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The Use of Technology to Augment Clinical Care in Depression and Anxiety Disorders

An Evidence Map

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For more information on this publication, visit www.rand.org/t/RR2177

Published by the RAND Corporation, Santa Monica, Calif.

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Preface

Over the past two decades, the U.S. Department of Defense (DoD) has made significant investments into developing effective treatments for military-related psychological health conditions. Evidence maps and systematic reviews are key components in the knowledge translation process and function to translate existing research into evidence-based health care guidelines that promote optimal clinical care. Although a few government agencies, including the U.S. Department of Veterans Affairs and the Agency for Healthcare Research and Quality, have established evidence synthesis centers, there is no similar center within DoD that can synthesize research evidence on psychological health issues of interest. Funded by a three-year contract from the Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury (now part of the Psychological Health Center of Excellence), staff at the Southern California Evidence-based Practice Center, housed at the RAND Corporation, has been tasked with conducting research syntheses on psychological health interventions important to military populations. This report is an evidence map performed in the first year of this three-year project. The purpose of this evidence map is to provide an overview of evidence about the use of technology, including video capabilities, computers, telephones, smartphones, and others, to support clinical care in depression and anxiety disorders. This map summarizes published randomized controlled trials (RCTs), as well as anticipated evidence reported in registered but as yet unpublished RCTs. The review should be of interest to military health policymakers and practitioners who oversee or implement treatment for depression and anxiety disorders.

None of the authors has any conflict of interest to declare.

This research is sponsored by the Office of the Secretary of Defense and conducted within the Forces and Resources Policy Center of the RAND National Defense Research Institute, a federally funded research and development center sponsored by the Office of the Secretary of Defense, the Joint Staff, the Unified Combatant Commands, the Navy, the Marine Corps, the defense agencies, and the defense Intelligence Community.

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Summary

Depression and anxiety are highly prevalent clinical conditions. The use of telehealth and online interventions might increase the reach of clinical services for these disorders and support more comprehensive treatment. Types of technology that can be used to support clinical interventions include video capabilities, computers, telephones, smartphones, and others. Treatment can be provider-guided, self-guided, or a mixture of the two, with interventions ranging from merely providing feedback or reminders to engaging in a complete course of psychotherapy. The purpose is to provide an overview of the use of telemedicine and other technology to augment clinical care in any depression and anxiety disorders (major depressive disorder, dysthymia, premenstrual dysphoric disorder, other specified or unspecified depressive disorder, separation anxiety disorder, selective mutism, social anxiety, panic disorder, agoraphobia, generalized anxiety disorder, specific phobia, and other specified or unspecified anxiety disorders, as well as transdiagnostic depression, anxiety, or co-occurring disorders).

This map summarizes published randomized controlled trials (RCTs) and anticipated evidence reported in registered but as yet unpublished RCTs. In June 2017, we searched PubMed, PsycINFO, and the Web of Science from inception to June 2017 to identify published RCTs. We used CENTRAL and clinicaltrials.gov to identify ongoing research. Two reviewers used predetermined eligibility criteria to independently screen literature identified in literature searches. Studies evaluating any type of treatment-related technology to augment clinical care in depression and anxiety disorders were included. Treatment evaluating other disorders, such as post-traumatic stress disorder, were excluded. The evidence map is based on a protocol that is registered in PROSPERO (CRD42017069691) and was guided by eight key questions addressing the research volume, the types of evaluated technologies, the function of the technology, the level of ongoing provider involvement, the direction of treatment effects, treatment adherence and study dropouts, acceptability, and adverse events of the evaluated technologies. The findings are displayed in figures documenting type, function, level of provider involvement, reported effectiveness on symptom improvement, intervention adherence, completeness of follow-up, and acceptance of the technology. Study details, adverse events, and upcoming research were documented in comprehensive tables.

We identified 4,061 citations related to technology in the treatment of depression and anxiety disorders and screened 1,094 publications as full text. We identified a large evidence base, including 280 published RCTs using technology in clinical care. The existing research reports on the use of different technologies to augment care, predominantly computer, phone, and smartphone applications, as well as combinations of technologies. We found the greatest amount of research for psychotherapy by computer (99/280 RCTs).

The technology in the identified studies served different functions in care delivery, including

exposure therapy (exposing phobic patients to their feared situation—e.g., through computer-delivered images, virtual reality, watching a video of themselves giving a speech), autoreminders, peer support (support given among patients), self-therapy (patients complete a psychotherapy treatment program without provider guidance—either recommended by the provider or found on their own), provider support (support given by provider to one patient or a group of patients), provider feedback (as part of psychotherapy), provider therapy (the provider guides a patient through a psychotherapy treatment program or individualized psychotherapy), and multiple functions. Most common was the use of multiple functions within the technology type, such as patient self-directed psychotherapy with provider support. The type refers to the function category. Many studies could only be described as “multiple functions” within a technology type, such as patient self-directed psychotherapy in combination with provider support. Existing technology approaches are centered around self- or provider-directed treatments, and a large number of studies use a combination of different administration formats. Regardless of the technology or type of treatment, 91 percent of studies reported that the intervention had a positive outcome of symptom improvements compared with baseline.

Across treatments delivered by computer, phone, smartphone, and multiple technologies, the highest rates of participants completing the modules of the treatment and follow-up assessments were phone applications. Where reported in RCTs, patient retention varied widely, particularly in computer applications. Four percent of included RCTs reported complete follow-up assessments. Only 38 percent of included RCTs measured acceptability; however, these consistently reported that the majority of patients found the treatment to be acceptable. Forty-nine (18 percent) of the studies addressed adverse events; 49 percent of these specified that there were no adverse events, 24 percent reported on worsening of symptoms, 8 percent reported on suicidality. Other events were varied; technology-specific events included a report of a patient putting troubling posts in an online peer forum and participants leaving the study because of difficulty with the computer.

We identified 102 ongoing U.S. trials of technology to support anxiety and depression treatment. Of these, 41 percent evaluate Internet-based psychotherapies, 19 percent use smartphones, and 12 percent are examining implementation of technology in primary care or collaborative care. Several areas of future research were identified, including more research on smartphone applications.

This evidence map provides a broad overview of the existing research evaluating the use of communications technology in depression and anxiety care and documents upcoming research to evaluate the role of technology in supporting clinical care.

Acknowledgments

We would like to thank Bradley Belsher, Annette Totten, Thomas Concannon, Kristie Gore, Rebecca Morgan, and Nigel Bush for their helpful comments and Patty Smith for administrative support of this work. We also appreciate the contributions of Aditya Barua, Joyce Marks, Christopher Maerzluf, Sangita Baxi, Jeremy Miles, and Geoffrey Grimm in programming and developing the figures.

Abbreviations

CBT	cognitive behavioral therapy
ID	identification
NR	not recorded
RCT	randomized controlled trial
SAMHSA	Substance Abuse and Mental Health Services Administration
TAU	treatment as usual

1. Introduction

Depression and anxiety are highly prevalent conditions (Substance Abuse and Mental Health Services Administration [SAMSHA], 2015; Kessler et al., 2005). Not only can it be emotionally challenging to be affected by these conditions, but the symptoms can lead to lost productivity, interpersonal difficulties, and disability. A recent study using a representative sample of the adult population in the United States estimated that lifetime prevalence of generalized anxiety disorder, major depressive disorder, and co-occurring anxiety and depressive disorder were 2.16, 11.25, and 1.98 percent (Blanco et al., 2014), respectively. Given the toll these illnesses can take on patients, families, and societies, providing adequate clinical care is critical.

In a nationally representative sample of the adult civilian U.S. population, 61 percent of respondents with lifetime major depressive disorder reported having sought treatment for depression (Olfson et al., 2012). Of those patients with an anxiety disorder, only 34 percent received what U.S. clinical experts would consider minimally adequate treatment (SAMSHA, 2008; Wang et al., 2005). Traditionally, depression and anxiety treatment has been delivered via face-to-face psychosocial interventions. However, cited barriers to this type of intervention include geographical factors, cost of the interventions, cost of transportation, and stigma related to receiving therapy (Corrigan, 2004). Recent advances in telephone, smartphone, and computer communication have made it possible to circumvent some of these obstacles by providing care across geographic distance and time enabling remote, private, and convenient care.

Technology used to augment care can be any use of technology to expand access or exchange information between provider and patient and encompasses care delivery in alternate treatment formats or in addition to face-to-face traditional treatment. The Health Resources and Services Administration defines *telehealth* as “the use of telecommunications and information technologies to share information, and provide clinical care, education, public health, and administrative services at a distance” (Health Resources and Services Administration, 2015). Telemedicine is using technology to improve a patient’s health by permitting two-way, real-time interactive communication between the patient and the physician or other health care provider. Many different types of technology can be used to support clinical interventions, including video capabilities, computers, telephones, smartphones, and others. The types of treatment can be provider-guided, self-guided, or a mix of the two. The interventions can range from merely providing feedback or reminders to engaging in a complete course of psychotherapy. There are many online interventions available, including social support forums, psychoeducation, and self-help materials (Van’t Hof, Cuijpers, and Stein, 2009). In addition, psychotherapy can be delivered online. For instance, cognitive behavioral therapy, which seeks to resolve problems by changing maladaptive thinking and behavior (Beck, 2011), can be delivered entirely online or guided in person by a therapist using online materials. A systematic review of online-supported

cognitive behavioral therapy found that it is both accepted by patients and effective for treating anxiety and depression (Andrews et al., 2010). A recent evidence map by the Agency for Healthcare Research and Quality that looked at systematic reviews of patient outcomes from telehealth for a range of medical conditions found that there is sufficient evidence to support the effectiveness of telehealth for psychotherapy as part of behavioral health (Totten et al., 2016).

One documented concern with online treatments is treatment attrition. A recent systematic review reported that if online interventions included either in-person or online therapist or administrative support, there were better outcomes and greater treatment retention (Richards and Richardson, 2012). Another systematic review found that study participants with anxiety and depression experience beneficial outcomes from both partial and full completion of online intervention modules (Donkin et al., 2011). Many patients own and use smartphones, and there are many behavioral health applications that patients could access on their individual device to assist in treatment of anxiety and depression (Torous, Friedman, and Keshavan, 2014). However, there is growing concern with both the quality and safety of these applications (Torous, Keshavan, and Gutheil, 2014).

The known range and uses of the technologies require the assessments to cover an expansive body of literature. The breadth of this topic suggests an evidence map is an effective way to summarize the existing research. Evidence maps synthesize large areas of research in an accessible and user-friendly manner. Through the use of visual displays of the volume and content areas of research, evidence maps can help to organize and understand the information (Miake-Lye et al., 2016). Evidence maps can also help to identify critical gaps in research. The purpose of this evidence map is to provide an overview of the broad research field of the use of technology in clinical care in depression and anxiety disorders to assist practitioners, policymakers, and researchers seeking to incorporate technology into their clinical care or identifying research gaps in augmenting care for depression and anxiety disorders.

This evidence map provides a visual overview of the distribution of evidence for the different types of technology for which there are randomized controlled trials (RCTs) examining their use in the treatment of depression and anxiety disorders. The evidence map concentrates on evaluations using this robust study design that allows drawing strong conclusions about the effectiveness of the technology. Furthermore, the evidence map focuses on treatment-related technology that has the potential to augment clinical depression and anxiety care. Although such technological treatment as biofeedback, transcranial magnetic stimulation, or electroconvulsive therapy may be used in these disorders, this evidence map is limited to telehealth and online interventions. The map documents both what is known and where there is little or no evidence yet and describes the volume, nature, and characteristics of research in this field. The evidence map also documents ongoing research that will become available in the near future.

Key Questions

The following areas are addressed in this evidence map:

1. What is the research volume evaluating the use of technology to augment depression and anxiety care?
2. What are the types of evaluated technologies?
3. What are the functions of the evaluated technologies?
4. What is the level of ongoing provider involvement in the evaluated technology?
5. What is the direction of effect in studies evaluating the technology?
6. What is the extent of treatment adherence and reported study dropouts?
7. What is the acceptability of the technology to patients and providers?
8. What are the types of potential adverse effects of the technology?

2. Methods

The evidence map is based on a protocol that is registered in PROSPERO (registration number CRD42017069691), an international prospective registry for systematic reviews. The evidence map also complies with criteria set for broad overviews, such as umbrella reviews (Aromataris et al., 2015).

Sources

We searched the electronic databases PubMed, PsycINFO, and the Web of Science to identify published English-language RCTs. RCTs can allow readers to draw strong evidence statements, a critical aspect for clinical practice guideline decisions. The search strategy is shown in the appendix. We reference-mined published reviews by screening studies included in pertinent reviews on the topic. In addition, we consulted with topic experts reviewing the draft report of this evidence map to check the sample for completeness.

We identified ongoing research through the trial registries CENTRAL and clinicaltrials.gov.

Search Strategy

The search strategy was developed by an evidence-based practice center librarian who worked with a psychiatrist familiar with the clinical conditions and treatments approaches and was informed by search results of the prior feasibility scans conducted for this project and existing reviews on telehealth. The search strategy is documented in the appendix.

We retrieved and screened full texts of RCTs evaluating the use of technology in the clinical care of depression and anxiety disorders to determine whether the publication met the inclusion criteria. The results of the literature search and screening are documented in a PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) literature flow diagram (see Figure A.1 in the appendix).

Inclusion Screening

Two reviewers (the project lead, who is an experienced reviewer and psychiatrist, and a RAND research associate with extensive literature-review experience) independently screened titles and abstracts of retrieved citations. Citations judged as potentially eligible by one or both reviewers were obtained as full text. Citations clearly not addressing technology to support depression and anxiety care, clearly describing other study designs, or clearly not reporting on empirical evidence from primary research studies were not further reviewed.

Following a pilot session to ensure similar interpretation of the inclusion and exclusion

criteria, the two literature reviewers independently screened full-text publications against the inclusion and exclusion criteria. Any disagreements were resolved through discussion by the review team. Reasons for exclusion were recorded in an electronic database.

The flow diagram is shown in Figure A.1 in the appendix.

Eligibility Criteria

Study inclusion and exclusion criteria can be summarized in the following “PICOTSS” framework (participants, interventions, comparators, outcomes, timing, settings, and study design).

- Participants
 - Included: Studies of male and female participants, 18 years of age or older, were eligible for inclusion. Participants could have any type of depression or anxiety symptoms, diagnosis, or disorders, including major depressive disorder, dysthymia, premenstrual dysphoric disorder, other specified or unspecified depressive disorder, separation anxiety disorder, selective mutism, social anxiety, panic disorder, agoraphobia, generalized anxiety disorder, specific phobia, and other specified or unspecified anxiety disorders. Studies including participants with transdiagnostic depression, anxiety, or co-occurring disorders were eligible for inclusion.
 - Excluded: Participants with depression or anxiety because of a substance/medication or medical condition were excluded. Participants with other diagnoses, such as obsessive-compulsive disorder or post-traumatic stress disorder, which are not classified as depression or anxiety disorders according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), were excluded. Studies exclusively reporting on participants with self-limited, situational depression or anxiety (i.e., preoperative anxiety) were excluded. Studies that did not consist of a majority of patients with depression or anxiety disorders were excluded. Studies that involved a population of patients with a particular medical diagnosis or situation (such as caregivers), in which the intervention addressed primarily the medical or situational needs and secondarily depression or anxiety symptoms, were excluded.
- Interventions
 - Studies evaluating technology to directly treat depression and anxiety or augment clinical care in depression and anxiety disorders were eligible. Interventions focused on consultation and collaboration among providers, such as between a primary care provider and a psychiatrist, were excluded. Interventions designed to treat or manage another condition, where the effects of the intervention on depression and anxiety were secondary, were excluded. We included phone, smartphone, video, or computer-based technology in clinical care, but technological treatment—such as biofeedback, transcranial magnetic stimulation, or electroconvulsive therapy offered in a health care setting—was excluded. The interventions could augment nonpharmacologic or medication-based care.
- Comparators
 - Studies that compare depression and anxiety disorder treatment without the use of technology, wait-list control, no-treatment, or other technology, were eligible.

- Outcomes
 - Studies reporting symptom improvement, response to treatment, and remission of depression and anxiety, as well as acceptance of the technology, treatment adherence, and adverse events associated with the technology were eligible. Studies reporting on recruitment practices, depression, and/or anxiety prevention or recognition were excluded.
- Timing
 - Studies could involve any treatment duration and any follow-up period.
- Setting:
 - Studies were not limited by setting, allowing for studies from any country and both military and nonmilitary settings.
- Study design
 - Studies that did not randomize to intervention versus comparator were excluded. Studies using any form of randomization (e.g., parallel, cross-over) were acceptable and included.

Only studies published in English were eligible for inclusion in this evidence map.

Data Extraction

An evidence map aims to provide a broad overview of a large literature base. To ensure the overview is meaningful, the number of variables that can be abstracted and displayed in result figures have to be selected carefully. Data-collection forms were designed by the project team in advance of literature screening. Reviewers pilot tested the data-collection forms on ten randomly selected studies to ensure agreement of interpretation. The reviewers abstracted study-level data using database software designed for systematic reviews. Unclear descriptions and ambiguities were discussed by the review team.

A listing of data abstraction variables follows:

- Identification (ID)
 - Study ID, publication year, additional publications reporting on the RCT
- Study size
 - Number of randomized participants (if this was not available, the number of participants analyzed) and number of participants in the technology intervention group
- Setting
 - Civilian, military, unclear
- Feasibility
 - Assessing whether the authors commented that the proposed intervention was a pilot
 - Tested in the target audience showing feasibility, acceptance, and proof of concept
 - Other reference to something establishing that it is acceptable
 - Assessing accuracy: yes, no, or unclear

- Psychiatric diagnosis
 - Diagnostic categories: depression, anxiety, depression, and anxiety, transdiagnostic, or unclear/not specified
- Type of technology
 - Categories of the type of technology used in supporting clinical care, according to the type of technology most likely chosen by the participant, based on the lowest level of technology most likely to fully implement the intervention: phone only, computer only (online treatment, email communication with providers), smartphone only (mobile computing with app and/or texting capability such as smartphones, and tablets), videoconferencing (simultaneous audio and video interaction with provider, requires camera and audio capabilities), multiple technology (explicitly using more than one technology, not for studies in which patients have the choice between using a normal phone or a smartphone), or other (including VCR or DVD player for prerecorded videos)
- Function of technology
 - Categories of the function of the technology in clinical care: automated reminders (fully automated), provider-sent reminders (requires interaction with provider, provider-initiated), patients' self-directed support (online resources for patients, peer support), provider support (e.g., provider-run support group), self-directed psychotherapy (e.g., online modules), provider-directed psychotherapy (virtual interaction with provider, e.g., interaction by phone or online), automated feedback (e.g., after task completion; patient has instructions to record task and to watch it back with specific instruction), provider feedback (e.g., provider watches recorded video from patient and gives feedback), exposure (e.g., to treat phobias), symptom tracking, data collection, multiple functions
- Mode of administration
 - Categories: provider, patient, automated, or other
- Adjunct treatment
 - Categorical flag identifying whether the technology is used in addition to conventional medication and/or psychotherapy, as opposed to being used as a standalone treatment (yes, no, unclear)
- Comparators
 - Categories of the type of comparator: no treatment, wait-list, treatment as usual (TAU) without the use of technology, other active treatments, or other
- Effectiveness signal
 - Category of directionality of effectiveness measure (i.e., whether the symptoms of depression or anxiety are improved relative to no augmentation through technology): negative (i.e., intervention group outcomes are worse than the control group or baseline outcomes), unclear (effect unclear, no change, or not applicable because two active technologies were compared), positive (i.e., intervention group outcomes are better than control group or baseline outcomes). Category based on results as reported by the original study authors and will be based on the outcomes most relevant to the diagnosis in the respective study (e.g., anxiety symptoms in patients treated for anxiety), compared with no augmentation through technology

- Acceptability of the technology
 - Any type of statement that refers to patient acceptability: not well accepted (study reports on acceptability, but acceptability rate is only 50 percent or less), not reported or unclear, well accepted (study reports acceptability rate of more than 50 percent)
- Treatment adherence
 - Percentage of patients completing all modules (or not reported), percentage of patients remaining in the study through final follow-up assessment (or not reported)
- Potential adverse effects
 - Adverse events related to the mode of administration (e.g., privacy breach, lost communication, diagnostic mistake, misunderstandings, boundary violations, worsening symptoms, other).

In addition to the completed RCTs, we also documented ongoing research registered with clinicaltrials.gov. We extracted the trial registration number, the year, and the affiliation, as well as the title of the ongoing RCT.

Critical Appraisal

Given the large number of RCTs, the assessment of individual studies concentrated on two central domains: whether the identified study reported on treatment adherence and documented the achieved adherence. In addition, we assessed whether each individual study reported on study dropouts, and we assessed the risk of incomplete outcome data reporting in the study.

Quality of Evidence

The evidence map quantifies the number of RCTs available for the research areas of interest and documents technologies in depression and anxiety care that have been evaluated using the strong study design of an RCT. RCTs allow confident evidence statements, and available research will be of particular interest to policymakers. The evidence map further broadly characterizes the quality of evidence across studies using three aspects of the GRADE (Grading of Recommendations Assessment, Development, and Evaluation) approach (Balshem et al., 2011): study limitations (risk of bias), imprecision, and inconsistency.

We assessed study limitations across identified studies by summarizing the dimensions outlined in the critical appraisal section and that we identified as important for the research area (treatment adherence and incomplete outcome data reporting due to treatment dropouts).

Furthermore, the evidence map figures display the size of the study—that is, the number of participants. The size of the study is instrumental to determine the interventions for which precise estimates are currently available in the literature. This aspect evaluates the potential for precise estimates across studies.

The evidence summary also highlights intervention evaluations and findings that have been replicated in multiple RCTs published by independent research groups.

Data-Sharing Plan

The evidence map is based on publicly available research (either open access or fee based, but accessible to the public). Upon completion of the project, we will add an HTML file displaying the included studies with links to the PubMed entries. PubMed is a free research database maintained by the National Library of Medicine. In addition, where available, we list the PMID number—a unique identifier assigned by PubMed—of each included publication in the references section. Throughout the report, data are linked to the publications that the data are based on. Using the identifier gives instant access to all openly available publications.

