Question 2: Describe what is keeping your anxiety low.

I was able to make it through my day without worrying too much.

Question 3: What thoughts are you having?
(I can handle things without stressing myself out.)

Question 4: What feelings are you having?

- calm
- relaxed
- worried
- scared
- afraid
- sad

What are some things you have done?

- Relaxation/Distraction
  - watch television
  - sleep
  - listen to music
  - meditate/pray

- Thinking Differently
  - write in journal about your day
  - talk to a friend

- Problem Solving
  - talk to someone that can help (therapist/case worker)
  - make a plan
  - create a to-do list
APPENDIX G

Daily Report Paper Log

Daily Report (After 8 pm)

Date ________  Time ________

1. In the past 24 hours what was your anxiety level at the most severe moment?
   0  1  2  3  4  5  6  7
   Not at all  Extremely

   0-1 rating
   2. Describe what kept your anxiety low.

   2+ rating
   2. Describe what made you feel anxious.

   ↓
   3. What thoughts were you having at the time?

   ↓
   3. What thoughts were you having at the time?

   ↓
   4. What feelings were you having at the time?
   □ calm  □ relaxed  □ worried
   □ scared  □ afraid  □ sad
   □ excited  □ confused  □ angry
   □ overwhelmed
   □ (write in your own):

   ↓
   (continue to next page)
0-1 rating (continued)

5. What did you do to keep your anxiety low?

**Relaxation/Distraction**

☐ watch television  ☐ sleep/nap
☐ listen to music  ☐ meditate/pray

**Thinking Differently**

☐ write in journal about your day
☐ talk to a friend

**Problem Solving**

☐ talk to someone that can help (therapist/case worker)
☐ make a plan  ☐ create a “to do” list
☐ learn more about the problem
☐ (write in your own):

---

2+ rating (continued)

5. What did you try to do to reduce your anxiety?

**Relaxation/Distraction**

☐ watch television  ☐ sleep/nap
☐ listen to music  ☐ meditate/pray

**Thinking Differently**

☐ write in journal about your day
☐ talk to a friend

**Problem Solving**

☐ talk to someone that can help (therapist/case worker)
☐ make a plan  ☐ create a “to do” list
☐ learn more about the problem
☐ (write in your own):

---

What was your level of anxiety after you tried dealing with it?

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>Extremely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

(continue to next page)
APPENDIX H

Free Entry Paper Log

Free Entry
Date ________ Time ________

1. How anxious are you feeling right now?
   0 1 2 3 4 5 6 7
   Not at all                          Extremely
   0-1 rating                          2+ rating

2. Describe what is keeping your anxiety low.
2. Describe what is making you feel anxious.

3. What thoughts are you having?
3. What thoughts are you having?

4. What feelings are you having?
   □ calm    □ relaxed    □ worried
   □ scared  □ afraid     □ sad
   □ excited □ confused    □ angry
   □ overwhelmed
   □ (write in your own):
   □ calm    □ relaxed    □ worried
   □ scared  □ afraid     □ sad
   □ excited □ confused    □ angry
   □ overwhelmed
   □ (write in your own):

(continue to next page) (continue to next page)
0-1 rating (continued)

5. Here are some things you can do:
   Relaxation/Distraction
   □ watch television  □ sleep/nap
   □ listen to music  □ meditate/pray
   Thinking Differently
   □ write in journal about your day
   □ talk to a friend
   Problem Solving
   □ talk to someone that can help (therapist/case worker)
   □ make a plan  □ create a “to do” list
   □ learn more about the problem
   □ (write in your own):

-End-

2+ rating (continued)

5. Here are some things you can do:
   Relaxation/Distraction
   □ watch television  □ sleep/nap
   □ listen to music  □ meditate/pray
   Thinking Differently
   □ write in journal about your day
   □ talk to a friend
   Problem Solving
   □ talk to someone that can help (therapist/case worker)
   □ make a plan  □ create a “to do” list
   □ learn more about the problem
   □ (write in your own):

-End-
APPENDIX I

Screenshot of the Application’s View History Screen
APPENDIX J

Penn State Worry Questionnaire (PSWQ)

Instructions: Rate each of the following statements on a scale of 1 (“not at all typical of me”) to 5 (“very typical of me”). Please do not leave any items blank.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Not at all typical of me</th>
<th>Very typical of me</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. If I do not have enough time to do everything, I do not worry about it.</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>2. My worries overwhelm me.</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>3. I do not tend to worry about things.</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>4. Many situations make me worry.</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>5. I know I should not worry about things, but I just cannot help it.</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>6. When I am under pressure I worry a lot.</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>7. I am always worrying about something.</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>8. I find it easy to dismiss worrisome thoughts.</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>9. As soon as I finish one task, I start to worry about everything else I have to do.</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>10. I never worry about anything.</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>
11. When there is nothing more I can do about a concern, I do not worry about it anymore.