3. Results

The search and selection of published and ongoing RCTs are summarized in the literature flow diagram in Figure A.1. in the appendix.

Database searches of published literature and reference mining of included RCTs resulted in 4,061 potentially relevant articles. After dual review of titles and abstracts to determine if the citation could meet eligibility criteria, 1,365 RCTs were selected for full-text dual review. Of these, 280 RCTs met the inclusion criteria and are included in the evidence map: Adler et al., 2015; Alavi et al., 2016; Alegria et al., 2014; Allen et al., 2016; Andersson et al., 2005; Andersson, Carlbring, and Furmark, 2012; Andersson et al., 2006; Andersson, Hesser, et al., 2013; Andersson et al., 2012; Andersson et al., 2009; Andersson, Waara, et al., 2013; Andrews, Davies, and Titov, 2011; Areal et al., 2016; Au, 2015; Bae and Panuncio, 2008; Baikie, Geerligs, and Wilhelm, 2012; Beard and Amir, 2008; Bee et al., 2010; Beevers et al., 2017; Berger, Boettcher, and Caspar, 2014; Berger, Caspar, et al., 2011; Berger, Hämmerli, et al., 2011; Berger, Hohl, and Caspar, 2009; Berger et al., 2016; Bergström et al., 2010; Birney et al., 2016; Blackwell et al., 2015; Boeschoten et al., 2016; Boettcher, Aström, et al., 2014; Boettcher, Berger, and Renneberg, 2012; Boettcher, Hasselrot, et al., 2014; Boettcher et al., 2013; Bombardier et al., 2013; Bornas, Tortella-Feliu, and Llabrés, 2006; Botella et al., 2010; Botella et al., 2016; Bouchard et al., 2004; Brabyn et al., 2016; Brenes et al., 2015; Buntrock et al., 2015; Burton et al., 2016; Calkins et al., 2015; Carlbring et al., 2012; Carlbring et al., 2006; Carlbring, Ekselius, and Andersson, 2003; Carlbring et al., 2007; Carlbring et al., 2013; Carlbring et al., 2011; Carlbring et al., 2005; Carlbring et al., 2001; Carleton et al., 2016; Choi et al., 2012; Choi, Hegel, et al., 2014; Choi, Marti, et al., 2014; Chong and Moreno, 2012; Christensen, Griffiths, and Jorm, 2004; Christensen et al., 2006; Clarke et al., 2005; Clarke et al., 2009; Clarke et al., 2002; Dagöo et al., 2014; Dahlin et al., 2016; Day, McGrath, and Wojtowicz, 2013; de Graaf et al., 2011; Dean, Potts, and Barker, 2016; Dear et al., 2015; Dennis, 2003; Donker et al., 2013; Donkin et al., 2013; Dwight-Johnson et al., 2011; Ebert et al., 2014; Egede et al., 2015; Eisdorfer et al., 2003; Enock, Hofmann, and McNally, 2014; Farrer et al., 2011; Fischer et al., 2015; Fledderus et al., 2012; Fogliati et al., 2016; Fortney et al., 2007; Fortney et al., 2013; Fritsch et al., 2007; Furmark et al., 2009; Furukawa et al., 2012; Gallego et al., 2011; Geraedts, Kleiboer, Twisk, et al., 2014; Geraedts, Kleiboer, Wiezer, et al., 2014; Gilbody et al., 2015; Glozier et al., 2013; Glueckauf et al., 2012; Gorini et al., 2010; Griffiths et al., 2012; Grime, 2004; Hallgren et al., 2016; Hazen, Vasey, and Schmidt, 2009; Hedman, Andersson, Andersson, et al., 2011; Hedman, Andersson, Ljótsson, et al., 2011; Hedman et al., 2016; Hedman, Axelsson, et al., 2014; Hedman, El Alaoui, et al., 2014; Hickie et al., 2010; Hilty et al., 2007a; Hilty et al., 2007b; Himelhoch et al., 2013; Høifødt et al., 2013; Hungerbuehler et al., 2016; Hunkeler et al., 2012; Hunkeler et al., 2000; Ivanova et al., 2016; Johansson, Björkland, et al., 2013; Johansson,

Ekbladh, et al., 2012; Johansson, Lyssarides, et al., 2013; Johansson, Sjöberg, et al., 2012; Johnston et al., 2011; Jonas, Leuschner, and Tossmann, 2016; Jonassaint et al., 2017; Jones, Hadjistavropoulos, and Soucy, 2016; Kafali et al., 2014; Kahn, Collinge, and Soltysik, 2016; Kanai et al., 2011; Katzelnick et al., 2000; Kelders et al., 2015; Kenter et al., 2016; Kersting et al., 2011; Kessler et al., 2009; Kim et al., 2011; Kiropoulos et al., 2008; Kivi et al., 2014; Kleiboer et al., 2015; Klein et al., 2009; Klein and Richards, 2001; Klein, Richards, and Austin, 2006; Klein et al., 2016; Kok et al., 2015; Kok et al., 2014; Kolovos et al., 2016; Kraaij et al., 2010; LaFreniere and Newman, 2016; Lamers et al., 2015; Lappalainen et al., 2014; Lappalainen et al., 2013; Lappalainen et al., 2015; Lee et al., 2015; Lerner et al., 2015; Levin et al., 2016; Littlewood et al., 2015; Lokman et al., 2017; Lorian, Titov, and Grisham, 2012; Ludman et al., 2007; Luxton et al., 2016; Ly et al., 2015; Ly et al., 2014; Lynch et al., 2004; Mackinnon, Griffiths, and Christensen, 2008; Mahoney, Tarlow, and Jones, 2003; Mall et al., 2011; Maples-Keller et al., 2017; Marasinghe et al., 2012; Marks et al., 2004; Mathiasen et al., 2016; Matthews, Naran, and Kirkby, 2015; Mavandadi et al., 2015; Melnyk et al., 2015; Meyer et al., 2009; Meyer et al., 2015; Migliorini et al., 2016; Milani et al., 2015; Milgrom et al., 2016; Millán-Calenti et al., 2015; Mohr et al., 2011; Mohr et al., 2013; Mohr et al., 2005; Mohr et al., 2012; Montero-Marin et al., 2016; Moreno et al., 2012; Morgan, Jorm, and Mackinnon, 2012; Moritz et al., 2012; Morris, Schueller, and Picard, 2015; Mota Pereira, 2014; Müller et al., 2011; Mullin et al., 2015; Neubauer et al., 2013; Neugebauer et al., 2006; Newby et al., 2017; Newby et al., 2013; Ngai et al., 2015; Nilsson and Lundh, 2016; Nobis et al., 2015; Nordgren et al., 2014; Nowakowski, Antony, and Koerner, 2015; Nyström et al., 2017; O'Leary and Dockray, 2015; O'Mahen et al., 2013; O'Neil et al., 2014; O'Neil et al., 2015; Orbach, Lindsay, and Grey, 2007; Oromendia et al., 2016; Orr and Moscovitch, 2010; Pallavicini et al., 2009; Paxling et al., 2011; Perini, Titov, and Andrews, 2009; Pham et al., 2016; Phillips et al., 2014; Pictet, Jermann, and Ceschi, 2016; Piette et al., 2011; Pinto et al., 2016; Pinto et al., 2013; Pots et al., 2016; Proudfoot et al., 2013; Proudfoot et al., 2003; Proudfoot et al., 2004; Proyer et al., 2014; Pugh, Hadjistavropoulos, and Dirkse, 2016; Pyne et al., 2010; Richards, Timulak, and Hevey, 2013; Richards et al., 2015; Richards et al., 2016; Rickhi et al., 2015; Rickles et al., 2005; Robinson et al., 2010; Roepke et al., 2015; Rollman et al., 2009; Romero-Sanchiz et al., 2017; Rosmarin et al., 2010; Rosso et al., 2017; Ruskin et al., 2004; Ruwaard et al., 2010; Ruwaard et al., 2009; Salisbury et al., 2016; Sandoval et al., 2016; Schneider et al., 2005; Schröder, Jelinek, and Moritz, 2017; Schulz et al., 2016; Selmi et al., 1991; Sethi, 2013; Sheeber et al., 2012; Silfvernagel et al., 2012; Simon, Ludman, and Operskalski, 2006; Simon et al., 2004; Simon et al., 2011; Spek et al., 2007; Steffen and Gant, 2015; Stein et al., 2007; Stetz et al., 2011; Stiles-Shields et al., 2014; Ström et al., 2013; Stubbings et al., 2013; Taleban et al., 2016; Tillfors et al., 2008; Titov, Andrews, Choi, et al., 2008; Titov, Andrews, Davies, et al., 2010; Titov, Andrews, Johnston, et al., 2010; Titov et al., 2009; Titov, Andrews, and Schwencke, 2008; Titov, Andrews, Schwencke, et al., 2008; Titov, Andrews, Schwencke, et al., 2010; Titov, Dear, Ali, et al., 2015; Titov et al., 2014; Titov et al., 2011; Titov, Dear, Staples, et al., 2015; Titov et al., 2016;

Tortella-Feliu et al., 2011; Tulbure et al., 2015; Uebelacker et al., 2011; Ünlü et al., 2013; Van Ballegooijen et al., 2013; Van Bastelaar et al., 2011; Van den Berg et al., 2015; Van Straten, Cuijpers, and Smits, 2008; Vernmark et al., 2010; Wagner, Horn, and Maercker, 2014; Warmerdam et al., 2008; Watkins et al., 2012; Watts et al., 2013; Williams et al., 2013; Williams et al., 2015; Wims et al., 2010; Wolitzky-Taylor and Telch, 2010; Wozney et al., 2017; Yang et al., 2015; Zetterqvist et al., 2003).

The earliest study was published in 1991, and the number of studies of each year ranged from one in that year to 42 studies published in 2016. The evidence table in the appendix lists the details of the included studies.

Description of Published Studies

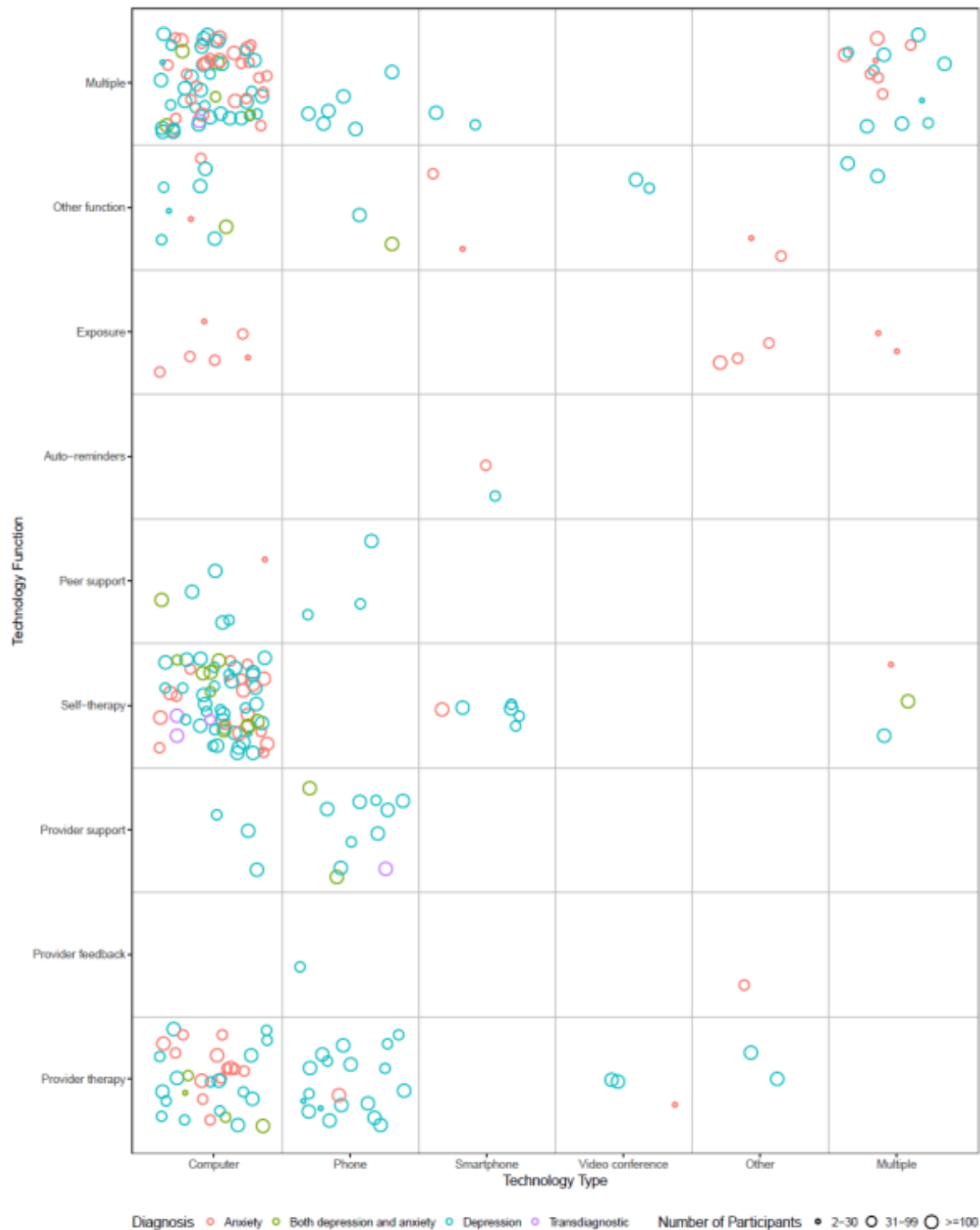
In this section, we list the key questions and provide figures used to represent the evidence base.

- Key Question 1: What Is the Research Volume Evaluating the Use of Technology to Augment Depression and Anxiety Care?
- Key Question 2: What Are the Types of Evaluated Technologies?
- Key Question 3: What Are the Functions of the Technologies?

To answer the key questions, we have documented the evidence in a bubble plot (Figure 3.1). Each bubble in the plot represents one of the 280 included RCTs. The size of the bubbles indicates the size of the study (number of participants), and the color shows the diagnoses treated (anxiety, depression, anxiety and depression, or transdiagnostic treatment).

The x-axis of the plot shows the types of technology used in treatment for patients with depression and anxiety. These technology types included computer/laptop, phone, smartphone only (with app or texting functions), other (including VCR/prerecorded videos), and multiple technology types used for treatment. The y-axis indicates the function performed by the technology. These included multiple functions within one treatment, exposure therapy (exposing phobic patients to their feared situation, e.g., through computer delivered images, virtual reality, or watching a video of themselves giving a speech), autoreminders, peer support (support given between patients), self-therapy (the patient completes a psychotherapy treatment program without provider guidance), provider support (support given by provider to one patient or a group of patients), provider feedback (as part of psychotherapy), and provider therapy (the provider guides a patient through a psychotherapy treatment program or individualized psychotherapy). The bubbles are “jittered”—that is, scattered somewhat in their vertical and horizontal placement, because of the large number of studies in individual categories.

Figure 3.1. Technology by Type and Function



NOTE: This bubble plot summarizes the RCT evidence of technological interventions for the clinical care of depression and anxiety disorders published to June 2017. Studies are categorized by technology function (y-axis), technology type (x-axis), diagnosis (bubble color), and sample size (bubble size). The bubbles are “jittered” in their vertical and horizontal placement for greater visibility.

We identified a large evidence base with 280 published RCTs. The majority of treatments were specified to treat anxiety (90 of the included studies, 32 percent) or depression (160 studies, 57 percent). There were five transdiagnostic applications (2 percent) that targeted a range of mental health indications, and 25 studies (9 percent) that involved treatment of both anxiety and depression.

In the studies examined, 260 out of 280 (93 percent) included 31 or more participants. Fifty-four percent were large studies that included 100 or more participants. In total, 109 studies (39 percent) included between 31 and 99 participants. The evidence base includes 20 small studies with up to 30 participants. The smallest study included only 13 participants (Pallavicini et al., 2009). The largest study, which recruited participants who spontaneously visited a self-help website for anxiety and depression, included 2,794 participants (Christensen et al., 2006).

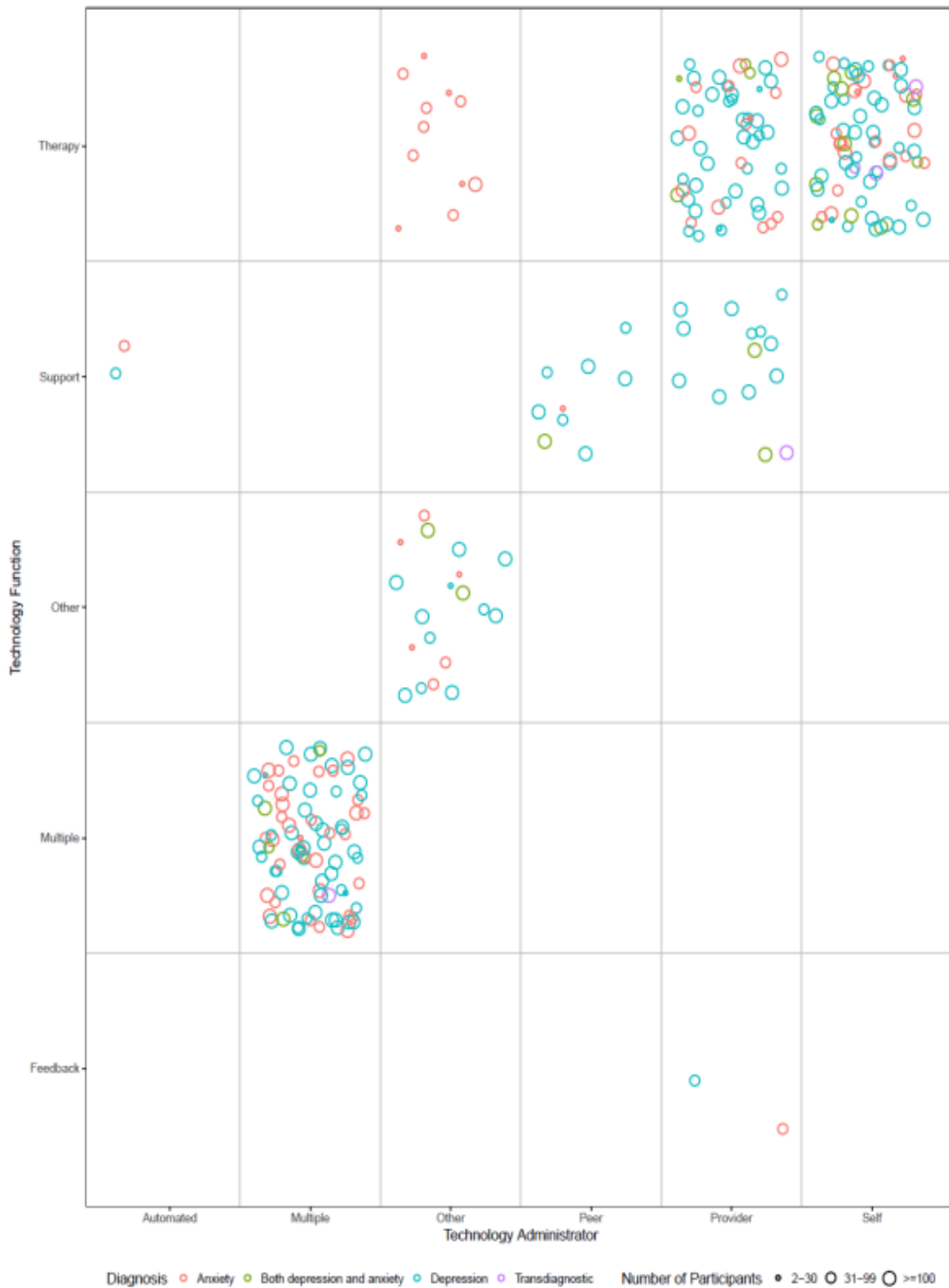
In examining this evidence map, the key questions regarding technology type and functions are answered. The majority of the studies used computer (190 studies, 68 percent) and phone (42 studies, 15 percent) technology, followed by 23 studies (8 percent) using more than one technology. Five studies (2 percent) used videoconference technology. The six studies in the “other” category (2 percent) included such technology as virtual-reality glasses, video in a movie theater setting, audiotape, and computer-based devices. The most common type and function combination was computer and self-therapy, and this included 19 studies of patients with an anxiety diagnosis (29 percent), 34 studies of depression (52 percent), ten studies including both clinical diagnoses (15 percent), and three transdiagnostic studies (5 percent). Other combinations included computer and multiple functions (2 studies of anxiety [5 percent], 34 studies of depression [81 percent], 5 studies of both [12 percent], 1 transdiagnostic study [2 percent]) and computer and provider therapy (13 studies of anxiety [38 percent], 17 studies of depression [50 percent], 4 studies of both [12 percent]). Fifty-three percent of computer applications of self- and provider-directed therapy had at least 100 participants.

Multiple types of technology often indicated a program designed to be used at home on a computer, with additional phone or text support. For example, the participants could complete self-directed psychotherapy via a computer with email and text-message reminders, requiring that they also use a smartphone to receive text messages (Carlbring et al., 2012). Often, this meant completing self-directed psychotherapy with additional support from a therapist by email and phone calls (Newby et al., 2017).

Key Question 4: What Is the Level of Ongoing Provider Involvement in the Evaluated Technology?

In Figure 3.2, we used a bubble plot to display the available literature regarding ongoing provider involvement in the evaluated technology. The plot displays the administrator of the technology, differentiating whether the intervention was directed by self, provider, other, multiple, or automated (x-axis) and the function of the technology (y-axis). It breaks down who is administering the key function types of therapy, support, other, multiple, or feedback. The figure uses the same color coding as Figure 3.1.

Figure 3.2. Technology by Function and Administrator



NOTE: This bubble plot categorizes published RCTs by technology function (y-axis), technology administrator (x-axis), diagnosis (bubble color), and sample size (bubble size). The bubbles are "jittered" in their vertical and horizontal placement for greater visibility.

Existing technology approaches are centered around self- or provider-directed treatments. A large number of studies used a combination of different administration formats. There were 84 studies of patient self-directed treatments (54 percent) and 73 studies of provider-directed treatments (46 percent). The most-common administrator and function combinations were self-directed therapy (75 studies [50 percent], including 14 percent anxiety, 27 percent depression, 7 percent anxiety and depression, and 2 percent transdiagnostic applications) and provider-directed therapy (57 studies [50 percent], including 13 percent anxiety, 33 percent depression, and 4 percent depression and anxiety indications).

Forty-five studies (60 percent) involving self-directed therapy and 28 studies involving provider-directed therapy (38 percent) had at least 100 participants. In two studies, feedback to patients was given by health care providers (1 percent of studies, provider feedback as part of psychotherapy). Support was given by the provider in 14 studies (5 percent), by other patients in nine studies (3 percent), or it was automated through reminders by smartphone in two studies (1 percent). One study assessed provider support offered through a Facebook connection (Mota Pereira, 2014). Psychotherapy was patient self-directed (27 percent), provider-directed (20 percent), or psychotherapy-administered through someone other than self, provider, other patients, or automated (4 percent).

A large number of studies (91 [33 percent]) described treatments that used multiple administrators and technology functions. These were mostly combined treatments, such as patient-directed with provider support (Nobis et al., 2015). Among these studies, 34 involved treatments for anxiety (37 percent), 51 involved treatments for depression (56 percent), five involved treatments for both (5 percent), and one was a transdiagnostic application (1 percent). Fifty-two of these studies examined at least 100 patients (57 percent), 36 examined 31 to 99 participants (40 percent), and three included only up to 30 participants (3 percent). Thirty studies (11 percent of all included trials) assessed functions not captured by these categories, such as avatar-based self-management or self-directed breathing retraining games (Pham et al., 2016).

Key Question 5: What Is the Direction of Effect in Studies Evaluating the Technology?

We also reviewed the reported treatment effects for a broad overview of the effectiveness of the technology. Treatment effects were the change compared with baseline as determined by the study authors. These were limited in that there was no comparison to a control condition. In Figure 3.3, there is more information about the evidence base by summarizing the treatment effect of the study.

The figure provides a visual indication of whether there was a negative effect or worsening of the symptoms associated with the technology intervention, no change, or a positive change of symptomatic improvement with the intervention on the x-axis. In all cases, Figure 3.3 shows the effect relative to baseline values, given that the comparator in the included studies varied widely.

We differentiated studies according to the function of technology on the y-axis, including multiple functions, other functions, exposure, autoreminders, peer support (support given

between patients), self-therapy (the patient completes a psychotherapy treatment program without provider guidance), provider support (support given by provider to one patient or a group of patients), provider feedback (as part of psychotherapy), and provider therapy (the provider guides a patient through a psychotherapy treatment program or individualized psychotherapy). This figure also shows the diagnosis treated. The technology type is represented by symbols indicating computer, phone, smartphone, videoconference, other, and multiple.

The plot differentiates the function and type of technology. Regardless of the function of the technology used, the majority (255 [91 percent]) of studies reported that the intervention had a positive outcome on symptoms, particularly for anxiety and depression.

Of 190 computer studies, 176 (93 percent) reported improvements. Of 42 phone studies, 34 (81 percent) reported improvements. Of 23 studies of multiple technologies, 21 (91 percent) reported improvements. Of 12 studies of smartphone technology, 5 studies of videoconferencing and 8 studies of other technology, all of them (100 percent) reported improvements.

Of the interventions with positive effects, 85 (33 percent) were treatments for anxiety, 144 (56 percent) were treatments for depression, 21 (8 percent) were treatments for both, and (2 percent) had transdiagnostic applications. One hundred and seventy-five studies (69 percent) with positive effects involved treatment delivery by computer, 34 (13 percent) by phone, 12 (5 percent) by smartphone, five (2 percent) by videoconference, two (1 percent) by video, and 21 (8 percent) by multiple technologies. Sixty-three studies (25 percent) of self-directed therapy reported positive effects, as well as 55 studies (22 percent) of provider-directed therapy, seven studies (3 percent) of self-directed support, 11 studies (4 percent) of provider-directed support, two studies (1 percent) of provider feedback, 11 studies (4 percent) of exposure interventions, two studies (1 percent) of autoreminders, 86 studies (34 percent) of multiple functions, and 18 studies (7 percent) of other functions.

There were 21 studies that reported no change (8 percent), particularly self-directed interventions, such as self-directed psychotherapy (11 studies [52 percent of studies reporting no change]) and patient-directed (self) support (2 studies [9 percent]), but also provider-directed psychotherapy (1 study [5 percent]), provider support (3 studies [14 percent]), other (1 study [5 percent]), and multiple (4 studies [18 percent]). Two provider-directed (1 percent) and one multiple (less than 1 percent) interventions had outcomes that were judged to be unclear. One study of self-directed psychotherapy by computer (less than 1 percent) found a negative effect or worsening of symptoms, measuring both depression and anxiety. This was a small study of 38 patients, with only 12 percent completing the treatment modules and 23 percent completing follow-up assessment. Acceptability of the technology in this particular study was not reported (Zetterqvist et al., 2003).

Figure 3.3. Effect of Technology by Technology Function



NOTE: This bubble plot categorizes included RCTs by technology function (y-axis), treatment effectiveness (x-axis), diagnosis (bubble color), and technology type (bubble shape). The shapes are “jittered” in their vertical and horizontal placement for greater visibility.

Key Question 6: What Is the Extent of Treatment Adherence and Reported Study Dropouts?

We also abstracted the percentage of patients who completed all of the components (modules) of treatment assigned. Some studies contacted patients who did not complete all modules or advised participants to complete all within a specific time frame and considered those who completed all to have completed the intervention.

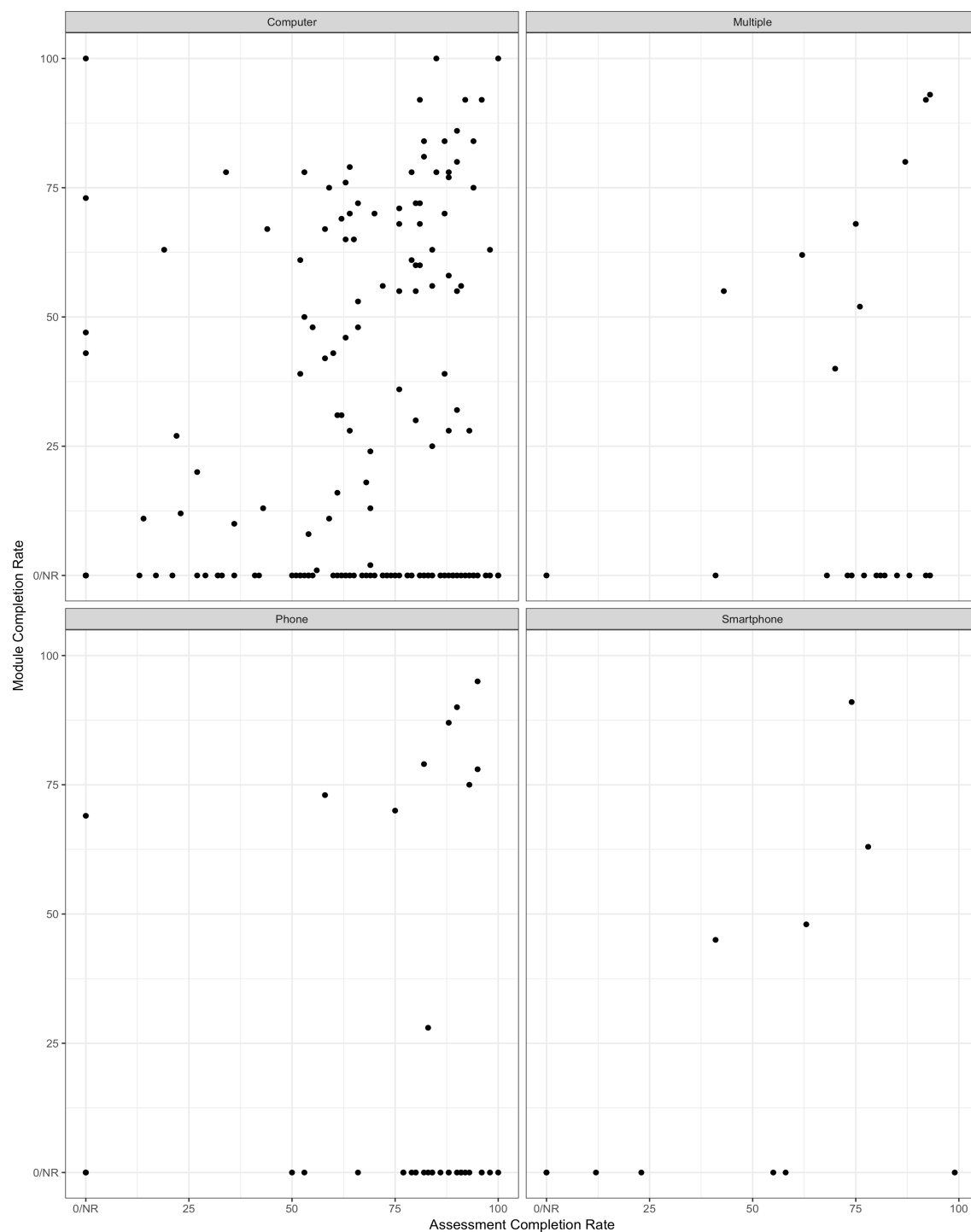
In addition, we abstracted the number of patients who completed the final follow-up assessment. The patients that did not complete the final follow-up assessment were considered dropouts.

Figure 3.4 shows each technology type presented with the percentage of patients completing the final follow-up assessment of the study on the x-axis and the percentage of patients adhering to all components of the treatment on the y-axis. Studies that did not report on these domains are included in the figures for comparison (see 0 line). All studies were assigned to one category only and were not counted multiple times.

Of the studies offering treatment by computer, phone, smartphone, or multiple types of technology, 236 (88 percent) reported the number of participants that completed follow-up assessments. The number of patients completing the assessment was highest in those interventions involving phones or multiple types of technology. The interventions involving computers had the third-highest rate of assessment completion, and smartphone interventions had the lowest rate. There were ten studies (4 percent of all published RCTs) that had a 100 percent follow-up assessment rate (Selmi et al., 1991; Beard and Amir, 2008; Millán-Calenti et al., 2015; Kanai et al., 2011; Hedman, Andersson, Andersson, et al., 2011; Eisdorfer et al., 2003; Dennis, 2003; Boettcher, Hasselrot, et al., 2014; Sandoval et al., 2016; Sethi, 2013). These tended to be the smaller studies, ranging from 36 to 225 participants with an average number of 86 participants.

There were 107 (38 percent) studies that reported on module completion rate. Module completion rates were available for those studies that evaluated treatments divided into specified individual components (or sessions). Many of the studies did not evaluate interventions involving modules, and, therefore, module completion rate was not applicable. Studies that involved treatment in modules were mostly computer applications, with 45 percent of computer studies reporting the module completion rate. In the studies involving smartphone technology, 33 percent reported on module completion rates. Module completion rates were reported for 24 percent of studies involving the phone. In studies involving multiple technology types, 35 percent reported module completion rates. The review of the studies reporting on retention showed that the completion rate varied widely. Very few studies documented full completion, with participants completing the entire treatment course.

Figure 3.4. Assessment and Module Completion Rates



NOTE: This series of scatter plots compare the assessment completion (x-axes) and module completion (y-axes) rates by intervention type (clockwise: computer, multiple, smartphone, phone) for RCTs that reported these outcomes. "0/NR" refers to 0 assessment/completion or not reported

Key Question 7: What Is the Acceptability of the Technology to Patients and Providers?

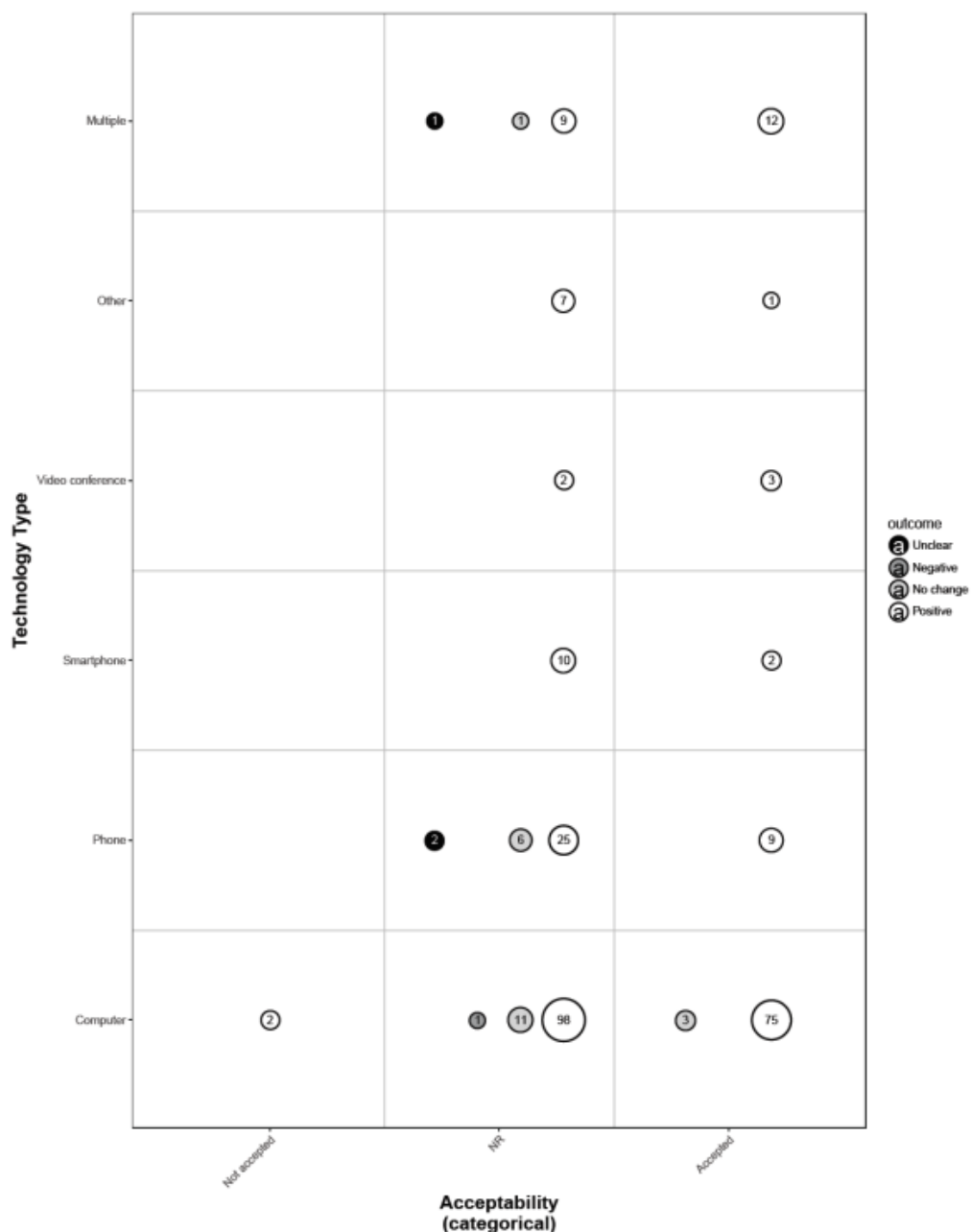
Figure 3.5 shows whether patients were accepting of the technology intervention. Acceptability was measured according to the authors' choice of measurement, typically with a question posed to patients, such as, "Did you find the treatment acceptable?" At least 50 percent of patients must have replied affirmatively for the study to be deemed acceptable. We did not identify any studies that measured clinician acceptance of the intervention. The x-axis displays reported acceptability of the technology (i.e., whether the majority of patients reported that the technology was well accepted, not accepted, or whether patient acceptability was not reported). The y-axis displays the types of technology examined, including multiple technologies used, video capabilities, smartphones, phones, computers, and other. The number of studies examining the technology is represented by the bubble size, and the number of studies is located in the middle of the bubble. In addition, the bubbles are shaded to reflect the symptomatic outcome of the treatment shown in Figure 3.3, with the darkest bubbles representing unclear outcomes, the darker gray bubbles representing negative outcomes, the lighter gray bubbles representing no change, and the clear bubbles for the studies representing positive outcomes.

The majority of RCTs (173, 62 percent) did not report on acceptability. These studies included 110 interventions conducted by computer (64 percent of studies reporting acceptability), 33 by phone (19 percent), 10 by smartphone (6 percent), two by videoconference (1 percent), seven by other means (4 percent), and 11 by multiple means (6 percent). Of the 107 studies that did report acceptability (38 percent of RCTs), 75 were interventions conducted by computer (70 percent of studies not reporting acceptability), 9 by phone (8 percent), 2 by smartphone (2 percent), three by videoconference (3 percent), one by other means (1 percent), and 12 by multiple means (11 percent). Ninety-eight percent of these studies reported that more than one-half of patients found the treatment to be acceptable. Only two studies (1 percent of studies reporting acceptability), both computer interventions, did not have at least one-half of patients finding the treatment acceptable (Tortella-Feliu et al., 2011; Dean, Potts, and Barker, 2016). These studies reported a positive effect on symptoms, but one did not report the rate of patients completing the follow-up assessment, and the other reported a follow-up assessment rate of only 13 percent. One of these studies reported that one participant complained of receiving bad advice from the peer-support group part of the intervention.

Key Question 8: What Are the Types of Potential Adverse Effects of the Technology?

Adverse events related to mode of administration were abstracted for each type of technology. Table 3.1 documents the presence or absence and the type of adverse events. There were 231 studies (83 percent) that did not address adverse events. Table 3.1 shows the data from the 49 studies (18 percent) that did address the presence or the absence of adverse events. The table is ordered by the type of technology.

Figure 3.5. Outcome by Acceptability and Technology Type



NOTE: This plot categorizes included studies by study acceptability (x-axis), technology type (y-axis), and effectiveness (bubble shading) for RCTs that reported these outcomes. At least 50 percent of participants must have reported the intervention acceptable. The number of studies in each category is listed in each bubble.

Table 3.1. Adverse Events Through Mode of Administration

Study ID	N in Technology Arm	Type of Technology	Type of Adverse Event
Andersson, Carlbring, and Furmark, 2012	27	Computer	None (publication explicitly says there was none)
Andersson, Carlbring, and Furmark, 2012	102	Computer	1 worsened symptom (Clinical Global Impression of 5)
Andersson, Hesser, et al., 2013	33	Computer	None (publication explicitly says there was none)
Andrews, Davies, and Titov, 2011	23	Computer	Not specified, only that 3 formally withdrew
Boeschoten et al., 2016	85	Computer	"Significant deterioration" in 7 (similar to control); 1 suicidal ideation
Brabyn et al., 2016	182	Computer	1 hospitalization, 2 life-threatening, 1 resulting in disability or incapacity (in treatment group)
Fischer et al., 2015	45	Computer	3 cases of worsening depression in control but none in treatment group. No new suicidal ideation
Gilbody et al., 2015	210	Computer	264 nonserious adverse effects, 19 serious adverse effects; 17 of these involved inpatient admission, 2 patients died; none involved persistent or considerable disability or incapacity or resulted in congenital anomaly or birth defect
Glozier et al., 2013	260	Computer	None (publication explicitly says there was none)
Grime, 2004	24	Computer	2 of the intervention participants required brief hospital admissions for acute anxiety symptoms
Hedman, Axelsson, et al., 2014	79	Computer	12% of cognitive behavioral therapy participants reported adverse effects, most commonly increased anxiety in early phase of therapy; no serious adverse effect
Hedman et al., 2016	32	Computer	6 intervention participants experienced adverse effects, most common was increased anxiety; no serious adverse effect
Høifødt et al., 2013	52	Computer	1 discontinued intervention for "got worse"; listed on dropouts, not as adverse effect
Hunkeler et al., 2012	51	Computer	1 suicide attempt
Johansson, Ekbladh, et al., 2012	46	Computer	2 patients in each group were minimally worse
Kenter et al., 2016	136	Computer	None (publication explicitly says there was none); 1 in control group committed suicide
Kivi et al., 2014	45	Computer	3 patients in the treatment group deteriorated during treatment
Klein, Richards, and Austin, 2006	19	Computer	1 relapse in a secondary bipolar disorder
Kok et al., 2014	105	Computer	None (publication explicitly says there was none); no adverse events reported or observed
Lappalainen et al., 2015	19	Computer	1 in treatment group discontinued because of hospitalization for unknown reason
Littlewood et al., 2015	210	Computer	None (publication explicitly says there was none)
Luxton et al., 2016	62	Computer	7 in treatment group. None of these adverse effects (e.g., severe exacerbation of asthma symptoms) were determined to be related to study procedures; 1 was assessed in the emergency department for suicidality
Meyer et al., 2009	320	Computer	None (publication explicitly says there were none); none stated "did more harm than helped"

Morris, Schueller, and Picard, 2015	135	Computer	"One study participant composed several troubling and off-topic posts"
Phillips et al., 2014	318	Computer	None (publication explicitly says there was none)
Pinto et al., 2016	NR	Computer	None (publication explicitly says there was none)
Proudfoot et al., 2003	89	Computer	16 quit because of difficulty using the computer, negative features of the program or poor clinical progress
Rosmarin et al., 2010	83	Computer	None (publication explicitly says there was none)
Sandoval et al., 2016	25	Computer	No participants had suicidality or worsened depression
Schulz et al., 2016	60	Computer	3 in group treatment had worsened symptoms
Titov et al., 2011	39	Computer	None (publication explicitly says there was none); authors examined negative outcomes and found not related to treatment
Van Ballegooijen et al., 2013	63	Computer	1, not specified
Zetterqvist et al., 2003	38	Computer	None (publication explicitly says there was none)
Mohr et al., 2013	34	Multiple: phone and computer	None (publication explicitly says there was none)
Birney et al., 2016	150	Multiple: smartphone or computer/laptop	None (publication explicitly says there was none)
Egede et al., 2015	120	Other: analogue videophone	None (publication explicitly says there was none)
Nilsson and Lundh, 2016	20	Other: audiotape	None (publication explicitly says there was none)
Bombardier et al., 2013	44	Phone	The intervention did not cause multiple sclerosis symptoms to worsen
Brenes et al., 2015	70	Phone	4 participants in the treatment group experienced an increase in symptoms per Penn State Worry Questionnaire (abbreviated version) and Beck Depression Inventory
Furukawa et al., 2012	58	Phone	None (publication explicitly says there was none)
Himelhoch et al., 2013	16	Phone	None (publication explicitly says there was none)
Ludman et al., 2007	198	Phone	None (publication explicitly says there was none)
Mohr et al., 2005	62	Phone	1 participant in the intervention group reported being sexually assaulted during treatment and began showing signs of dissociation
Mohr et al., 2012	163	Phone	None (publication explicitly says there was none)
Rollman et al., 2009	150	Phone	None (publication explicitly says there was none)
Salisbury et al., 2016	307	Phone	34 reported adverse effects, of which one was related to the intervention (increased anxiety from talking about depression)
Watkins et al., 2012	40	Phone	None (publication explicitly says there was none); 1 patient committed suicide, but they were in the TAU group
LaFreniere and Newman, 2016	NR	Smartphone	One patient withdrew due to discomfort attending to worries; she was informed of treatment options, but reported no harm.
Ly et al., 2015	46	Smartphone	None (publication explicitly says there was none)

Twenty-three studies (47 percent of those addressing adverse events) explicitly reported that no adverse events occurred. Twenty-six studies (53 percent) reported specific adverse events. Twelve of the studies (24 percent) reported on worsening of symptoms, and four (8 percent)

reported on suicidality. Other events varied. One technology-specific event included a report of a patient putting troubling posts in an online peer forum (Morris, Schueller, and Picard, 2015), and one study stated that several participants left the study because of difficulty using the computer, negative features of the program, or poor clinical progress (Proudfoot et al., 2003). There were no reports of privacy breaches, lost communication, or diagnostic mistakes. There was no specific report of misunderstandings or boundary violations, although one study reported that one patient reported being sexually assaulted during treatment and did not complete the study (Mohr et al., 2005).