12. I have been a worrier all my life.

13. I notice that I have been worrying about things.

14. Once I start worrying, I cannot stop.

15. I worry all the time.

16. I worry about projects until they are all done.
APPENDIX K

Generalized Anxiety Disorder-7 (GAD-7)

Over the last 2 weeks, how often have you been bothered by the following problems?

<table>
<thead>
<tr>
<th>Problem</th>
<th>Not at all sure</th>
<th>Several days</th>
<th>Over half the days</th>
<th>Nearly every day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Feeling nervous, anxious, or on edge</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2. Not being able to stop or control worrying</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3. Worrying too much about different things</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4. Trouble relaxing</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5. Being so restless that it’s hard to sit still</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6. Becoming easily annoyed or irritable</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7. Feeling afraid as if something awful might happen</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
## APPENDIX L

Center for Epidemiological Studies Depression Scale (CES-D)

These questions ask how often you have had certain feelings or experiences during the last week.

<table>
<thead>
<tr>
<th></th>
<th>Less than 1 Day</th>
<th>1-2 Days</th>
<th>3-4 Days</th>
<th>5-7 Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Was bothered by things that usually don’t bother me.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2.</td>
<td>Did not feel like eating; my appetite was poor.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3.</td>
<td>Felt that I could not shake off the blues even with help from my family and friends.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4.</td>
<td>Felt that I was just as good as other people.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>5.</td>
<td>Had trouble keeping my mind on what I was doing.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>6.</td>
<td>Felt depressed.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>7.</td>
<td>Felt that everything I did was an effort.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>8.</td>
<td>Felt hopeful about the future.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>9.</td>
<td>Thought that my life has been a failure.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>10.</td>
<td>Felt fearful.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Had restless sleep.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Felt happy.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Talked less than usual.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Felt lonely.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Felt that people were unfriendly.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Enjoyed life.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Had crying spells.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Felt sad.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Felt that people dislike me.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Felt that I could not “get going.”</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX M

Symptom Checklist (SCL-27-plus)

On the following pages you find various symptoms listed, which sometimes occur. Please tick in every line, how often the symptom has occurred with you over the past week.

<table>
<thead>
<tr>
<th>Symptom</th>
<th>never</th>
<th>seldom</th>
<th>times</th>
<th>often</th>
<th>very often</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Headaches</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>2. Chest pains</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>3. Muscle cramps</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>4. Muscle pain/sore muscles</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>5. Fear of leaving the house alone</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>6. Feeling of fear when you’re away from home long</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>7. Becoming afraid in crowds</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>8. Dizziness</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>9. Fear to say something embarrassing</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>10. Feeling others do not like me</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>11. Pain in arms or legs</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>12. Nausea</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>13. Heart palpitations</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>14. Being afraid in public places</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>15. Heart pounding</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>16. Backaches</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>17. Stomach troubles</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>18. Feeling inhibited when dealing with others</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>19. Feeling insecurity when others look at me</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>20. Feeling of being unwanted</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
</tbody>
</table>

(continue on back)
How often did you experience the following symptoms in the past two weeks?

<table>
<thead>
<tr>
<th></th>
<th>never</th>
<th>seldom</th>
<th>sometimes</th>
<th>often</th>
<th>very often</th>
</tr>
</thead>
<tbody>
<tr>
<td>21. Melancholy</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>22. Feeling blank inside</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>23. Would rather be dead</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>24. Hopelessness</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>25. Loss of joy</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

Have you ever experienced the following symptoms in your entire life?

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>21b. Melancholy</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>22b. Feeling blank inside</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>23b. Would rather be dead</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>24b. Hopelessness</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>25b. Loss of joy</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

26. If you checked off “yes” more than once in the right-hand column: Have you experienced more than one period in your life in which these symptoms developed? No | Yes |

If yes, about ___ times

27. Have you had thoughts about suicide No | Yes |

••••
APPENDIX N

Therapist Modality Questionnaire (TMQ)

1. How long have you been in therapy with this client? ______________

2. Please explain what types of therapy you use with this client. (Check all that apply)
   - □ CBT
   - □ DBT
   - □ Relaxation Training
   - □ Cognitive Therapy
   - □ Family Therapy
   - □ Group Therapy

   Additional comments:

3. How often do you discuss negative thoughts with this client?
   1 2 3 4 5 6 7
   Never Always

4. How often do you discuss negative feelings with this client?
   1 2 3 4 5 6 7
   Never Always

5. How often do you discuss positive thoughts with this client?
   1 2 3 4 5 6 7
   Never Always

6. How often do you discuss positive feelings with this client?
   1 2 3 4 5 6 7
   Never Always

7. How often do you discuss challenging and/or replacing thoughts with this client?
   1 2 3 4 5 6 7
   Never Always

8. How often do you talk about coping with this client?
   1 2 3 4 5 6 7
   Never Always

9. How often do you use strengths-based techniques with this client?
   1 2 3 4 5 6 7
   Never Always

10. How often do you use an insight-oriented approach with this client?
    1 2 3 4 5 6 7
    Never Always

11. How often do you use mindfulness training with this client?
    1 2 3 4 5 6 7
    Never Always
12. How often do you discuss interpersonal issues (i.e., relationships with others) with this client?
   1  2  3  4  5  6  7
   Never Always

Additional Questions:

13. To what extent are you comfortable using a smartphone (beyond making phone calls)?
   1  2  3  4  5  6  7
   Not at all Extremely

14. To what extent do you enjoy using a smartphone (beyond making phone calls)?
   1  2  3  4  5  6  7
   Not at all Extremely
APPENDIX O

Working Alliance Inventory-Client (WAI-SR)

Measurement Point (Week): Pretreatment  End-Treatment  Follow-up

Instructions:
On the following page there are sentences that describe some of the different ways you might think or feel about your counselor.

As you read the sentences mentally insert the name of your counselor in place of ___________ in the text.

Below each statement there is a seven point scale:

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>Rarely</td>
<td>Occasionally</td>
<td>Sometimes</td>
<td>Often</td>
<td>Very Often</td>
<td>Always</td>
</tr>
</tbody>
</table>

If the statement describes the way you always feel (or think) circle the number 7; if it never applies to you, circle the number 1. Use the numbers in between to describe the variations between these extremes.

Work quickly, your first impressions are the ones we would like to see.

PLEASE DON’T FORGET TO RESPOND TO EVERY ITEM.

1. ___________ and I agree about the things I will need to do in counseling to help improve my situation.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>Rarely</td>
<td>Occasionally</td>
<td>Sometimes</td>
<td>Often</td>
<td>Very Often</td>
<td>Always</td>
</tr>
</tbody>
</table>

2. What I am doing in counseling gives me new ways of looking at my problem.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>Rarely</td>
<td>Occasionally</td>
<td>Sometimes</td>
<td>Often</td>
<td>Very Often</td>
<td>Always</td>
</tr>
</tbody>
</table>
3. I believe ____________ likes me.
   
   1 2 3 4 5 6 7
   Never Rarely Occasionally Sometimes Often Very Often Always

4. ____________ does not understand what I am trying to accomplish in counseling.
   
   1 2 3 4 5 6 7
   Never Rarely Occasionally Sometimes Often Very Often Always

5. I am confident in ____________’s ability to help me.
   
   1 2 3 4 5 6 7
   Never Rarely Occasionally Sometimes Often Very Often Always

6. ____________ and I are working towards mutually agreed upon goals.
   
   1 2 3 4 5 6 7
   Never Rarely Occasionally Sometimes Often Very Often Always

7. I feel that ____________ appreciates me.
   
   1 2 3 4 5 6 7
   Never Rarely Occasionally Sometimes Often Very Often Always

8. We agree on what is important for me to work on.
   
   1 2 3 4 5 6 7
   Never Rarely Occasionally Sometimes Often Very Often Always

9. ____________ and I trust one another.
   
   1 2 3 4 5 6 7
   Never Rarely Occasionally Sometimes Often Very Often Always

10. ____________ and I have different ideas on what my problems are.
    
    1 2 3 4 5 6 7
    Never Rarely Occasionally Sometimes Often Very Often Always

11. We have established a good understanding of the kind of changes that would be good for me.
    
    1 2 3 4 5 6 7
    Never Rarely Occasionally Sometimes Often Very Often Always

12. I believe the way we are working with my problem is correct.
    
    1 2 3 4 5 6 7
    Never Rarely Occasionally Sometimes Often Very Often Always
APPENDIX P

Working Alliance Inventory-Therapist (WAI-SR)

Measurement Point (Week): Pretreatment End-Treatment Follow-up

Instructions:
On the following page there are sentences that describe some of the different ways you might think or feel about your client.

As you read the sentences mentally insert the name of your client in place of ___________ in the text.

Below each statement there is a seven point scale:

1  2  3  4  5  6  7
Never Rarely Occasionally Sometimes Often Very Often Always

If the statement describes the way you always feel (or think) circle the number 7; if it never applies to you, circle the number 1. Use the numbers in between to describe the variations between these extremes.

Work quickly, your first impressions are the ones we would like to see.

PLEASE DON’T FORGET TO RESPOND TO EVERY ITEM.

1. ___________ and I agree about the steps to be taken to improve his situation.