Evidence Gaps and Upcoming Research

This evidence map documents the existing literature and the research gaps in the evidence base. The figures indicate where there are few or no published studies for a particular type of technology or a particular function the technology serves. We identified five studies of videoconference use and 12 studies of smartphone use and compared them with 190 studies of computer use and 42 studies of phone use. Regarding the function of the technology, there are only two published RCTs of provider feedback, two studies of autoreminders, six studies of peer support, and 11 studies of exposure, compared with 75 studies of self-therapy and 57 studies of provider therapy. Future research into whether self-directed versus provider-directed interventions are more effective would be valuable in determining whether the allocation of resources to provider-directed interventions may be warranted. We did not identify studies that examined provider acceptability of the interventions. Furthermore, given the high attrition rates of RCTs, research into whether acceptability affects attrition could determine whether further efforts should be aimed at making sure that proposed treatments have been determined to be well accepted.

In addition to published RCTs, this evidence map contains an overview of registered trials that have not been published yet. A table that documents the upcoming trials is included in the appendix of this report (Table A.2). This presents a vision of what future research in this area would look like.

We identified 102 ongoing trials registered in clinicaltrials.gov and indicated new research into technology in the care of depression and anxiety disorders. Judging from the available information, it appears that 42 of these trials are evaluating Internet-based psychotherapy (41 percent). Nineteen of these trials are using smartphone technology (19 percent). Twelve trials are evaluating technology in primary care or collaborative care (12 percent). Four trials are examining treatment through social media and online peer networks or support groups (4 percent).

Three of the ongoing trials target veterans, but we did not identify trials that specifically targeted active military personnel.

4. Discussion

This evidence map provides an overview of the broad research field of the use of technology to augment clinical care in depression and anxiety disorders, including telemedicine and telehealth. We summarized the evidence published in RCTs and anticipated evidence reported in registered but as yet unpublished RCTs.

Quality of Evidence

We identified a large evidence base: 280 RCTs that have been published to date. The studies provide effectiveness information in a robust study design (i.e., RCTs). RCTs can allow readers to draw strong evidence statements, a critical aspect for clinical practice guideline decisions. Our review of available studies suggests that depression and anxiety treatment by computer has received the most research attention, followed by approaches incorporating phones into clinical care. The evidence base for these approaches consists of numerous studies in different patient samples, published by independent research groups. This map of the evidence base also shows that, in many published studies, multiple technology functions are combined within interventions, such as self-directed psychotherapy with provider support. Existing technology evaluations are centered around self-directed or provider-directed treatments, and one-third of existing studies used a combination of different administration formats. However, only 1 percent of studies published to date examined automated administration, and more research is likely needed to determine the use of this feature in clinical care.

A key factor in deciding whether to implement new technologies is whether they are effective in reducing symptoms. More than 90 percent of the studies included in this evidence map reported a positive effect for depression and/or anxiety symptoms at follow-up assessment compared with baseline. The evidence base consistently suggested a positive direction of effects—that is, studies reporting favorable results of the technology-treatment approach. Regardless of the type or function of technology, only a few studies reported no symptom improvement compared with baseline. Although there may be a bias toward publishing positive results, nonetheless, 21 studies found no change, and one found a worsening of symptoms. A review of these studies showed these were primarily patient self-directed interventions, such as self-directed psychotherapy or patient-directed support. It is also noteworthy that one-half of the identified studies have 100 or more participants. Studies with large sample sizes have more potential to provide precise treatment estimates. Judging from this broad overview of the evidence, a substantial number of studies have been published that will be useful for evidence syntheses that aim to determine the size of treatment effects.

One clinical concern for treatments offered outside of the clinical setting is patient retention. Although studies consistently reported positive signals and the evidence base includes a substantial number of large studies, we also mapped two aspects of study limitations: treatment retention and loss of follow-up. The map shows that only a small proportion of studies reported on whether patients completed modules within a treatment. Studies that reported on module-completion rates showed that completion rates varied widely and very few studies documented full completion, with participants completing the entire treatment course. It should be noted that there were few studies that clearly stated that completing all modules was required. Many of the included studies did not evaluate interventions involving modules, and therefore module-completion rate was not applicable. However, it is noteworthy that, in this evidence map sample, only three studies reported 100 percent module completion. Furthermore, studies that reported study dropouts showed that there was great variation across studies. Across all studies, we found that very few studies reported on complete samples—that is, less than 5 percent of all identified RCTs. Both aspects of study limitations lower the quality of the evidence and have to be taken into account when reviewing intervention effects in more detail.

In addition to providing a broad overview of the characteristics of the available research in terms of type and function of technology and a broad signal of clinical effectiveness, our evidence map aimed to provide an overview of the acceptability of the evaluated technology approaches. Before implementing treatments, it is important to know whether those involved will find them acceptable. However, only 38 percent of published RCTs measured acceptability of treatment to patients. In addition, none of the identified studies reported on the acceptability of the treatment to clinicians. Although more data on acceptability would be desirable, it is noteworthy that the trials that did address patient acceptability consistently reported that the majority of patients found the treatment to be acceptable. Of note, for those three studies that did not report the majority of patients finding it acceptable, the effect on symptoms was still positive.

Finally, few studies addressed adverse events and, to date, there is only limited empirical evidence regarding the presence or absence of adverse events associated with these interventions. One-half of those RCTs that did report on adverse events specified that there were none. Reported adverse events mostly included worsening of symptoms (24 percent of studies), and some studies reported on suicidality. Other reported events varied; technology-specific events included a report of a patient putting troubling posts in an online peer forum. Given the small number of studies assessing adverse events, it is difficult to state clearly the safety of these treatments. Privacy breaches must be considered when combining health information and technology, but the presence or absence of side effects of this nature was not reported. It is unknown if this type of event was assessed, making it impossible to state that this is not an issue.

General Discussion and Practice Implications

For this evidence map, we chose the type of technologies that scoping searches revealed were most common. In addition, we further defined the treatments by identifying what function the technology served. The most common type of evaluated technology application is currently computer-based psychotherapy, which has the potential to expand access to mental health care. A systematic review and meta-analysis of computer-based psychological treatments for depression analyzed 40 studies and found this treatment to be effective (Richards and Richardson, 2012). A meta-analysis of computerized cognitive training for depression examined nine trials and also found this treatment to be effective (Motter et al., 2016). In addition, treatments by phone or computer may be helpful for those who experience a stigma associated with mental illness and would not seek help outside the home but may be able to access services through technology in their homes (Corrigan, 2004).

Because a lack of qualified providers and the cost of using providers for treatment are often identified as barriers to accessing mental health, we further delineated our findings by providing an additional bubble plot that compared the function of the technology by who was administering it. As outlined, both self-directed and provider-directed psychotherapy were well represented, with 143 studies. There were 14 studies of support that used involvement by a health care provider, but also two studies of automated support and nine studies of patients directing support with one another, such as through online support groups. There was support through automated means, such as through text messages. Feedback studies were limited to studies done by providers. A large number of studies did not fit into these categories and bear further exploration. The majority of these studies were using multiple functions and/or administrators. It is possible that a combination of therapies increases positive outcomes.

We also evaluated the applicability of the identified body of literature to the military health system. The study populations in the included studies were primarily civilians, with only nine of the studies documenting a military population (Luxton et al., 2016; Stetz et al., 2011; Ruskin, 2004; Pyne et al., 2010; Mohr et al., 2005; Mohr et al., 2011; Kahn, Collinge, and Soltysik, 2016; Fortney et al., 2007; Egede et al., 2015). Of these military studies, seven were treating depression, one anxiety, and one was transdiagnostic. Six of the studies focused on provider-directed treatment of depression by phone or videophone. Two of the studies focused on treatment by computer, with one of these being transdiagnostic self-directed treatment and the other being provider-directed treatment of anxiety. One study focused on treatment of anxiety by showing relaxation exercises videos in a movie theater setting. Four of these studies that measured acceptance found the treatments acceptable to patients. Seven of the treatments had a positive outcome on symptoms, and two of the provider-directed phone treatments for depression found no change. These studies had a follow-up rate ranging between 65 to 98 percent.

Comparison with Other Research

Our evidence map echoes the findings of a recent evidence map created by the Agency for Healthcare Research and Quality that provided a general overview of the evidence about telehealth, which included behavioral health (Totten et al., 2016). That report used a bubble-plot format to display the distribution of evidence from systematic reviews in terms of volume (number of reviews and number of patients in included studies), conclusions about benefit by clinical focus, and telehealth function. The authors also determined how much evidence was available about combinations of clinical areas and telehealth functions reported in the existing systematic reviews. For behavioral health, they used systematic reviews for the treatment of depression, anxiety, and addiction (including substance abuse, smoking, alcohol abuse, and pathological gambling). The map included seven systematic reviews examining 137 studies (83 RCTs) and 32,770 patients. The authors of the studies determined that there was sufficient evidence to support the effectiveness of telehealth for psychotherapy as a part of behavioral health. Of the RCTs that were analyzed in the included systematic reviews in the evidence map by Totten et al. (2016), 58 evaluated psychotherapy, compared with 129 primary studies identified in our evidence map. We also further divided by provider-directed and self-directed psychotherapy and separated these studies by type of technology. Most of the behavioral health studies they found reported benefit or potential benefit, except for one that found insufficient evidence for correctional or forensic psychiatry. This is similar to our findings of positive outcomes for all but one of our studies.

Our evidence map also found similar results to a recent systematic review. That review reported that if online interventions included either in-person or online therapist or administrative support, there were better outcomes and greater treatment retention (Richards and Richardson, 2012). In that evidence map, the number of patients completing the follow-up assessment was highest in those interventions that involved provider support, such as with phones or smartphones or multiple technologies that included a phone (and therefore provider) component.

As highlighted, module completion rate was limited in our identified sample, ranging from 45 percent in computer studies to 24 percent of studies involving the phone. However, almost all of our studies reported positive results. This echoes the findings of another systematic review that found that study participants with anxiety and depression experience beneficial outcomes from both partial and full completion of online intervention modules (Donkin et al., 2011).

Another review summarized the findings of ten systematic reviews of telepsychiatry. That report (Chippis, Brysiewicz, and Mars, 2012) emphasized the feasibility of use in resource-constrained environments, with studies in the reviews conducted in the United States, Canada, Europe, Australia, Japan, and Hong Kong. Many of the studies presented in that evidence map were in resource-constrained environments, with the express purpose of finding more-economical ways to bring mental health treatment to those areas or populations. The researchers reported that the systemic reviews were of acceptable quality but that common deficiencies were

lack of grading the strength of evidence or linking the quality of the included studies to the conclusions. Consistent with our evidence map finding, the review of reviews concluded that telepsychiatry is as effective as face-to-face treatment and does improve symptoms (Chippis, Brysiewicz, and Mars, 2012).

Limitations

An evidence map is a broad overview that helps to organize a larger literature for multiple reasons, including identifying promising areas that should be reviewed in more detail in future systematic reviews and possibly identifying or refining an agenda for primary research. However, it cannot provide accurate estimates of the effectiveness of interventions or the magnitude of effects across studies, provide a detailed critical appraisal of the studies and research results, or evaluate the quality of evidence at the level of systematic reviews. We attempted to capture as many studies as possible by using a large number of search terms. However, there is varied terminology employed when describing technological interventions. Therefore, it is possible that there are studies that were not captured by our search and therefore not included in this evidence map.

Given the large body of literature, evidence maps must focus on a limited number of characteristics. We attempted to capture the types of technology and the functions of technology that a scoping search suggested would be most likely. However, a large number of studies fell into the “other” or “multiple” categories. These studies addressed unique and study-specific technology or used multiple types of technology, multiple technology administrators, and multiple functions within the technology type. Almost all of these studies of combining technologies and functions showed positive symptom outcomes; therefore, there may be technologies that are more effective when combined, although that is not defined in this evidence map. In addition, it is possible that more-effective treatment might result from combining technologies or functions, but the particular items combined would need to be delineated more than an evidence map is able to do.

It is also noteworthy that, in this broad-stroke overview, the large majority of studies appeared to have positive effects. When abstracting data regarding outcomes, we allowed for any measurement of symptom improvement. We abstracted data provided by the authors about whether the treatment had a positive outcome on symptoms. This could be done in a variety of ways, including patient report, clinician assessment, or need for further care. These symptoms were assessed by a variety of scales or not using a formal assessment scale. In addition, the effects were not determined in comparison to a concurrent control group receiving TAU or active controls, but rather to the baseline of the treatment group. Furthermore, there is no indication of clinical significance (effect size, symptom remission) of the positive effect. It is likely that there would have been a different number of studies with a positive outcome if all studies were held to the same standard for determining this result. A meta-analysis is needed to determine the size of

the treatment effect and for a more refined discussion of the effects of technology in depression and anxiety care. Finally, it is also possible that there is reporting bias in this literature and that the included studies highlighted positive effects in selected outcomes.

We abstracted information on module completion, but very few studies explicitly stated that module completion was a requirement of the intervention. Patients may report symptomatic improvement regardless of whether they completed all of the modules of a particular intervention. It is possible that participants' completion of all modules, rather than as many as they desire or require for symptom resolution, is affected by whether participants were told that completion of all modules was required. However, information on the requirement was usually not reported.

Furthermore, this evidence map does not provide a detailed critical appraisal of the included studies and the presented research results. A systematic review concentrating on specific intervention included in this broad overview is needed for a more detailed review of the evidence.

Finally, the evidence map provides only a broad overview of the literature, and we applied only a small number of dimensions to assess the quality of evidence across available studies. A systematic review for individual studies of included interventions and outcomes should adopt a more-detailed assessment of the quality of evidence to grade the confidence in individual evidence statements.

Future Research

The evidence map also allows for an exploration of evidence gaps regarding the use of technology in anxiety and depression treatment. In fact, an evidence map is often explicitly used not only to identify relevant evidence but to initiate the process of developing a research agenda that can address remaining gaps (Miake-Lye et al., 2016).

Although most of the study authors reported positive effects, the issue of the effect size of technological interventions and how those effect sizes compare with usual treatment is of critical importance to the question of whether to increase access through technology or increase access to more traditional interventions. Additional systematic reviews and meta-analyses are required to determine the effect size to guide implementation of the technologies presented.

This evidence map has identified several research gaps. In particular, in terms of the type of evaluated technology, we identified five studies that assessed videoconference interventions and 12 that assessed smartphone interventions, although a large number of studies assessed computer and phone interventions. Studies focused on smartphone approaches were less numerous than studies on phone or computer use. We hypothesize that research involving smartphone interventions will likely grow, as research may not have yet caught up with the extent of smartphone use. Given the fact that so many patients have smartphone technology available to them, more studies involving this technology could be beneficial.

Only two published RCTs assessed provider feedback, and the role of this technological

function in depression and anxiety care remains unclear. The large majority of reviewed studies reported a positive change compared with baseline values. Most of the studies that did not find a positive change were those of self-directed psychotherapy or patient-directed support. Further research into whether self-directed versus provider-directed interventions are more effective would be valuable in determining whether the allocation of resources to provider-directed interventions may be warranted.

Two hundred and forty-one studies reported on treatment adherence and/or study dropouts. Future research examining whether provider-directed therapies lead to greater adherence than self-directed ones and if adherence leads to better outcomes would be useful in helping health care systems decide on the level of provider involvement required, given that treatment by phone tended to have the highest module-completion rate and that psychotherapy by phone was provider directed.

A proportion of the included studies evaluated acceptability of the technology, with 86 reporting that 50 percent or more of patients found that the treatment was acceptable. It is noteworthy that there were no studies that examined provider acceptability of the included interventions. Although many studies required provider involvement, there were none that reported on provider acceptance, which could be an important factor in implementation. In deciding to invest in provider-directed treatments, future research looking at how providers assessed those treatments and whether the acceptability of treatments affect symptom outcomes would be advised. It would be helpful to compare the effectiveness of provider-directed treatments with self-directed treatments and the factors affecting treatment adherence. In particular, treatments involving multiple types of technology often meant there was provider involvement, and these treatments achieved higher adherence rates than computer interventions alone. Further research should be carried out to delineate the role of providers. In addition, given the high attrition rates of the treatment modality, research into whether acceptability affects attrition could determine whether further efforts should be aimed at making sure that proposed treatments have been determined to be well accepted.

We noted that few of the included studies addressed adverse events, leaving the safety of these treatment modalities in question. More empirical evidence is needed for information regarding the presence and absence of adverse events, in particular those that have been raised as concerns for technology interventions, such as privacy breaches, and those related to safety, including suicidal ideation, suicide attempts, hospitalizations, and deaths by suicide. Future studies should explicitly report on adverse events potentially associated with the technology.

We identified a substantial number of ongoing trials. Almost one-half of the new studies are evaluating Internet-based psychotherapy. Nineteen of the ongoing trials are using smartphone technology. Twelve trials are evaluating technology in primary care or collaborative care. Four trials are examining treatment through social media and online peer networks or support groups. We also identified three ongoing trials that target veterans but none that focus on active military personnel.

Conclusion

This evidence map provides a broad overview about the types and functions of technology used to augment clinical care in depression and anxiety disorders. We identified a large evidence base, with the most research dedicated to computer and phone treatments for self- or provider-directed psychotherapy. All types of technology had a large majority of studies reporting positive effects. Studies that reported on module-completion rates showed that completion rates varied widely. Studies that reported dropouts also showed variation, and few studies reported on completed samples. The available studies that reported on acceptance consistently showed high acceptance rates. There is little available information on adverse events of technology in clinical care.

Ongoing trials primarily address Internet-based psychotherapies, as well as smartphone technology and implementing technology in primary care. Several areas of future research were identified, including a need for more studies of smartphones because there are far fewer of those than there are for phone and computer interventions. Evaluations also should be made about whether provider-directed versus self-directed interventions are more effective and are more likely to improve treatment adherence. Additionally, more research on provider acceptability is needed.

This evidence map makes a significant contribution to our knowledge of the current evidence base of the use of technology in depression and anxiety care by providing a broad overview of the available research. In addition, this evidence map delineates gaps in the available evidence to assist in setting future research agendas.

Appendix A. Search Methodology

DATABASE SEARCHED AND TIME PERIOD COVERED

PubMed, from inception to June 28, 2017.

LANGUAGE

English

SEARCH STRATEGY

"Telemedicine"[Mesh] OR telemedicine[tiab] OR telehealth[ti] OR email[tiab] OR internet[ti] OR video[tiab] OR videos[tiab] OR skype[tiab] OR computer-based OR phone-based OR telephone-based OR web-based[tiab] OR computerized OR smartphone OR avatar OR "information and communication technology" OR ict OR cell phone* OR mobile phone* OR "interactive voice response" OR text message* OR "digital communication" OR "e-health" OR (virtual AND communicat*) OR "interactive video" OR web-cam* OR webcam* OR remote monitor* OR remotely monitor* OR two-way camera* OR personal monitor* OR web-based portal* OR social network* OR "secure chat" OR chatroom* OR chat room* OR online[tiab] OR online[ot] OR information technolog*

AND

"Anxiety Disorders"[Mesh] OR "Depressive Disorder"[Mesh] OR anxiety OR phobia* OR panic OR depressive disorder* OR depression[tiab] OR depression[ot] OR depressive[tiab] OR depressive[ot] OR dysthymi*

AND

"Professional-Patient Relations"[mh] OR "Health Services Accessibility"[mh] OR physician-patient relation* OR patient-physician relation* OR doctor-patient relation* OR patient-doctor relation* OR access*[tiab] OR access*[ot]

AND

randomi* OR "random allocation" OR rct* OR Filters: Randomized Controlled Trial

=====

DATABASE SEARCHED AND TIME PERIOD COVERED

PsycINFO, from inception to June 28, 2017.

LANGUAGE

English

SEARCH STRATEGY

TI, SU, AB (telemedicine OR telehealth OR email OR internet OR video OR videos OR skype OR computer-based OR phone-based OR telephone-based OR web-based OR computerized OR smartphone OR avatar OR "information and communication technology" OR ict OR "cell phone" OR "cell phones" OR cellphone* OR "mobile phone" OR "mobile phones" OR "interactive voice response" OR "text message" OR "text messages" OR "text messaging" OR "digital communication" OR "e-health" OR (virtual AND communicat*)) OR DE "Information Technology" OR DE "Automated Information Processing" OR DE "Bioinformatics" OR TI, SU, AB ("interactive video" OR web-cam* OR webcam* OR "remote monitoring" OR "remote monitor" OR "remote monitors" OR "remotely monitor" OR "remotely monitoring" OR "two-way camera" OR "two-way cameras" OR "personal monitor" OR "personal monitors" OR "web-based portal" OR "web-based portals" OR "social

network" OR "social networks" OR "social networking" OR chatroom* OR "chat room" OR "chat rooms" OR online)

AND

DE "Major Depression" OR DE "Anaclitic Depression" OR DE "Dysthymic Disorder" OR DE "Endogenous Depression" OR DE "Late Life Depression" OR DE "Reactive Depression" OR DE "Recurrent Depression" OR DE "Treatment Resistant Depression" OR DE "Anxiety" OR DE "Social Anxiety" OR DE "Anxiety Management" OR DE "Panic" OR DE "Phobias" OR DE "Anxiety Disorders" OR DE "Generalized Anxiety Disorder" OR DE "Obsessive Compulsive Disorder" OR DE "Panic Disorder" OR TI (anxiety OR phobia* OR panic OR depression OR depressive) OR SU (anxiety OR phobia* OR panic OR depression OR depressive OR dysthym*) OR AB (anxiety OR phobia* OR panic OR depression OR depressive)

AND

TI ("physician-patient relationship" OR "patient-physician relationship" OR "physician-patient relations" OR "patient-physician relations" OR "professional-patient relationship" OR "professional-patient relations" OR access*) OR SU ("physician-patient relationship" OR "patient-physician relationship" OR "physician-patient relations" OR "patient-physician relations" OR "professional-patient relationship" OR "professional-patient relations" OR access*) OR AB ("physician-patient relationship" OR "patient-physician relationship" OR "physician-patient relations" OR "patient-physician relations" OR "professional-patient relationship" OR "professional-patient relations" OR access*)

AND

TI (randomi* OR "random allocation" OR rct*) OR SU (randomi* OR "random allocation" OR rct*) OR AB (randomi* OR "random allocation" OR rct*)

DATABASE SEARCHED AND TIME PERIOD COVERED

Web of Science, from inception to June 28, 2017.

LANGUAGE

English

SEARCH STRATEGY

ts=(telemedicine OR telehealth OR email OR internet OR video OR videos OR skype OR computer-based OR phone-based OR telephone-based OR web-based OR computerized OR smartphone OR avatar OR "information and communication technology" OR ict OR "cell phone" OR "cell phones" OR cellphone* OR "mobile phone" OR "mobile phones" OR "interactive voice response" OR "text message" OR "text messages" OR "text messaging" OR "digital communication" OR "e-health" OR (virtual AND communicat*) OR "Information Technology" OR "Automated Information Processing" OR "Bioinformatics" OR "interactive video" OR web-cam* OR webcam* OR "remote monitoring" OR "remote monitor" OR "remote monitors" OR "remotely monitor" OR "remotely monitoring" OR "two-way camera" OR "two-way cameras" OR "personal monitor" OR "personal monitors" OR "web-based portal" OR "web-based portals" OR "social network" OR "social networks" OR "social networking" OR chatroom* OR "chat room" OR "chat rooms" OR online)

AND

ts=(anxiety OR phobia* OR panic OR depression OR depressive OR dysthym*)

AND

ts=("physician-patient relationship" OR "patient-physician relationship" OR "physician-patient relations" OR "patient-physician relations" OR "professional-patient relationship" OR "professional-patient relations" OR access*)

AND

ts=(randomi* OR "random allocation" OR rct*)

=====

DATABASE SEARCHED AND TIME PERIOD COVERED

Cochrane CENTRAL, from inception to June 28, 2017.

LANGUAGE

English

SEARCH STRATEGY

telemedicine or telehealth or email or internet or video or videos or skype or computer-based or phone-based or telephone-based or web-based or computerized or smartphone or avatar or "information and communication technology" or ict or "cell phone" or "cell phones" or cellphone* or "mobile phone" or "mobile phones" or "interactive voice response" or "text message" or "text messages" or "text messaging" or "digital communication" or "e-health" or (virtual and communicat*) or "information technology" or "interactive video" or web-cam* or webcam* or "remote monitoring" or "remote monitor" or "remote monitors" or "remotely monitor" or "remotely monitoring" or "two-way camera" or "two-way cameras" or "personal monitor" or "personal monitors" or "web-based portal" or "web-based portals" or "social network" or "social networks" or "social networking" or chatroom* or "chat room" or "chat rooms" or online:ti,ab,kw (Word variations have been searched) OR MeSH descriptor: [Telemedicine] explode all trees AND

anxiety or phobia* or panic or depression or depressive or dysthym*:ti,ab,kw (Word variations have been searched) OR MeSH descriptor: [Depression] this term only OR MeSH descriptor: [Depressive Disorder] explode all trees OR MeSH descriptor: [Anxiety] this term only OR MeSH descriptor: [Panic] this term only

AND

"physician-patient relationship" or "patient-physician relationship" or "physician-patient relations" or "patient-physician relations" or "professional-patient relationship" or "professional-patient relations" or access*:ti,ab,kw (Word variations have been searched) OR MeSH descriptor: [Professional-Patient Relations] explode all trees OR MeSH descriptor: [Health Services Accessibility] explode all trees

=====

DATABASE SEARCHED AND TIME PERIOD COVERED

ClinicalTrials.gov, from inception to July 24, 2017.

SEARCH STRATEGY

CONDITION/DISEASE: Depressive Disorder OR depress* OR anxiety OR panic OR Dysthymic Disorder OR dysthymia

INTERVENTION/TREATMENT: Telemedicine OR internet OR web OR online OR smartphone OR "smart phone" OR "mobile phone" OR "mobile phones" OR "computer-based" OR e-health OR "social network" OR "social networks" OR facebook OR twitter OR "information technology" OR "cell phone*"

FILTERED BY "INTERVENTIONAL STUDIES"

Figure A.1. Flow Diagram

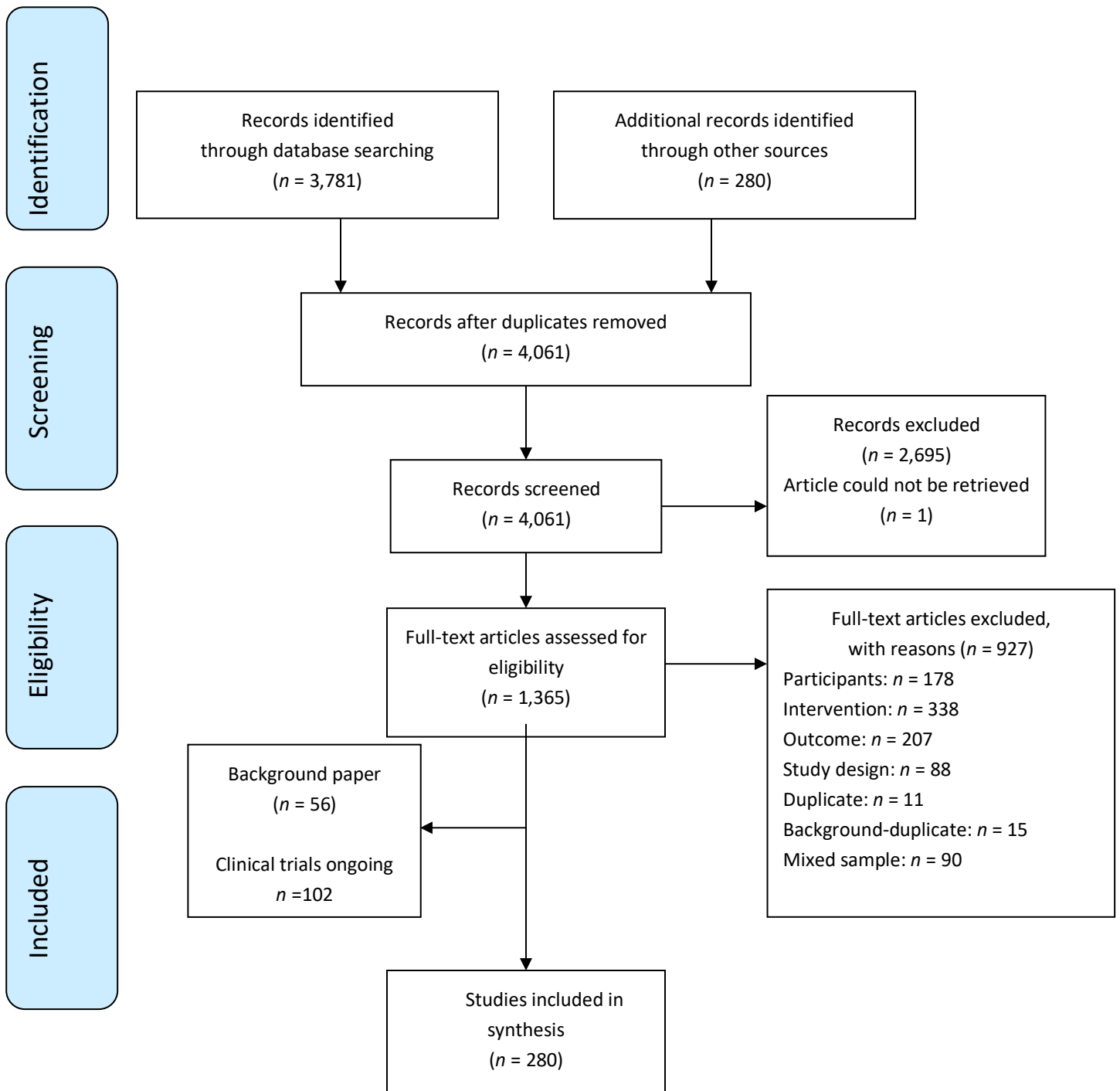


Table A.1. Evidence Table

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
Adler et al., 2015 N=167 Depression	TAU Civilian	Type: Phone Function: Multiple	Feasibility: Unclear Acceptability: NR	Module completion: NR Follow-up: 92%	Effectiveness: Positive AE: NR
Alavi et al., 2016 N=93 Depression	No treatment Civilian	Type: Computer Function: Provider therapy	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 89%	Effectiveness: Positive AE: NR
Alegria et al., 2014 N = 257 Depression	TAU, other: Face-to-face provider-directed cognitive behavioral therapy (CBT) and care management Civilian	Type: Phone Function: Multiple	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: NR	Effectiveness: Positive AE: NR
Allen et al., 2016 N = 67 Anxiety	Wait-list Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: Accepted	Module completion: 63% Follow-up: 19%	Effectiveness: Positive AE: NR
Andersson et al., 2005 N = 117 Depression	Alternative Civilian	Type: Computer Function: Multiple	Feasibility: Unclear Acceptability: NR	Module completion: 65% Follow-up: 63%	Effectiveness: Positive AE: NR
Andersson et al., 2006 N = 64 Anxiety	Wait-list Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: NR	Module completion: 56% Follow-up: 91%	Effectiveness: Positive AE: NR
Andersson et al., 2009 N = 30 Anxiety	Other: One-session in-person exposure Civilian	Type: Multiple Function: Exposure	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: NR	Effectiveness: Positive AE: NR
Andersson, Paxling, et al., 2012 N = 81 Anxiety	Wait-list, alternative Civilian	Type: Computer Function: Provider therapy	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 81%	Effectiveness: Positive AE: None

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
Andersson et al., 2012 N = 204 Anxiety	Alternative Civilian	Type: Computer Function: Self-therapy	Feasibility: Unclear Acceptability: NR	Module completion: 55% Follow-up: 90%	Effectiveness: Positive AE: Yes
Andersson, Hesser, et al., 2013 N = 69 Depression	Other: Group face-to-face CBT Civilian	Type: Computer Function: Provider therapy	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 97%	Effectiveness: Positive AE: None
Andersson, Waara, et al., 2013 N = 26 Anxiety	Other: One-time exposure treatment with therapists Civilian	Type: Multiple Function: Exposure	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 88%	Effectiveness: Positive AE: NR
Andrews, Davies, and Titov, 2011 N = 37 Anxiety	Other: Face-to-face CBT Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 61%	Effectiveness: Positive AE: Yes
Areal et al., 2016 N = 626 Depression	Other: Control, application with daily health tips, alternative Civilian	Type: Smartphone Function: Self-therapy	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 23%	Effectiveness: Positive AE: NR
Au, 2015 N = 96 Depression	Alternative Civilian	Type: Phone Function: Provider feedback	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 96%	Effectiveness: Positive AE: NR
Bae and Panuncio, 2008 N = 272 Depression	Wait-list Civilian	Type: Computer Function: Self-support	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: NR	Effectiveness: Positive AE: NR
Baikie, Geerlings, and Wilhelm, 2012 N = 688 Depression	Alternative Civilian	Type: Computer Function: Self-therapy	Feasibility: Unclear Acceptability: NR	Module completion: 47% Follow-up: NR	Effectiveness: Positive AE: NR

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
Beard and Amir, 2008 N = 27 Anxiety	Alternative Civilian	Type: Computer Function: Exposure	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 100%	Effectiveness: Positive AE: NR
Bee et al., 2010 N = 53 Depression	TAU Civilian	Type: Phone Function: Provider therapy	Feasibility: No Acceptability: NR	Module completion: 73% Follow-up: 58%	Effectiveness: Unclear AE: NR
Beevers et al., 2017 N = 376 Depression	Wait-list Civilian	Type: Computer Function: Self- therapy	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 78%	Effectiveness: Positive AE: NR
Berger, Hohl, and Caspar, 2009 N = 52 Anxiety	Wait-list Civilian	Type: Computer Function: Multiple	Feasibility: Yes Acceptability: Accepted	Module completion: NR Follow-up: 90%	Effectiveness: Positive AE: NR
Berger, Boettcher, and Caspar, 2014 N = 132 Anxiety	Wait-list, alternative Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: Accepted	Module completion: 75% Follow-up: 59%	Effectiveness: Positive AE: NR
Berger, Caspar, et al., 2011 N = 76 Depression	Wait-list, alternative Civilian	Type: Computer Function: Self- therapy	Feasibility: No Acceptability: Accepted	Module completion: 36% Follow-up: 76%	Effectiveness: Positive AE: NR
Berger, Hämmerli, et al., 2011 N = 81 Anxiety	Other: Guided self-help; step-up of support on demand Civilian	Type: Computer Function: Self- therapy	Feasibility: Yes Acceptability: Accepted	Module completion: 72% Follow-up: 81%	Effectiveness: Positive AE: NR
Berger et al., 2016 N = 139 Anxiety	TAU Civilian	Type: Computer Function: Self- therapy	Feasibility: No Acceptability: Accepted	Module completion: 46% Follow-up: 63%	Effectiveness: Positive AE: NR

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
Bergström et al., 2010 N = 113 Anxiety	Other: Psychologist-led group therapy Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 81%	Effectiveness: Positive AE: NR
Birney et al., 2016 N = 300 Depression	Other: Sent links for educational websites about depression Civilian	Type: Multiple Function: Self-therapy	Feasibility: Unclear Acceptability: Accepted	Module completion: NR Follow-up: 93%	Effectiveness: Positive AE: None
Blackwell et al., 2015 N = 150 Depression	Other: Sham imagery-based cognitive bias modification Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: Accepted	Module completion: NR Follow-up: 82%	Effectiveness: Positive AE: NR
Boeschoten et al., 2016 N = 171 Depression	Wait-list Civilian	Type: Computer Function: Multiple	Feasibility: Yes Acceptability: Accepted	Module completion: NR Follow-up: 75%	Effectiveness: Positive AE: Yes
Boettcher, Berger, and Renneberg, 2012 N = 68 Anxiety	Alternative Civilian	Type: Computer Function: Other	Feasibility: Unclear Acceptability: NR	Module completion: NR Follow-up: 70%	Effectiveness: Positive AE: NR
Boettcher et al., 2013 N = 129 Anxiety	Alternative Civilian	Type: Computer Function: Self-therapy	Feasibility: No Acceptability: Accepted	Module completion: NR Follow-up: 64%	Effectiveness: Positive AE: NR
Boettcher, Aström, et al., 2014 N = 91 Anxiety	Alternative Civilian	Type: Computer Function: Self-therapy	Feasibility: No Acceptability: Accepted	Module completion: NR Follow-up: 78%	Effectiveness: Positive AE: NR
Boettcher, Hasselrot, et al., 2014 N = 133 Anxiety	Other: Sham applied attention training and individual CBT Civilian	Type: Computer Function: Self-therapy	Feasibility: No Acceptability: Accepted	Module completion: NR Follow-up: 100%	Effectiveness: Positive AE: NR

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
Bombardier et al., 2013 N = 92 Depression	Wait-list Civilian	Type: Phone Function: Provider therapy	Feasibility: Unclear Acceptability: NR	Module completion: NR Follow-up: 82%	Effectiveness: Positive AE: Yes
Bornas, Tortella-Feliu, and Llabrés, 2006 N = 41 Anxiety	Other: Multicomponent nonexposure Civilian	Type: Computer Function: Exposure	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 65%	Effectiveness: Positive AE: NR
Botella et al., 2010 N = 127 Anxiety	Wait-list, other: Face-to- face treatment Civilian	Type: Computer Function: Self- therapy	Feasibility: Unclear Acceptability: Accepted	Module completion: NR Follow-up: 32%	Effectiveness: Positive AE: NR
Botella et al., 2016 N = 69 Depression	Alternative, no treatment Civilian	Type: Computer Function: Self- therapy	Feasibility: No Acceptability: Accepted	Module completion: NR Follow-up: 95%	Effectiveness: Positive AE: NR
Bouchard et al., 2004 N = 21 Anxiety	Wait-list Civilian	Type: Videoconference Function: Provider therapy	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: NR%	Effectiveness: Positive AE: NR
Brabyn et al., 2016 N = 369 Depression	Alternative Civilian	Type: Computer Function: Self- therapy	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 73%	Effectiveness: Positive AE: Yes
Brenes et al., 2015 N = 141 Anxiety	Other: Nondirective supportive therapy Civilian	Type: Phone Function: Provider therapy	Feasibility: Unclear Acceptability: Accepted	Module completion: 75% Follow-up: 93%	Effectiveness: Positive AE: Yes
Buntrock et al., 2015 N = 406 Depression	Alternative Civilian	Type: Multiple Function: Multiple	Feasibility: No Acceptability: Accepted	Module completion: 68% Follow-up: 75%	Effectiveness: Positive AE: NR

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
Burton et al., 2016 N = 28 Depression	TAU civilian	Type: Computer Function: Self-therapy	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 86%	Effectiveness: Positive AE: NR
Calkins et al., 2015 N = 56 Depression	Alternative Civilian	Type: Computer Function: Self-therapy	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 92%	Effectiveness: Positive AE: NR
Carlbring, Ekselius, and Andersson, 2003 N = 22 Anxiety	Alternative Civilian	Type: Computer Function: Other	Feasibility: No Acceptability: NR	Module completion: 56% Follow-up: 72%	Effectiveness: Positive AE: NR
Carlbring et al., 2001 N = 41 Anxiety	Wait-list Civilian	Type: Computer Function: Self-therapy	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: NR%	Effectiveness: Positive AE: NR
Carlbring et al., 2005 N = 49 Anxiety	Other: In-person psychotherapy Civilian	Type: Computer Function: Multiple	Feasibility: Unclear Acceptability: Accepted	Module completion: 28% Follow-up: 88%	Effectiveness: Positive AE: NR
Carlbring et al., 2006 N = 60 Anxiety	Wait-list Civilian	Type: Multiple Function: Multiple	Feasibility: No Acceptability: Accepted	Module completion: 80% Follow-up: 87%	Effectiveness: Positive AE: NR
Carlbring et al., 2007 N = 60 Anxiety	Wait-list Civilian	Type: Multiple Function: Multiple	Feasibility: No Acceptability: NR	Module completion: 93% Follow-up: 93%	Effectiveness: Positive AE: NR
Carlbring et al., 2011 N = 54 Anxiety	Alternative Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 93%	Effectiveness: Positive AE: NR

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
Carlbring et al., 2012 N = 79 Anxiety	Other: Placebo, similar but not attention-bias modification (ABM) Civilian	Type: Multiple Function: Multiple	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 93%	Effectiveness: No change AE: NR
Carlbring et al., 2013 N = 80 Depression	Wait-list Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: NR	Module completion: 28% Follow-up: 93%	Effectiveness: Positive AE: NR
Carleton et al., 2016 N = 113 Anxiety	Alternative Civilian	Type: Computer Function: Multiple	Feasibility: Yes Acceptability: NR	Module completion: NR Follow-up: 36%	Effectiveness: Positive AE: NR
Choi et al., 2012 N=63 Depression	Waitlist Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: Accepted	Module completion: 53% Follow-up: 66%	Effectiveness: positive AE: NR
Choi, Hegel, et al., 2014 N = 158 Depression	Other: In-person psychological skills training (PST) Civilian	Type: Computer Function: Provider therapy	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: NR	Effectiveness: Positive AE: NR
Choi, Marti, et al., 2014 N = 121 Depression	Other: In-person PST, alternative Civilian	Type: Videoconference Function: Provider therapy	Feasibility: Yes Acceptability: Accepted	Module completion: NR Follow-up: NR	Effectiveness: Positive AE: NR
Chong and Moreno, 2012 N = 167 Depression	TAU Civilian	Type: Computer Function: Other	Feasibility: No Acceptability: Accepted	Module completion: NR Follow-up: NR	Effectiveness: Positive AE: NR
Christensen, Griffiths, and Jorm, 2004 N = 525 Depression	Other: Interviewer contact, alternative Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 82%	Effectiveness: Positive AE: NR
Christensen et al., 2006 N = 2,794 Depression	Alternative Civilian	Type: Computer Function: Self- therapy	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: NR	Effectiveness: No change AE: NR