2. My client and I both feel confident about the usefulness of our current activity in counseling.

74
3. I believe ____________ likes me.
   
   1 2 3 4 5 6 7
   Never  Rarely Occasionally Sometimes Often Very Often Always

4. I have doubts about what we are trying to accomplish in counseling.
   
   1 2 3 4 5 6 7
   Never  Rarely Occasionally Sometimes Often Very Often Always

5. I am confident in my ability to help ____________.
   
   1 2 3 4 5 6 7
   Never  Rarely Occasionally Sometimes Often Very Often Always

6. We are working towards mutually agreed upon goals.
   
   1 2 3 4 5 6 7
   Never  Rarely Occasionally Sometimes Often Very Often Always

7. I appreciate ____________ as a person.
   
   1 2 3 4 5 6 7
   Never  Rarely Occasionally Sometimes Often Very Often Always

8. We agree on what is important for ____________ to work on.
   
   1 2 3 4 5 6 7
   Never  Rarely Occasionally Sometimes Often Very Often Always

9. ____________ and I have built a mutual trust.
   
   1 2 3 4 5 6 7
   Never  Rarely Occasionally Sometimes Often Very Often Always

10. ____________ and I have different ideas on what the real problems are.
    
    1 2 3 4 5 6 7
    Never  Rarely Occasionally Sometimes Often Very Often Always

11. We have established a good understanding between us of the kind of changes that would be good for ____________.
    
    1 2 3 4 5 6 7
    Never  Rarely Occasionally Sometimes Often Very Often Always

12. ____________ believes the way we are working with the problem is correct.
    
    1 2 3 4 5 6 7
    Never  Rarely Occasionally Sometimes Often Very Often Always
APPENDIX Q

About Your Experience Questionnaire (AYEQ)

Please answer the following questions based on your perceptions during the data collection period.

A.
1. How engaged were you in reflecting on smartphone application/paper reports?

   1    2    3    4    5    6    7
   Never                Always

2. To what degree did the smartphone application/paper reports help you in therapy?

   1    2    3    4    5    6    7
   Not at all            Very much

3. To what degree did the smartphone application/paper reports help you learn new skills?

   1    2    3    4    5    6    7
   Not at all            Very much

4. To what degree did the smartphone application/paper reports help have a better view of therapy?

   1    2    3    4    5    6    7
   Not at all            Very much

B.
1. To what extent are you comfortable using a smartphone (beyond making phone calls)?

   1    2    3    4    5    6    7
   Not at all            Extremely

2. To what extent do you enjoy using a smartphone (beyond making phone calls)?

   1    2    3    4    5    6    7
   Not at all            Extremely
3. How satisfied were you with the influence of the smartphone application/paper reports in your treatment?

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Extremely</td>
</tr>
</tbody>
</table>

4. If you used a smartphone to track your anxiety, what aspects of the application would you change to make it better?
APPENDIX R

About Their Experience Questionnaire (ATEQ)

Please answer the following questions based on your perceptions during the data collection period.

A.
1. How engaged was the client in reflecting on smartphone application/paper reports?

   1  2  3  4  5  6  7
   Never  Always

2. To what degree did the smartphone application/paper reports assist the client’s success in therapy?

   1  2  3  4  5  6  7
   Not at all  Very much

3. To what degree did the smartphone application/paper reports assist the client’s skill acquisition?

   1  2  3  4  5  6  7
   Not at all  Very much

4. To what degree did the smartphone application/paper reports assist the client’s attitude toward treatment?

   1  2  3  4  5  6  7
   Not at all  Very much

B.
1. To what extent are you comfortable using a smartphone (beyond making phone calls)?

   1  2  3  4  5  6  7
   Not at all  Extremely

2. To what extent do you enjoy using a smartphone (beyond making phone calls)?

   1  2  3  4  5  6  7
   Not at all  Extremely
3. How satisfied were you with the influence of the smartphone application/paper reports in the client’s treatment?

1  2  3  4  5  6  7

Not at all  Extremely

4. If one or more of your clients used a smartphone to track their anxiety, what aspects of the application would you change to make it better?
APPENDIX S

Cover Sheet Displaying Client’s Rating of Readiness for Change

<table>
<thead>
<tr>
<th>Cover Sheet</th>
<th>Date</th>
<th>ID #</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Session Packet:</th>
<th>Pre-treatment</th>
<th>Intermediate</th>
<th>End-treatment</th>
<th>Follow-up</th>
</tr>
</thead>
</table>

How *important* is decreasing your anxiety right now?

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not</td>
<td>Somewhat</td>
<td>Very</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

How *confident* are you that you are ready to decreasing your anxiety?

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not</td>
<td>Somewhat</td>
<td>Very</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>