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
Clarke et al., 2002 N = 299 Depression	TAU Civilian	Type: Computer Function: Self-therapy	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: NR	Effectiveness: No change AE: NR
Clarke et al., 2005 N = 255 Depression	TAU, alternative Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 54%	Effectiveness: Positive AE: NR
Clarke et al., 2009 N = 160 Depression	TAU Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 64%	Effectiveness: Positive AE: NR
Dagöo, 2014 N = 52 Anxiety	Alternative Civilian	Type: Multiple Function: Multiple	Feasibility: No Acceptability: NR	Module completion: 52% Follow-up: 76%	Effectiveness: Positive AE: NR
Dahlin et al., 2016 N = 103 Anxiety	Wait-list Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: Accepted	Module completion: 76% Follow-up: 63%	Effectiveness: Positive AE: NR
Day, McGrath, and Wojtowicz, 2013 N = 66 Both depression and anxiety	Wait-list Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: Accepted	Module completion: 61% Follow-up: 52%	Effectiveness: Positive AE: NR
de Graaf et al., 2011 N = 303 Depression	TAU, other: CCBT + TAU Civilian	Type: Computer Function: Self-therapy	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 88%	Effectiveness: Positive AE: NR
Dean et al., 2016 N = 1192 Both depression and anxiety	Alternative Civilian	Type: Computer Function: Self-support	Feasibility: Unclear Acceptability: Not accepted	Module completion: NR Follow-up: 13%	Effectiveness: Positive AE: NR
Dear, Potts, and Barker, 2015	Wait-list Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: Accepted	Module completion: NR Follow-up: 87%	Effectiveness: Positive AE: NR

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
N = 72 Anxiety					
Dennis, 2003 N = 42 Depression	TAU Civilian	Type: Phone Function: Self-support	Feasibility: No Acceptability: Accepted	Module completion: NR Follow-up: 100%	Effectiveness: Positive AE: NR
Donker et al., 2013 N = 1929 Depression	Other: Face-to-face CBT, and interpersonal therapy (IPT) Civilian	Type: Computer Function: Self-therapy	Feasibility: Unclear Acceptability: NR	Module completion: 11% Follow-up: 14%	Effectiveness: Positive AE: NR
Donkin et al., 2013 N = 562 Depression	Other: Unclear Civilian	Type: Computer Function: Self-therapy	Feasibility: Unclear Acceptability: NR	Module completion: NR Follow-up: 76%	Effectiveness: Positive AE: NR
Dwight-Johnson et al., 2011 N = 101 Depression	Other: Enhanced usual care Civilian	Type: Phone Function: Provider therapy	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 84%	Effectiveness: Positive AE: NR
Ebert et al., 2014 N = 150 Depression	Wait-list Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: NR	Module completion: 60% Follow-up: 81%	Effectiveness: Positive AE: NR
Egede et al., 2015 N = 241 Depression	Other: In-person behavioral activation therapy Military	Type: Other Function: Provider therapy	Feasibility: Unclear Acceptability: NR	Module completion: NR Follow-up: 83%	Effectiveness: Positive AE: None
Eisendorfer et al., 2003 N = 225 Depression	Other: Family therapy, minimal support Civilian	Type: Other Function: Provider therapy	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 100%	Effectiveness: Positive AE: NR
Enock, Hofmann, and McNally, 2014 N = 429 Anxiety	Alternative Civilian	Type: Smartphone Function: Self-therapy	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 58%	Effectiveness: Positive AE: NR

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
Farrer et al., 2011 N = 155 Depression	Alternative, no treatment Civilian	Type: Computer Function: Self-therapy	Feasibility: No Acceptability: NR	Module completion: 16% Follow-up: 61%	Effectiveness: Positive AE: NR
Fischer et al., 2015 N = 90 Depression	Wait-list Civilian	Type: Computer Function: Self-therapy	Feasibility: No Acceptability: Accepted	Module completion: NR Follow-up: 78%	Effectiveness: Positive AE: Yes
Fledderus et al., 2012 N = 376 Depression	Wait-list, alternative Civilian	Type: Computer Function: Provider support	Feasibility: No Acceptability: NR	Module completion: 78% Follow-up: 79%	Effectiveness: Positive AE: NR
Fogliati et al., 2016 N = 155 Transdiagnostic	Alternative Civilian	Type: Computer Function: Self-therapy	Feasibility: Yes Acceptability: Accepted	Module completion: 68% Follow-up: 76%	Effectiveness: Positive AE: NR
Fortney et al., 2007 N = 395 Depression	TAU Military	Type: Multiple Function: Other	Feasibility: No Acceptability: Accepted	Module completion: NR Follow-up: 77%	Effectiveness: Positive AE: NR
Fortney et al., 2013 N = 364 Depression	Other: Practice-based collaborative care Civilian	Type: Multiple Function: Other	Feasibility: No Acceptability: Accepted	Module completion: NR Follow-up: 82%	Effectiveness: Positive AE: NR
Fritsch et al., 2007 N = 345 Depression	TAU Civilian	Type: Phone Function: Provider support	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 77%	Effectiveness: Positive AE: NR
Furmark et al., 2009 N = 120 Anxiety	Wait-list, other: bibliotherapy Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: NR	Module completion: 63% Follow-up: 98%	Effectiveness: Positive AE: NR
Furukawa et al., 2012 N = 118 Depression	TAU Civilian	Type: Phone Function: Provider therapy	Feasibility: Yes Acceptability: Accepted	Module completion: NR Follow-up: 91%	Effectiveness: Positive AE: None

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
Gallego et al., 2011 N = 41 Anxiety	Wait-list Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: Accepted	Module completion: NR Follow-up: 54%	Effectiveness: Positive AE: NR
Geraedts, Kleiboer, Twisk, et al., 2014 N = 231 Depression	TAU Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: NR	Module completion: 28% Follow-up: 64%	Effectiveness: Positive AE: NR
Geraedts, Kleiboer, Wiezer, et al., 2014 N = 231 Depression	TAU Civilian	Type: Computer Function: Multiple	Feasibility: Yes Acceptability: NR	Module completion: NR Follow-up: 52%	Effectiveness: Positive AE: NR
Gilbody et al., 2015 N = 691 Depression	TAU, alternative Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: NR	Module completion: 18% Follow-up: 68%	Effectiveness: No change AE: Yes
Glozier et al., 2013 N = 562 Depression	Other: Control, online educational modules Civilian	Type: Computer Function: Other	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 93%	Effectiveness: Positive AE: None
Glueckauf et al., 2012 N = 14 Depression	Other: Face-to-face CBT Civilian	Type: Phone Function: Provider therapy	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 86%	Effectiveness: Positive AE: NR
Gorini et al., 2010 N = 21 Anxiety	Wait-list, alternative Civilian	Type: Smartphone Function: Other	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: NR	Effectiveness: Positive AE: NR
Griffiths et al., 2012 N = 478 Depression	Alternative Civilian	Type: Computer Function: Self-support	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 33%	Effectiveness: No change AE: NR
Grime, 2004 N = 48	TAU Civilian	Type: Computer Function: Self-therapy	Feasibility: Unclear Acceptability: NR	Module completion: 67% Follow-up: 58%	Effectiveness: Positive AE: Yes

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
Both depression and anxiety					
Hallgren et al., 2016 N = 945 Depression	TAU, other: Exercise Civilian	Type: Computer Function: Other	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 87%	Effectiveness: Positive AE: NR
Hazen Vasey, and Schmidt, 2009 N = 24 Anxiety	Other: Sham attentional retraining therapy, sham (ARTS) Civilian	Type: Computer Function: Self-therapy	Feasibility: No Acceptability: NR	Module completion: 92% Follow-up: 92%	Effectiveness: Positive AE: NR
Hedman, Andersson, Andersson, et al., 2011 N=126 Anxiety	Other: Group CBT Civilian	Type: Computer Function: Multiple	Feasibility: Yes Acceptability: Accepted	Module completion: 30% Follow-up: 80%	Effectiveness: Positive AE: NR
Hedman, Andersson, Ljótsson, et al., 2011 N = 81 Anxiety	Alternative Civilian	Type: Computer Function: Multiple	Feasibility: Yes Acceptability: NR	Module completion: NR Follow-up: 100%	Effectiveness: Positive AE: NR
Hedman, Axelsson, et al., 2014 N = 126 Anxiety	Other: Group-based CBT Civilian	Type: Computer Function: Provider therapy	Feasibility: Yes Acceptability: NR	Module completion: NR Follow-up: NR	Effectiveness: Positive AE: NR
Hedman, El Alaoui, et al., 2014 N = 158 Anxiety	Alternative Civilian	Type: Computer Function: Provider therapy	Feasibility: Yes Acceptability: NR	Module completion: NR Follow-up: 91%	Effectiveness: Positive AE: Yes
Hedman et al., 2016 N = 132 Anxiety	Wait-list, other: Bibliotherapy, alternative Civilian	Type: Computer Function: Provider therapy	Feasibility: No Acceptability: Accepted	Module completion: NR Follow-up: 97%	Effectiveness: Positive AE: Yes
Hickie et al., 2010 N = 83	Other: Enhanced general practitioner care Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: NR	Module completion: NR% Follow-up: 72%	Effectiveness: Positive AE: NR

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
Depression					
Hilty et al., 2007a N = 94 Depression	Alternative Civilian	Type: Videoconference Function: Other	Feasibility: No Acceptability: Accepted	Module completion: N Follow-up: NR	Effectiveness: Positive AE: NR
Hilty et al., 2007b N = 94 Depression	TAU Civilian	Type: Multiple Function: Multiple	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: NR	Effectiveness: Positive AE: NR
Himelhoch et al., 2013 N = 34 Depression	Other: Face-to-face CBT Civilian	Type: Phone Function: Provider therapy	Feasibility: Yes Acceptability: Accepted	Module completion: NR Follow-up: 88%	Effectiveness: Positive AE: None
Høifødt et al., 2013 N = 106 Depression	Wait-list Civilian	Type: Computer Function: Multiple	Feasibility: Unclear Acceptability: Accepted	Module completion: NR Follow-up: 81%	Effectiveness: Positive AE: Yes
Hungerbuehler et al., 2016 N = 107 Depression	Other: Face-to-face consultations Civilian	Type: Videoconference Function: Other	Feasibility: No Acceptability: Accepted	Module completion: NR Follow-up: 94%	Effectiveness: Positive AE: NR
Hunkeler et al., 2000 N = 302 Depression	TAU, alternative Civilian	Type: Phone Function: Provider support	Feasibility: No Acceptability: Accepted	Module completion: NR Follow-up: NR	Effectiveness: Positive AE: NR
Hunkeler et al., 2012 N = 103 Depression	TAU Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: NR	Module completion: 43% Follow-up: NR	Effectiveness: Positive AE: Yes
Ivanova et al., 2016 N = 152 Anxiety	Wait-list, alternative Civilian	Type: Multiple Function: Multiple	Feasibility: No Acceptability: NR	Module completion: 40% Follow-up: 70%	Effectiveness: Unclear AE: NR
Johansson, Ekbladh, et al., 2012 N = 121	Other: Online discussion group, alternative Civilian	Type: Computer Function: Multiple	Feasibility: Unclear Acceptability: NR	Module completion: NR Follow-up: 90%	Effectiveness: Positive AE: NR

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
Depression					
Johansson, Sjöberg, et al., 2012 N = 92 Depression	Alternative Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: NR	Module completion: 78% Follow-up: 85%	Effectiveness: Positive AE: Yes
Johansson, Björkland, et al., 2013 N = 121 Depression	Alternative Civilian	Type: Computer Function: Multiple	Feasibility: Unclear Acceptability: NR	Module completion: NR Follow-up: 89%	Effectiveness: Positive AE: NR
Johansson, Lyssarides, et al., 2013 N = 100 Both depression and anxiety	Alternative Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: Accepted	Module completion: 84% Follow-up: 94%	Effectiveness: Positive AE: NR
Johnston et al., 2011 N = 139 Transdiagnostic	Wait-list, alternative Civilian	Type: Computer Function: Multiple	Feasibility: Yes Acceptability: Accepted	Module completion: 70% Follow-up: 87%	Effectiveness: Positive AE: NR
Jonas, Leuschner, and Tossmann, 2016 N = 39 Both depression and anxiety	Wait-list Civilian	Type: Computer Function: Provider therapy	Feasibility: Unclear Acceptability: NR	Module completion: NR Follow-up: 50%	Effectiveness: Positive AE: NR
Jonassaint et al., 2017 N = 704 Both depression and anxiety	TAU, alternative Civilian	Type: Computer Function: Self-therapy	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: NR	Effectiveness: Positive AE: NR
Jones, Hadjistavropoulos, and Soucy, 2016 N = 46 Anxiety	Wait-list Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 92%	Effectiveness: Positive AE: NR

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
Kafali et al., 2014 N = 257 Depression	TAU, other: Face-to-face psychotherapy Civilian	Type: Phone Function: Provider therapy	Feasibility: No Acceptability: NR	Module completion: 69% Follow-up: NR	Effectiveness: Positive AE: NR
Kahn, Collinge, and Soltysik, 2016 N = 320 Transdiagnostic	Wait-list, other: Weekend program for couples and self-directed online psychotherapy, and weekend program for couples alone Military	Type: Computer Function: Self-therapy	Feasibility: Yes Acceptability: Accepted	Module completion: NR Follow-up: 98%	Effectiveness: positive AE: NR
Kanai et al., 2011 N = 25 Anxiety	Other: Control, watched video of another's speech Civilian	Type: Other (VCR) Function: Other	Feasibility: Unclear Acceptability: NR	Module completion: NR Follow-up: 100%	Effectiveness: Positive AE: NR
Katzelnick et al., 2000 N = 407 Depression	TAU Civilian	Type: Phone Function: Other	Feasibility: Yes Acceptability: NR	Module completion: NR Follow-up: 93%	Effectiveness: Positive AE: NR
Kelders et al., 2015 N = 239 Depression	Alternative Civilian	Type: Computer Function: Self-therapy	Feasibility: No Acceptability: Accepted	Module completion: 48% Follow-up: 55%	Effectiveness: Positive AE: NR
Kenter et al., 2016 N = 269 Depression	Other: Self-help book Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: Accepted	Module completion: 13% Follow-up: 69%	Effectiveness: Positive AE: None
Kersting et al., 2011 N = 83 Depression	Wait-list Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 60%	Effectiveness: Positive AE: NR
Kessler et al., 2009 N = 297	Wait-list Civilian	Type: Computer Function: Provider therapy	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 73%	Effectiveness: Positive AE: NR

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
Depression					
Kim et al., 2011 N = 507 Depression	Other: Sent letter encouraging to seek treatment Civilian	Type: Phone Function: Provider support	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 83%	Effectiveness: No change AE: NR
Kiropoulos et al., 2008 N = 86 Anxiety	Other: Face-to-face psychotherapy Civilian	Type: Computer Function: Multiple	Feasibility: Yes Acceptability: Accepted	Module completion: NR Follow-up: 89%	Effectiveness: Positive AE: NR
Kivi et al., 2014 N = 92 Depression	TAU Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: NR	Module completion: 67% Follow-up: 44%	Effectiveness: Positive AE: Yes
Kleiboer et al., 2015 N = 537 Both depression and anxiety	Wait-list, other: 3 other groups of same treatment with varying levels of therapist support Civilian	Type: Computer Function: Self-therapy	Feasibility: Unclear Acceptability: Accepted	Module completion: NR Follow-up: NR	Effectiveness: Positive AE: NR
Klein and Richards, 2001 N = 22 Anxiety	Other: Self-monitoring Civilian	Type: Computer Function: Self-support	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: NR	Effectiveness: Positive AE: NR
Klein, Richards, and Austin, 2006 N = 55 Anxiety	Other: Information only, alternative Civilian	Type: Computer Function: Provider therapy	Feasibility: Yes Acceptability: NR	Module completion: NR Follow-up: 95%	Effectiveness: Positive AE: Yes
Klein et al., 2009 N=57 Anxiety	Alternative Civilian	Type: Computer Function: Multiple	Feasibility: Unclear Acceptability: Accepted	Module completion: NR Follow-up: 79%	Effectiveness: Positive AE: NR
Klein et al., 2016 N = 1,013 Depression	TAU Civilian	Type: Computer Function: Multiple	Feasibility: Yes Acceptability: NR	Module completion: NR Follow-up: 74%	Effectiveness: Positive AE: NR
Kok et al., 2014	Wait-list	Type: Computer	Feasibility: No	Module completion: 1%	Effectiveness: Positive

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
N = 212 Anxiety	Civilian	Function: Multiple	Acceptability: Accepted	Follow-up: 56%	AE: None
Kok et al., 2015 N = 239 Depression	TAU Civilian	Type: Smartphone Function: Multiple	Feasibility: No Acceptability: NR	Module completion: 48% Follow-up: 63%	Effectiveness: Positive AE: NR
Kolovos et al., 2016 N = 269 Depression	Other: TAU plus a self-help book Civilian	Type: Computer Function: Multiple	Feasibility: Yes Acceptability: NR	Module completion: 13% Follow-up: 43%	Effectiveness: Positive AE: NR
Kraaij et al., 2010 N = 73 Depression	Wait-list, alternative Civilian	Type: Computer Function: Self-therapy	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 52%	Effectiveness: No change AE: NR
LaFreniere and Newman, 2016 N = 52 Anxiety	Other: Control, thought log Civilian	Type: Smartphone Function: Autoreminders	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: NR	Effectiveness: Positive AE: Yes
Lamers et al., 2015 N = 174 Depression	Wait-list, alternative Civilian	Type: Computer Function: Provider therapy	Feasibility: Unclear Acceptability: NR	Module completion: NR Follow-up: 83%	Effectiveness: Positive AE: NR
Lappalainen et al., 2013 N = 24 Depression	No treatment Civilian	Type: Multiple Function: Multiple	Feasibility: No Acceptability: Accepted	Module completion: NR Follow-up: 92%	Effectiveness: Positive AE: NR
Lappalainen et al., 2014 N = 38 Depression	Other: Face-to-face ACT Civilian	Type: Computer Function: Provider therapy	Feasibility: Unclear Acceptability: Accepted	Module completion: NR Follow-up: 84%	Effectiveness: Positive AE: NR
Lappalainen et al., 2015 N = 39 Depression	Wait-list Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: Accepted	Module completion: NR Follow-up: 63%	Effectiveness: Positive AE: Yes
Lee et al., 2015	Other: Control program on computer	Type: Computer	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 72%	Effectiveness: Positive AE: NR

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
N = 50 Anxiety	Civilian	Function: Provider therapy			
Lerner et al., 2015 N = 431 Depression	TAU Civilian	Type: Phone Function: Provider therapy	Feasibility: Unclear Acceptability: NR	Module completion: NR Follow-up: 88%	Effectiveness: Positive AE: NR
Levin et al., 2016 N = 79 Transdiagnostic	Wait-list Civilian	Type: Computer Function: Selftherapy	Feasibility: No Acceptability: Accepted	Module completion: 55% Follow-up: 80%	Effectiveness: Positive AE: NR
Littlewood et al., 2015 N = 691 Depression	TAU, alternative Civilian	Type: Computer Function: Self-therapy	Feasibility: Unclear Acceptability: NR	Module completion: 2% Follow-up: 69%	Effectiveness: No change AE: None
Lokman et al., 2017 N = 329 Depression	Wait-list Civilian	Type: Computer Function: Self-therapy	Feasibility: No Acceptability: Accepted	Module completion: NR Follow-up: 41%	Effectiveness: Positive AE: NR
Lorian, Titov, and Grisham, 2012 N = 48 Anxiety	Wait-list Civilian	Type: Computer Function: Self-therapy	Feasibility: Unclear Acceptability: NR	Module completion: NR Follow-up: 84%	Effectiveness: Positive AE: NR
Ludman et al., 2007 N = 600 Depression	TAU, other: Care management Civilian	Type: Phone Function: Provider therapy	Feasibility: No Acceptability: NR	Module completion: 79% Follow-up: 82%	Effectiveness: Positive AE: None
Luxton et al., 2016 N = 121 Depression	Other: In-person treatment Military	Type: Computer Function: Provider therapy	Feasibility: Yes Acceptability: Accepted	Module completion: 65% Follow-up: 65%	Effectiveness: Positive AE: Yes
Ly et al., 2014 N = 84	Alternative Civilian	Type: Smartphone Function: Multiple	Feasibility: No Acceptability: NR	Module completion: 63% Follow-up: 78%	Effectiveness: Positive AE: NR

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
Depression					
Ly et al., 2015 N = 93 Depression	Other: Face-to-face therapy Civilian	Type: Smartphone Function: Self-therapy	Feasibility: No Acceptability: NR	Module completion: 91% Follow-up: 74%	Effectiveness: Positive AE: None
Lynch et al., 2004 N = 54 Depression	TAU, alternative Civilian	Type: Phone Function: Provider therapy	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 50%	Effectiveness: Positive AE: NR
Mackinnon, Griffiths, and Christensen, 2008 N = 182 Depression	Alternative, no treatment Civilian	Type: Computer Function: Multiple	Feasibility: Yes Acceptability: NR	Module completion: NR Follow-up: 52%	Effectiveness: Positive AE: NR
Mahoney, Tarlow, and Jones, 2003 N = 100 Both depression and anxiety	Other: Control-reference booklet on managing behavior Civilian	Type: Phone Function: Other	Feasibility: Unclear Acceptability: NR	Module completion: NR Follow-up: 80%	Effectiveness: No change AE: NR
Mall et al., 2011 N = 24 Anxiety	Wait-list Civilian	Type: Multiple Function: Multiple	Feasibility: No Acceptability: NR	Module completion: 92% Follow-up: 92%	Effectiveness: Positive AE: NR
Maples-Keller et al., 2017 N = 89 Anxiety	Alternative Civilian	Type: Other Function: Exposure	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: NR	Effectiveness: Positive AE: NR
Marasinghe et al., 2012 N = 68 Depression	Wait-list Civilian	Type: Smartphone Function: Self-therapy	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: NR	Effectiveness: Positive AE: NR
Marks et al., 2004 N = 93 Anxiety	Other: Control, self-guided relaxation by computer, and a face-to-face therapy Civilian	Type: Computer Function: Exposure	Feasibility: Unclear Acceptability: Accepted	Module completion: NR Follow-up: 51%	Effectiveness: Positive AE: NR

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
Mathiasen et al., 2016 N = 67 Anxiety	Wait-list Civilian	Type: Computer Function: Multiple	Feasibility: Yes Acceptability: NR	Module completion: 31% Follow-up: 61%	Effectiveness: No change AE: NR
Matthews, Naran, and Kirkby, 2015 N = 37 Anxiety	Wait-list, alternative Civilian	Type: Computer Function: Exposure	Feasibility: Unclear Acceptability: NR	Module completion: NR% Follow-up: 79%	Effectiveness: Positive AE: NR
Mavandadi et al., 2015 N = 1,018 Both depression and anxiety	Other: Online monitoring of symptoms without support Civilian	Type: Phone Function: Provider support	Feasibility: Unclear Acceptability: NR	Module completion: NR% Follow-up: 53%	Effectiveness: Positive AE: NR
Melnyk et al., 2015 N = 121 Both depression and anxiety	Other: Online overview of resources Civilian	Type: Computer Function: Self- therapy	Feasibility: No Acceptability: Accepted	Module completion: 73% Follow-up: NR%	Effectiveness: No change AE: NR
Meyer et al., 2009 N = 396 Depression	Wait-list Civilian	Type: Computer Function: Self- therapy	Feasibility: No Acceptability: Accepted	Module completion: NR% Follow-up: 27%	Effectiveness: Positive AE: None
Meyer et al., 2015 N=163 Depression	Wait-list, TAU Civilian	Type: Multiple Function: Multiple	Feasibility: Yes Acceptability: Accepted	Module completion: NR% Follow-up: 73%%	Effectiveness: Positive AE: NR
Migliorini et al., 2016 N = 59 Depression	Wait-list Civilian	Type: Computer Function: Multiple	Feasibility: Yes Acceptability: NR	Module completion: NR Follow-up: 68%	Effectiveness: Positive AE: NR
Milani et al., 2015 N = 54 Depression	TAU Civilian	Type: Phone Function: Self- support	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: NR	Effectiveness: Positive AE: NR
Milgrom et al., 2016	TAU	Type: Computer	Feasibility: Yes	Module completion: 86%	Effectiveness: Positive

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
N = 43 Depression	Civilian	Function: Multiple	Acceptability: Accepted	Follow-up: 90%	AE: NR
Millán-Calenti et al., 2015 N = 160 Depression	No treatment Civilian	Type: Computer Function: Self- therapy	Feasibility: Unclear Acceptability: NR	Module completion: NR Follow-up: 100%	Effectiveness: No change AE: NR
Mohr et al., 2005 N = 127 Depression	Alternative Military	Type: Phone Function: Provider therapy	Feasibility: Unclear Acceptability: NR	Module completion: 95% Follow-up: 95%	Effectiveness: Positive AE: Yes
Mohr et al., 2011 N = 85 Depression	TAU Military	Type: Phone Function: Provider therapy	Feasibility: No Acceptability: NR	Module completion: 78% Follow-up: 95%	Effectiveness: No change AE: NR
Mohr et al., 2012 N = 325 Depression	Other: Face-to-face CBT Civilian	Type: Phone Function: Provider therapy	Feasibility: No Acceptability: NR	Module completion: NR% Follow-up: 79%	Effectiveness: Positive AE: None
Mohr et al., 2013 N = 102 Depression	Wait-list, alternative Civilian	Type: Multiple Function: Multiple	Feasibility: Yes Acceptability: NR	Module completion: NR% Follow-up: 74%	Effectiveness: Positive AE: None
Montero-Marin et al., 2016 N = 296 Depression	TAU, alternative Civilian	Type: Computer Function: Self- therapy	Feasibility: No Acceptability: NR	Module completion: 31% Follow-up: 62%	Effectiveness: Positive AE: NR
Moreno et al., 2012 N = 167 Depression	TAU Civilian	Type: Videoconference Function: Provider therapy	Feasibility: Unclear Acceptability: NR	Module completion: NR% Follow-up: 86%	Effectiveness: Positive AE: NR
Morgan, Jorm, and Mackinnon, 2012 N = 1,326 Both depression and anxiety	Alternative Civilian	Type: Computer Function: Other	Feasibility: No Acceptability: NR	Module completion: NR% Follow-up: 42%	Effectiveness: Positive AE: NR
Moritz et al., 2012	Wait-list	Type: Computer	Feasibility: Yes	Module completion: NR%	Effectiveness: Positive

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
N = 210 Depression	Civilian	Function: Self-therapy	Acceptability: Accepted	Follow-up: 82%	AE: NR
Morris, Schueller, and Picard, 2015 N = 265 Depression	Alternative Civilian	Type: Computer Function: Self-support	Feasibility: No Acceptability: NR	Module completion: NR% Follow-up: 62%	Effectiveness: Positive AE: Yes
Mota Pereira, 2014 N = 60 Depression	TAU, alternative Civilian	Type: Computer Function: Provider support	Feasibility: No Acceptability: NR	Module completion: 100% Follow-up: NR%	Effectiveness: Positive AE: NR
Müller et al., 2011 N = 36 Anxiety	Other: Computer showing neutral pictures Civilian	Type: Computer Function: Exposure	Feasibility: No Acceptability: NR	Module completion: NR% Follow-up: 94%	Effectiveness: Positive AE: NR
Mullin et al., 2015 N = 55 Both depression and anxiety	Wait-list Civilian	Type: Computer Function: Multiple	Feasibility: Yes Acceptability: Accepted	Module completion: 43%% Follow-up: 60%%	Effectiveness: Positive AE: NR
Neubauer et al., 2013 N = 59 Anxiety	Alternative Civilian	Type: Computer Function: Selftherapy	Feasibility: No Acceptability: NR	Module completion: NR% Follow-up: 86%	Effectiveness: Positive AE: NR
Neugebauer et al., 2006 N = 19 Depression	TAU Civilian	Type: Phone Function: Provider therapy	Feasibility: No Acceptability: NR	Module completion: NR% Follow-up: 80%	Effectiveness: Positive AE: NR
Newby et al., 2013 N = 109 Both depression and anxiety	Wait-list Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: Accepted	Module completion: 84% Follow-up: 82%	Effectiveness: Positive AE: NR
Newby et al., 2017 N = 106	TAU Civilian	Type: Multiple Function: Multiple	Feasibility: No Acceptability: Accepted	Module completion: 55% Follow-up: 43%	Effectiveness: Positive AE: NR

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
Depression					
Ngai et al., 2015 N = 397 Depression	TAU Civilian	Type: Phone Function: Provider therapy	Feasibility: No Acceptability: NR	Module completion: 87% Follow-up: 88%	Effectiveness: Positive AE: NR
Nilsson and Lundh, 2016 N = 41 Anxiety	Alternative Civilian	Type: Other Function: Exposure	Feasibility: Unclear Acceptability: NR	Module completion: NR% Follow-up: NR%	Effectiveness: Positive AE: None
Nobis et al., 2015 N = 260 Depression	Alternative Civilian	Type: Multiple Function: Multiple	Feasibility: No Acceptability: Accepted	Module completion: 62% Follow-up: 62%	Effectiveness: Positive AE: NR
Nordgren et al., 2014 N = 100 Anxiety	Alternative Civilian	Type: Computer Function: Provider therapy	Feasibility: No Acceptability: NR	Module completion: 32% Follow-up: 90%	Effectiveness: Positive AE: NR
Nowakowski, Antony, and Koerner, 2015 N = 72 Anxiety	Alternative Civilian	Type: Computer Function: Self- therapy	Feasibility: Unclear Acceptability: NR	Module completion: NR% Follow-up: NR%	Effectiveness: No change AE: NR
Nyström et al., 2017 N = 312 Depression	Alternative Civilian	Type: Computer Function: Multiple	Feasibility: Unclear Acceptability: NR	Module completion: NR% Follow-up: 17%	Effectiveness: Positive AE: NR
O'Leary and Dockray, 2015 N = 62 Depression	Waitlist, alternative Civilian	Type: Computer Function: Self- therapy	Feasibility: No Acceptability: NR	Module completion: NR% Follow-up: NR%	Effectiveness: No change AE: NR
O'Mahen et al., 2013 N = 910 Depression	TAU Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: NR	Module completion: NR% Follow-up: 21%	Effectiveness: Positive AE: NR
O'Neil et al., 2014 N = 430	TAU Civilian	Type: Phone Function: Provider support	Feasibility: No Acceptability: NR	Module completion: NR% Follow-up: 66%	Effectiveness: Unclear AE: NR

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
Both depression and anxiety					
O'Neill et al., 2015 N = 121 Depression	TAU Civilian	Type: Phone Function: Provider therapy	Feasibility: Yes Acceptability: NR	Module completion: NR% Follow-up: 77%	Effectiveness: Positive AE: NR
Orbach, Lindsay, and Grey, 2007 N = 90 Anxiety	Other: Nonpsychotherapeutic information via computer Civilian	Type: Computer Function: Self therapy	Feasibility: No Acceptability: Accepted	Module completion: NR% Follow-up: NR%	Effectiveness: Positive AE: NR
Oromendia et al., 2016 N = 77 Anxiety	Wait-list, alternative Civilian	Type: Computer Function: Self-therapy	Feasibility: Yes Acceptability: NR	Module completion: NR% Follow-up: 67%	Effectiveness: Positive AE: NR
Orr and Moscovitch, 2010 N = 68 Anxiety	Other: Speech Without video, alternative Civilian	Type: Other (VCR) Function: Provider feedback	Feasibility: No Acceptability: NR	Module completion: NR% Follow-up: NR%	Effectiveness: Positive AE: NR
Pallavicini et al., 2009 N = 13 Anxiety	Wait-list, alternative Civilian	Type: Multiple Function: Self-therapy	Feasibility: No Acceptability: NR	Module completion: NR% Follow-up: 80%	Effectiveness: Positive AE: NR
Paxling et al., 2011 N = 89 Anxiety	Wait-list Civilian	Type: Computer Function: Provider therapy	Feasibility: No Acceptability: NR	Module completion: 11% Follow-up: 59%	Effectiveness: Positive AE: NR
Perini, Titov, and Andrews, 2009 N = 48 Depression	Wait-list Civilian	Type: Computer Function: Provider therapy	Feasibility: Yes Acceptability: Accepted	Module completion: 69% Follow-up: 62%	Effectiveness: Positive AE: NR
Pham et al., 2016 N = 63 Anxiety	Wait-list Civilian	Type: Smartphone Function: Other function	Feasibility: No Acceptability: Accepted	Module completion: NR% Follow-up: 55%	Effectiveness: Positive AE: NR

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
Phillips et al., 2014 N = 637 Both depression and anxiety	Other: Control, informational websites Civilian	Type: Computer Function: Self-therapy	Feasibility: No Acceptability: NR	Module completion: NR% Follow-up: 32%	Effectiveness: Positive AE: None
Pictet, Jermann, and Ceschi, 2016 N = 101 Depression	Wait-list, other: Control cognitive bias modification Pivilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: NR	Module completion: NR% Follow-up: 94%	Effectiveness: positive AE: NR
Piette et al., 2011 N = 339 Depression	Other: enhanced usual care, TAU and <i>Feeling Good Handbook</i> and educational materials Unclear	Type: Phone Function: Provider therapy	Feasibility: No Acceptability: NR	Module completion: NR% Follow-up: 84%	Effectiveness: Positive AE: NR
Pinto et al., 2013 N = 28 Depression	Alternative Civilian	Type: Computer Function: Other	Feasibility: No Acceptability: NR	Module completion: NR% Follow-up: NR%	Effectiveness: Positive AE: NR
Pinto et al., 2016 N = 60 Depression	No treatment Civilian	Type: Computer Function: Self-support	Feasibility: No Acceptability: Accepted	Module completion: NR% Follow-up: NR%	Effectiveness: Positive AE: None
Pots et al., 2016 N = 236 Depression	Wait-list, other: Active control/expressive writing Civilian	Type: Computer Function: Self-therapy	Feasibility: No Acceptability: NR	Module completion: 84% Follow-up: 87%	Effectiveness: Positive AE: NR
Proudfoot et al., 2003 N = 167 Both depression and anxiety	TAU Civilian	Type: Computer Function: Self-therapy	Feasibility: No Acceptability: NR	Module completion: NR% Follow-up: 54%	Effectiveness: Positive AE: Yes
Proudfoot et al., 2004 N = 274	TAU Civilian	Type: Computer Function: Self-therapy	Feasibility: No Acceptability: Accepted	Module completion: NR% Follow-up: 63%	Effectiveness: Positive AE: NR

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
Both depression and anxiety					
Proudfoot et al., 2013 N = 720 Both depression and anxiety	Wait-list, other: Educational material Civilian	Type: Multiple Function: Self-therapy	Feasibility: No Acceptability: Accepted	Module completion: NR% Follow-up: 41%	Effectiveness: Positive AE: NR
Proyer et al., 2014 N = 510 Depression	Alternative Civilian	Type: Computer Function: Self-therapy	Feasibility: No Acceptability: NR	Module completion: NR% Follow-up: 29%	Effectiveness: Positive AE: NR
Pugh, Hadjistavropoulos, and Dirkse, 2016 N = 50 Depression	Wait-list Civilian	Type: Computer Function: Provider therapy	Feasibility: No Acceptability: Accepted	Module completion: 60% Follow-up: 80%	Effectiveness: Positive AE: NR
Pyne et al., 2010 N = 430 Depression	TAU Military	Type: Phone Function: Provider support	Feasibility: No Acceptability: NR	Module completion: NR% Follow-up: 77%	Effectiveness: No change AE: NR
Richards, Timulak, and Hevey, 2013 N = 101 Depression	Alternative Civilian	Type: Computer Function: Provider therapy	Feasibility: No Acceptability: NR	Module completion: 10% Follow-up: 36%	Effectiveness: Positive AE: NR
Richards et al., 2015 N = 262 Depression	Wait-list Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: NR	Module completion: 27% Follow-up: 22%	Effectiveness: Positive AE: NR
Richards et al., 2016 N = 137 Anxiety	Wait-list Civilian	Type: Computer Function: Multiple	Feasibility: Yes Acceptability: NR	Module completion: 25% Follow-up: 84%	Effectiveness: Positive AE: NR
Rickhi et al., 2015 N = 32 Depression	Wait-list Civilian	Type: Computer Function: Self-therapy	Feasibility: No Acceptability: NR	Module completion: NR% Follow-up: 94%	Effectiveness: Positive AE: NR
Rickles et al., 2005	TAU	Type: Phone	Feasibility: No	Module completion: 90%	Effectiveness: Positive

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
N = 63 Depression	Civilian	Function: Provider support	Acceptability: NR	Follow-up: 90%	AE: NR
Robinson et al., 2010 N = 150 Anxiety	Wait-list, alternative Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: Accepted	Module completion: 80% Follow-up: 90%	Effectiveness: Positive AE: NR
Roepke et al., 2015 N = 283 Depression	Wait-list, alternative Civilian	Type: Smartphone Function: Self-therapy	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 12%	Effectiveness: Positive AE: NR
Rollman et al., 2009 N = 302 Depression	TAU Civilian	Type: Phone Function: Provider support	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 84%	Effectiveness: Positive AE: None
Romero-Sanchiz et al., 2017 N = 296 Depression	TAU, alternative Civilian	Type: Computer Function: Self-therapy	Feasibility: Yes Acceptability: NR	Module completion: NR Follow-up: 62%	Effectiveness: Positive AE: NR
Rosmarin et al., 2010 N = 261 Anxiety	Wait-list, alternative Civilian	Type: Computer Function: Self-therapy	Feasibility: No Acceptability: Accepted	Module completion: 78% Follow-up: 34%	Effectiveness: Positive AE: None
Rosso et al., 2017 N = 77 Depression	Other: Control, monitored attention control Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: NR	Module completion: 92% Follow-up: 81%	Effectiveness: Positive AE: NR
Ruskin et al., 2004 N = 131 Depression	Other: In-person treatment Military	Type: Phone Function: Multiple	Feasibility: Yes Acceptability: Accepted	Module completion: NR Follow-up: NR	Effectiveness: Positive AE: NR
Ruwaard et al., 2009 N = 54 Depression	Wait-list Civilian	Type: Computer Function: Provider therapy	Feasibility: No Acceptability: Accepted	Module completion: NR Follow-up: 75%	Effectiveness: Positive AE: NR
Ruwaard et al., 2010	Wait-list	Type: Computer	Feasibility: Yes	Module completion: NR	Effectiveness: Positive

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
N = 58 Anxiety	Civilian	Function: Provider therapy	Acceptability: Accepted	Follow-up: 89%	AE: NR
Salisbury et al., 2016 N = 609 Depression	TAU Civilian	Type: Phone Function: Provider support	Feasibility: Unclear Acceptability: Accepted	Module completion: 28% Follow-up: 83%	Effectiveness: Positive AE: Yes
Sandoval et al., 2016 N = 45 Depression	No treatment Civilian	Type: Computer Function: Self-therapy	Feasibility: No Acceptability: Accepted	Module completion: NR Follow-up: 100%	Effectiveness: Positive AE: Yes
Schneider et al., 2005 N = 68 Anxiety	Alternative Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: Accepted	Module completion: NR Follow-up: 69%	Effectiveness: Positive AE: NR
Schröder, Jelinek, and Moritz, 2017 N = 180 Anxiety	Wait-list Civilian	Type: Multiple Function: Multiple	Feasibility: No Acceptability: Accepted	Module completion: NR Follow-up: 68%	Effectiveness: Positive AE: NR
Schulz et al., 2016 N = 149 Anxiety	Wait-list, alternative Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: Accepted	Module completion: NR Follow-up: 53%	Effectiveness: Positive AE: Yes
Selmi et al., 1991 N = 36 Depression	Wait-list, TAU Civilian	Type: Computer Function: Self-therapy	Feasibility: No Acceptability: NR	Module completion: 100% Follow-up: 100%	Effectiveness: Positive AE: NR
Sethi, 2013 N = 89 Both depression and anxiety	Other: Face-to-face CBT, no treatment Civilian	Type: Computer Function: Self-therapy	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 100%	Effectiveness: Positive AE: NR
Sheeber et al., 2012 N = 70 Depression	TAU Civilian	Type: Computer Function: Multiple	Feasibility: Unclear Acceptability: Accepted	Module completion: NR Follow-up: 94%	Effectiveness: Positive AE: NR

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
Silfvernagel et al., 2012 N = 57 Anxiety	Wait-list Civilian	Type: Computer Function: Provider therapy	Feasibility: No Acceptability: NR	Module completion: 24% Follow-up: 69%	Effectiveness: Positive AE: NR
Simon et al., 2004 N = 600 Depression	TAU, alternative Civilian	Type: Phone Function: Multiple	Feasibility: No Acceptability: Accepted	Module completion: NR Follow-up: 96%	Effectiveness: Positive AE: NR
Simon, Ludman, and Operskalski, 2006 N = 207 Depression	TAU Civilian	Type: Phone Function: Multiple	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 91%	Effectiveness: No change AE: NR
Simon et al., 2011 N = 208 Depression	TAU Civilian	Type: Computer Function: Provider support	Feasibility: No Acceptability: Accepted	Module completion: NR Follow-up: 98%	Effectiveness: Positive AE: NR
Spek et al., 2007 N = 301 Depression	Wait-list, other: Group therapy Civilian	Type: Computer Function: Self- therapy	Feasibility: No Acceptability: NR	Module completion: 48% Follow-up: 66%	Effectiveness: Positive AE: NR
Steffen and Gant, 2015 N = 74 Depression	Alternative Civilian	Type: Multiple Function: Multiple	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 85%	Effectiveness: Positive AE: NR
Stein et al., 2007 N = 177 Depression	No treatment Civilian	Type: Phone Function: Self- support	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 90%	Effectiveness: No change AE: NR
Stetz et al., 2011 N = 60 Anxiety	No treatment Military	Type: Other Function: Other	Feasibility: No Acceptability: Accepted	Module completion: NR Follow-up: NR%	Effectiveness: Positive AE: NR
Stiles-Shields et al., 2014 N = 325 Depression	Other: Face-to-face CBT Civilian	Type: Phone Function: Provider therapy	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 91%	Effectiveness: Positive AE: NR

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
Ström et al., 2013 N = 48 Depression	Wait-list Civilian	Type: Computer Function: Other	Feasibility: No Acceptability: NR	Module completion: 58% Follow-up: 88%	Effectiveness: Positive AE: NR
Stubbings et al., 2013 N = 26 Both depression and anxiety	Other: Face-to-face CBT Civilian	Type: Computer Function: Provider therapy	Feasibility: No Acceptability: Accepted	Module completion: 79% Follow-up: 64%	Effectiveness: Positive AE: NR
Taleban et al., 2016 N = 203 Depression	Other: Booklet only, no treatment Civilian	Type: Smartphone Function: Autoreminders	Feasibility: No Acceptability: NR	Module completion: NR Follow-up: 99%	Effectiveness: Positive AE: NR
Tillfors et al., 2008 N = 38 Anxiety	Alternative Civilian	Type: Computer Function: Self-therapy	Feasibility: Yes Acceptability: Accepted	Module completion: 63% Follow-up: 84%	Effectiveness: Positive AE: NR
Titov, Andrews, Schwencke, et al., 2008 N = 105 Anxiety	Wait-list Civilian	Type: Computer Function: Multiple	Feasibility: No Acceptability: Accepted	Module completion: 78% Follow-up: 88%	Effectiveness: Positive AE: NR
Titov, Andrews, and Schwencke, 2008 N = 88 Anxiety	Wait-list Civilian	Type: Computer Function: Multiple	Feasibility: Yes Acceptability: Accepted	Module completion: 77% Follow-up: 88%	Effectiveness: Positive AE: NR
Titov, Andrews, Choi, et al., 2008 N = 98 Anxiety	Wait-list, alternative Civilian	Type: Computer Function: Provider therapy	Feasibility: No Acceptability: Accepted	Module completion: 75% Follow-up: 94%	Effectiveness: Positive AE: NR
Titov et al., 2009 N = 48 Anxiety	Wait-list Civilian	Type: Computer Function: Provider therapy	Feasibility: No Acceptability: Accepted	Module completion: 72% Follow-up: 80%	Effectiveness: Positive AE: NR
Titov, Andrews, Schwencke, et al., 2010	Alternative Civilian	Type: Computer	Feasibility: Yes	Module completion: 56% Follow-up: 84%	Effectiveness: Positive AE: NR

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
N = 113 Anxiety		Function: Self-therapy	Acceptability: Accepted		
Titov, Andrews, Johnston et al., 2010 N = 86 Anxiety	Wait-list Civilian	Type: Computer Function: Multiple	Feasibility: Unclear Acceptability: Accepted	Module completion: 71% Follow-up: 76%	Effectiveness: Positive AE: NR
Titov, Andrews, Davies, et al., 2010 N = 141 Depression	Wait-list, alternative Civilian	Type: Computer Function: Provider therapy	Feasibility: Unclear Acceptability: Accepted	Module completion: 70% Follow-up: 64%	Effectiveness: Positive AE: NR
Titov et al., 2011 N = 77 Both depression and anxiety	Wait-list Civilian	Type: Computer Function: Provider therapy	Feasibility: No Acceptability: Accepted	Module completion: 81% Follow-up: 82%	Effectiveness: Positive AE: None
Titov et al., 2014 N = 257 Both depression and anxiety	Wait-list, alternative Civilian	Type: Computer Function: Multiple	Feasibility: Yes Acceptability: NR	Module completion: 68% Follow-up: 81%	Effectiveness: Positive AE: NR
Titov, Dear, Ali, et al., 2015 N = 290 Depression	Alternative Civilian	Type: Computer Function: Provider therapy	Feasibility: No Acceptability: Accepted	Module completion: 61% Follow-up: 79%	Effectiveness: Positive AE: NR
Titov, Dear, Staples, et al., 2015 N = 54 Depression	Wait-list Civilian	Type: Computer Function: Provider therapy	Feasibility: No Acceptability: Accepted	Module completion: 70% Follow-up: 70%	Effectiveness: Positive AE: NR
Titov et al., 2016 N = 459 Both depression and anxiety	Alternative Civilian	Type: Computer Function: Provider therapy	Feasibility: Yes Acceptability: Accepted	Module completion: 92% Follow-up: 96%	Effectiveness: Positive AE: NR

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
Tortella-Feliu et al., 2011 N = 60 Anxiety	TAU, other: Computer- aided exposure with therapist Civilian	Type: Computer Function: Exposure	Feasibility: No Acceptability: Not accepted	Module completion: NR Follow-up: NR	Effectiveness: Positive AE: NR
Tulbure et al., 2015 N = 76 Anxiety	Wait-list Civilian	Type: Computer Function: Self- therapy	Feasibility: No Acceptability: Accepted	Module completion: 39% Follow-up: 87%	Effectiveness: Positive AE: NR
Uebelacker et al., 2011 N = 38 Depression	TAU Civilian	Type: Phone Function: Provider support	Feasibility: No Acceptability: Accepted	Module completion: NR% Follow-up: NR%	Effectiveness: Positive AE: NR
Ünlü et al., 2013 N = 96 Depression	Wait-list Civilian	Type: Computer Function: Self- therapy	Feasibility: No Acceptability: Accepted	Module completion: 20% Follow-up: 27%	Effectiveness: No change AE: NR
Van Ballegooijen et al., 2013 N = 126 Anxiety	Wait-list Civilian	Type: Computer Function: Self- therapy	Feasibility: Unclear Acceptability: NR	Module completion: 8% Follow-up: 54%	Effectiveness: No change AE: Yes
Van Bastelaar et al., 2011 N = 255 Depression	Wait-list Civilian	Type: Computer Function: Multiple	Feasibility: Unclear Acceptability: NR	Module completion: 42% Follow-up: 58%	Effectiveness: Positive AE: NR
Van den Berg et al., 2015 N = 123 Transdiagnostic	TAU, other: Telephone + text + usual care Civilian	Type: Phone Function: Provider support	Feasibility: Unclear Acceptability: NR	Module completion: NR% Follow-up: 98%	Effectiveness: Positive AE: NR
Van Straten, Cuijpers, and Smits, 2008 N = 213 Both depression and anxiety	Wait-list Civilian	Type: Computer Function: Self- therapy	Feasibility: No Acceptability: NR	Module completion: 55% Follow-up: 76%	Effectiveness: Positive AE: NR

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
Vernmark et al., 2010 N = 88 Depression	Wait-list, alternative Civilian	Type: Computer Function: Provider therapy	Feasibility: No Acceptability: NR	Module completion: NR% Follow-up: 83%	Effectiveness: Positive AE: NR
Wagner, Horn, and Maercker, 2014 N = 62 Depression	TAU, other: Face-to-face psychotherapy Civilian	Type: Computer Function: Provider therapy	Feasibility: Unclear Acceptability: Accepted	Module completion: 78% Follow-up: 53%	Effectiveness: Positive AE: NR
Warmerdam et al., 2008 N = 263 Depression	Wait-list, alternative Civilian	Type: Computer Function: Self- therapy	Feasibility: No Acceptability: NR	Module completion: 39% Follow-up: 52%	Effectiveness: Positive AE: NR
Watkins et al., 2012 N = 121 Depression	TAU, alternative Civilian	Type: Phone Function: Multiple	Feasibility: No Acceptability: NR	Module completion: 70% Follow-up: 75%	Effectiveness: Positive AE: None
Watts et al., 2013 N = 52 Depression	Alternative Civilian	Type: Smartphone Function: Self- therapy	Feasibility: No Acceptability: Accepted	Module completion: 45% Follow-up: 41%	Effectiveness: Positive AE: NR
Williams et al., 2013 N = 69 Depression	Wait-list Civilian	Type: Computer Function: Self- therapy	Feasibility: No Acceptability: Accepted	Module completion: 50% Follow-up: 53%	Effectiveness: Positive AE: NR
Williams et al., 2015 N = 121 Depression	Other: iCBT+ sham CBM Civilian	Type: Computer Function: Self- therapy	Feasibility: Unclear Acceptability: Accepted	Module completion: NR% Follow-up: 55%	Effectiveness: No change AE: NR
Wims et al., 2010 N = 59 Anxiety	Wait-list Civilian	Type: Computer Function: Provider therapy	Feasibility: No Acceptability: NR	Module completion: 72% Follow-up: 66%	Effectiveness: Positive AE: NR
Wolitzky-Taylor and Telch, 2010 N = 113 Anxiety	Wait-list, other: Expressive writing and audiophotic stimulation Civilian	Type: Other Function: Exposure	Feasibility: No Acceptability: NR	Module completion: NR% Follow-up: 61%	Effectiveness: Positive AE: NR

Identification N Diagnosis	Comparator Population	Technology Type Technology Function	Feasibility Test Acceptability	Module Completion Follow-up Completion	Effectiveness Signal Adverse Events (AE) Data
Wozney et al., 2017 N = 62 Depression	TAU Civilian	Type: Multiple Function: Multiple	Feasibility: No Acceptability: Accepted	Module completion: NR% Follow-up: 81%	Effectiveness: Positive AE: NR
Yang et al., 2015 N = 77 Depression	Other: Placebo computer task, no treatment Civilian	Type: Computer Function: Other	Feasibility: No Acceptability: NR	Module completion: 100% Follow-up: 85%	Effectiveness: Positive AE: NR
Zetterqvist et al., 2003 N = 100 Both depression and anxiety	Wait-list Civilian	Type: Computer Function: Self-therapy	Feasibility: Yes Acceptability: NR	Module completion: 12% Follow-up: 23%	Effectiveness: Negative AE: None

NOTE: N = number of participants.

Table A.2. Upcoming Research

Trial ID	Year	Affiliation	Title
NCT01975207	2016	A. H. S. Cancer Control Alberta Addiction and Mental Health Strategic Clinical Network	"Comparison Study of Family Practice Interventions for Depression in Adults"
NCT01488058	2012	Alishia Williams, University of New South Wales and St Vincent's Hospital Sydney	"Using a Smartphone App to Reduce Cognitive Vulnerability and Mild Depressive Symptoms"
NCT02783118	2017	Babes-Bolyai University	"Reducing Depressive Symptomatology with a Smartphone App"
NCT03060200	2017	Babes-Bolyai University, Norwegian University of Science Technology and CheckWare A. S.	"Web-Based Collaborative Care for Patients with Diabetes and Depression"
NCT01985711	2016	Beijing Anzhen Hospital and Chinese P. L. A. General Hospital	"Developing a Low-Intensity Primary Care Intervention for Anxiety Disorders (AIM-PC)"
NCT02579915	2017	Brown University, McLean Hospital, Memorial Hospital of Rhode Island and National Institute of Mental Health	"Developing a Low-Intensity Primary Care Intervention for Anxiety Disorders"
NCT02266446	2017	Brown University, National Institute of Mental Health, Memorial Hospital of Rhode Island and McLean Hospital	"Transdiagnostic iCBT for Depression and Anxiety"
NCT02266693	2017	Centre for Addiction Mental Health	"Social Media Intervention for Postpartum Depression"
NCT02355067	2017	Children's Hospital of Philadelphia, The Oscar G. Elsa S. Mayer Family Foundation and University of Pennsylvania	"Efficacy of CES in New Mothers During the Post-Partum Period"
NCT03210155	2019	Christina Murphey, R. N. P.	"Website-Based Self-Help for Women with Anxiety After Childbirth"
NCT02434406	2017	City University of London and Monash University	"Depression Screening in Primary Care: Using HIT for Patients with Limited English"
NCT02421965	2017	Dartmouth-Hitchcock Medical Center and Patient-Centered Outcomes Research Institute	"Comparing Mobile Health (mHealth) and Clinic-Based Self-Management Interventions for Serious Mental Illness"
NCT03062267	2019	Dartmouth-Hitchcock Medical Center and University of Washington	"Effectiveness of a Mobile Texting Intervention for People with Serious Mental Illness"
NCT03062202	2017	Derek, R., Silver Cloud, H. and University of Dublin, T. C.	"Pillars4Life Trial"
NCT02614443	2017	Derek, R., Silver Cloud, H. and University of Dublin, T. C.	"Effects of Online Cognitive Control Training on Rumination and Depressive Symptoms"
NCT02465892	2016	Duke University and Pfizer	"Evaluating a Novel Internet Intervention for Persons with Epilepsy and Depression"
NCT03011216	2019	Freie Universität Berlin and University Ghent	"Modeling and Predicting Real World Behavior Using Mobile Sensor Data on Patients with Major Depressive Disorder"
NCT02791724	2017	Gaia, A. G. and Universitätsklinikum Hamburg-Eppendorf	"Telemedicine for Depression in Primary Care"
NCT02499094	2015	Ginger.io	"Thrive Care: Internet CBT for Depression"
NCT02542891	2017	Institut National de la Santé Et de la Recherche Médicale, F., European, C., Fondation, F. and Assistance Publique - Hôpitaux de, P.	"eCare for Moods: An Internet-Based Management Program"
NCT01701791	2016	Irccs Centro San Giovanni di Dio Fatebenefratelli	"MoodHelper: Internet Cognitive Behavioral Therapy (CBT) for Depression"
NCT02196896	2016	Johannes Gutenberg University Mainz and Rhön-Klinikum A. G.	"Booster as an Adjunct to Internet-Based Cognitive Behavior Therapy (CBT)"

Trial ID	Year	Affiliation	Title
NCT03079895	2017	Kaiser Permanente	"ICBT for Antenatal Depression"
NCT00485420	2009	Kaiser Permanente and Eli Lilly Company	"Internet-Based Exposure Therapy for Panic Disorder"
NCT01379027	2016	Kaiser Permanente and Oregon Health Science University	"Internet-CBT (Cognitive Behavioral Therapy) for Depression and Anxiety in Parkinsons Disease"
NCT01525576	2012	Karolinska Institutet	"Smartphone Intervention for Subthreshold Depression"
NCT02366429	2016	Karolinska Institutet	"Tailored Internet-Delivered Cognitive Behaviour Therapy in Primary Care"
NCT03061448	2017	Karolinska Institutet	"Internet-Delivered Psychodynamic Therapy for Depression and Anxiety Disorders"
NCT01545414	2013	Karolinska Institutet and Stockholm County Council Sweden	"Internet-Administrated Treatment of Anxiety Symptoms for Young Adults"
NCT03110016	2017	Kibi International University	"Internet-Delivered Cognitive Behaviour Therapy for Older Adults with Anxiety"
NCT01205191	2012	Linköping University	"Internet-Delivered Psychodynamic Therapy for Social Anxiety Disorder (SOFIA)"
NCT02449447	2017	Linköping University and European Commission	"Psychodynamic Internet Treatment Versus Cognitive Behavioral Therapy (CBT) for Generalized Anxiety Disorder"
NCT01591720	2011	Linköping University	"Sinaspriate: A Pilot Feasibility Study for Patients with Anxiety or Stress"
NCT01532219	2012	Linköping University	"Effect of a Self-Care Intervention on Depression in People with Age-Related Macular Degeneration or Diabetic Retinopathy"
NCT01402258	2014	Linköping University	"Online Yoga for Individuals with Mood Disorders"
NCT02403557	2015	Linköping University	"Effectiveness of a Self-Care Intervention for Depression in Primary Care Patients with Chronic Physical Illnesses"
NCT02105259	2014	Linköping University, Karolinska Institutet and Stockholm University	"Using Smart Phone Technology to Rural Veterans"
NCT01312116	2009	Linköping University and Stockholm University	"Internet-Delivered Psycho-Oncological Support"
NCT02955784	2017	Madigan Army Medical Center	"Mobile Technology to Engage and Link Patients and Providers in Antidepressant Treatment (MedLink)"
NCT02261194	2016	Maisonnette-Rosemont Hospital, Fonds de la Recherche en Santé du Québec and Fondation Antoine Turmel	"Online Peer Networked Collaborative Learning for Managing Depressive Symptoms"
NCT02610725	2018	Massachusetts General Hospital and Brown University	"Mobile Technology to Engage and Link Patients and Providers in Antidepressant Treatment"
NCT01521013	2014	McGill University and Fonds de la Recherche en Santé du Québec	"IntelliCare Study: Artificial Intelligence in a Mobile (AIM) Intervention for Depression"
NCT01346228	2013	Michael DeBakey Veterans Affairs Medical Center and South Central VA Mental Illness Research Education Clinical Center	"Stepped Telemental Health Care Intervention for Depression"
NCT02670200	2016	Neuropsychiatrischen Zentrums Hamburg-Altona and University of Hamburg	"Feedback to Improve Depression Outcomes"
NCT02583230	2015	Northwestern University	"Pilot Study Assessing Computerized Cognitive Behavioral Therapy for Depression"
NCT01912664	2016	Northwestern University	"Computerized Cognitive Behavior Therapy in Treating Depression in Patients with Cancer"

Trial ID	Year	Affiliation	Title
NCT01909973	2016	Northwestern University	"iCBT for Depression—Standard Versus Condensed Treatment Material"
NCT02801877	2017	Northwestern University	"Mobile-Web Emotion Self-Management Tool"
NCT01906476	2018	Northwestern University	"Efficacy of an Online Program for the Treatment of Mild and Moderate Depression"
NCT03162211	2020	Nova Scotia Health Authority	"Improving Quality-of-Life and Depressive Symptoms of Combat Veterans via Internet-Based Intervention"
NCT01990053	2017	Ohio State University	"Intervention for Depressed Latina Mothers of Children with Asthma"
NCT02837887	2018	Ohio State University Comprehensive Cancer Center	"Telephone-Based Counseling for Depression in Parkinson's Disease"
NCT01788657	2015	Örebro County, C. and Karolinska Institutet	"Web-Based CBT for Symptoms of Mild-to-Moderate Anxiety and Depression in Youth with Chronic Illness"
NCT02346591	2013	Oregon Center for Applied Science Inc	"Trial of a Nationwide Cognitive-Affective Remediation Training Intervention in Depression"
NCT02312583	2017	Parc de Salut Mar and Instituto de Salud Carlos III	"Research on Anxiety and Depression: Computer-Assisted Therapy"
NCT01231711	2010	Prevail Health Solutions L. L. C., Rise Consulting L. L. C. and McCormick Foundation	"Youth Mayo Clinic Anxiety Coach Randomized Controlled Trial"
NCT01326182	2011	Rhode Island Hospital and National Heart, L., Blood, Institute,	"Virtual Reality Exposure Therapy for Speech Anxiety Using Commercial Hardware and Software"
NCT02505737	2018	Rutgers The State University of New Jersey and Michael, J. F. F. f. P. s. R.	"Internet-Based Self-Help Treatment for Panic Disorder: Two Ways of Complementary Psychological Support"
NCT02453880	2015	Stanford University	"Randomized Trial of Depression Follow-up Care by Email"
NCT02075190	2016	Stanford University	"Internet-Delivered Cognitive Behavior Therapy for Anxiety and Depression Amongst French Canadians"
NCT02817438	2019	Stanford University	"Online Support Groups for Depression and Anxiety"
NCT02205203	2018	Stephen Whiteside, National Institute of Mental Health and Mayo Clinic	"The Efficacy of a Mobile Application for Treating Depression and Anxiety Symptoms"
NCT03001154	2017	Stockholm University	"Internet-Guided Cognitive Behavioural Therapy to Improve Depression Patients with Cardiovascular Disease"
NCT02402322	2014	Universitat Autònoma de Barcelona	"Internet-Delivered Acceptance and Commitment Therapy for Patients with Health Anxiety"
NCT01401296	2012	Universitätsklinikum Hamburg-Eppendorf	"A Controlled Trial of Patient Centered Telepsychiatry Interventions"
NCT01449890	2013	Universitätsklinikum Hamburg-Eppendorf	"Text Messaging and Cognitive Behavioral Therapy for Depression"
NCT03043833	2017	Universite de Moncton and Macquarie University Australia	"Healthy Mood Internet Intervention Research Project"
NCT01149265	2011	University College London	"Depression Management Project"
NCT03032952	2016	University College London and University of Roehampton	"Training and Supervision Program for Depression Management"
NCT02778074	2019	University Hospital Linköping	"Pilot Study of a Self-Help Intervention for Depression in Patients with a Chronic Disease"

Trial ID	Year	Affiliation	Title
NCT02735434	2017	University of Aarhus, Aarhus University Hospital and Karolinska Institutet	"A Two-Arm Intervention Study with Parallel Process Evaluation to Assess the Feasibility, Acceptability and Fidelity of the eMotion Online Intervention for People with Depressive Symptoms"
NCT01543815	2009	University of Bergamo	"Therapist Assisted Online Treatment for Anxiety"
NCT03024645	2018	University of Coimbra	"Effectiveness of Internet-Based Depression Treatment"
NCT02084979	2018	University of California, Davis	"Effectiveness of Internet-Based Depression Treatment (EVIDENT) in Severe Depression"
NCT01083628	2016	University of California, San Francisco	"Psychotherapeutic Text Messaging for Depression Pilot Study"
NCT01358487	2013	University of California, San Francisco, National Institute of Mental Health	"Improving Wellbeing and Social Anxiety Symptoms (Shyness)"
NCT01150604	2013	University of California, San Francisco, National Institute of Mental Health, and Robert Wood Johnson Foundation	"OxlGen: Oxford Imagery Generation: Investigating the Effects of an Internet Based Computer Program in Depression"
NCT02232854	2016	University of Chile	"Mobile App for Mood in Pregnancy (Ginger iO)"
NCT00854984	2009	University of Edinburgh, University of Stirling, Robert Gordon University, University of Glasgow	"Effectiveness of Online Systematic Brief Psychodynamic Psychotherapy for Neurotic Disorders: Randomized Controlled Trial"
NCT03084055	2017	University of Exeter and University of Glasgow	"Effectiveness of a Mobile Technology Intervention for the Treatment of Depression"
NCT01816204	2014	University of Florida	"SimCoach Evaluation: A Virtual Human Intervention to Encourage Servicemember Help-Seeking for PTSD and Depression"
NCT02178631	2014	University of Luebeck, Björn Meyer Gaia A. G. Hamburg, Germany Department of Psychology City University, London, United Kingdom, University of Hamburg, and University of Bern	"Implementation of a Self-Help Depression Program Among Orthopedic Patients"
NCT02872454	2016	University of Michigan	"Telehealth Depression Treatments for Older Adults"
NCT02451878	2018	University of Oxford and Australian National University	"Web-Based Interpretation Training for Anxiety"
NCT01443234	2013	University of Oxford and Lupina Foundation	"Connection to Care: Pilot Study of a Mobile Health Tool for Patients with Depression and Anxiety"
NCT02761720	2015	University of Pennsylvania and Ginger.io	"Depression Online Assessment and Therapy"
NCT02257996	2017	University of Sao Paulo	"Enhancing Delivery of Problem Solving Therapy Using SmartPhone Technology"
NCT02846662	2017	University of Sao Paulo General Hospital, National Institute of Mental Health, Universidad Peruana Cayetano Heredia, London School of Hygiene	"Telehealth Cognitive Behavioral Therapy for Depression in Parkinson's Disease (PD)"
NCT03103165	2013	University of Southern California and RAND Corporation	"Internet-Delivered Transdiagnostic Intervention for Anxiety and Depression"
NCT03083340	2017	University of Texas at Austin	"Online Acceptance and Commitment Therapy for Reducing Anxiety"
NCT02600754	2019	University of Texas at Austin, Baylor College of Medicine and University of Kansas Medical Center	"Internet-Delivered Psychotherapy for Depression"

Trial ID	Year	Affiliation	Title
NCT02382003	2017	University of Virginia	"Mindfulness and Acceptance-Based Treatments for Social Anxiety: Defusion App"
NCT02497755	2015	University of Washington	"Computerized Cognitive Behavioral Therapy and Electroconvulsive Therapy"
NCT02112266	2016	University of Zurich and Makora	"Comparison Study of Family Practice Interventions for Depression in Adults"
NCT01891734	2015	Veterans Affairs Office of Research Development	"Cognitive Bias Modification (CBM) and Internet Cognitive Behavioural Therapy (iCBT) for Depression—A Randomised Controlled Trial"
NCT02475954	2020	Veterans Affairs Office of Research Development, Department of Veterans Affairs, N.J. and Rutgers Robert Wood Johnson Medical School	"Using a Smartphone App to Reduce Cognitive Vulnerability and Mild Depressive Symptoms"
NCT02739607	2016	West University of Timisoara	"Reducing Depressive Symptomatology with a Smartphone App"
NCT03074669	2017	West University of Timisoara	"Web-Based Collaborative Care for Patients with Diabetes and Depression"
NCT02091856	2015	West University of Timisoara and Linköping University	"Developing a Low-Intensity Primary Care Intervention for Anxiety Disorders (AIM-PC)"
NCT02265211	2015	Wilfrid Laurier University	"Developing a Low-Intensity Primary Care Intervention for Anxiety Disorders"
NCT02953626	2017	Women's College, H., Centre for, A., Mental, H., Sunnybrook Health Sciences, C.	"Transdiagnostic iCBT for Depression and Anxiety"
NCT02176473	2015	Yale University	"Social Media Intervention for Postpartum Depression"

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