Review

Evidence on Technology-Based Psychological Interventions in Diagnosed Depression: Systematic Review

Moritz Köhnen[1], MSc; Mareike Dreier[1], Dipl Psych; Tharanya Seeralan[1], MSc; Levente Kriston[1], Dipl Psych, PhD; Martin Härter[1], Dipl Psych, MD, PhD; Harald Baumeister[2], Dipl Psych, PhD; Sarah Liebherz[1], Dipl Psych, PhD

[1]Department of Medical Psychology, University Medical Center Hamburg-Eppendorf, Hamburg, Germany

[2]Department for Clinical Psychology and Psychotherapy, Ulm University, Ulm, Germany

Corresponding Author:
Moritz Köhnen, MSc
Department of Medical Psychology
University Medical Center Hamburg-Eppendorf
Martinistr 52
Hamburg, 20246
Germany
Phone: 49 407410 ext 57705
Email: m.koehnen@uke.de

Abstract

Background: Evidence on technology-based psychological interventions (TBIs) for the treatment of depression is rapidly growing and covers a broad scope of research. Despite extensive research in this field, guideline recommendations are still limited to the general effectiveness of TBIs.

Objective: This study aims to structure evidence on TBIs by considering different application areas (eg, TBIs for acute treatment and their implementation in health care, such as stand-alone interventions) and treatment characteristics (eg, therapeutic rationale of TBIs) to provide a comprehensive evidence base and to identify research gaps in TBIs for diagnosed depression. Moreover, the reporting of negative events in the included studies is investigated in this review to enable subsequent safety assessment of the TBIs.

Methods: Randomized controlled trials on adults diagnosed with unipolar depression receiving any kind of psychotherapeutic treatment, which was at least partly delivered by a technical medium, were eligible for inclusion in our preregistered systematic review. We searched for trials in CENTRAL (Cochrane Central Register of Controlled Trials; until August 2020), MEDLINE, PsycINFO, PSYNDEX, CINAHL; until the end of January 2018), clinical trial registers, and sources of gray literature (until the end of January 2019). Study selection and data extraction were conducted by 2 review authors independently.

Results: Database searches resulted in 15,546 records, of which 241 publications were included, representing 83 completed studies and 60 studies awaiting classification (ie, preregistered studies, study protocols). Almost all completed studies (78/83, 94%) addressed the acute treatment phase, being largely either implemented as stand-alone interventions (66/83, 80%) or blended treatment approaches (12/83, 14%). Studies on TBIs for aftercare (4/83, 5%) and for bridging waiting periods (1/83, 1%) were scarce. Most TBI study arms (n=107) were guided (59/107, 55.1%), delivered via the internet (80/107, 74.8%), and based on cognitive behavioral treatment approaches (88/107, 79.4%). Almost all studies (77/83, 93%) reported information on negative events, considering dropouts from treatment as a negative event. However, reports on negative events were heterogeneous and largely unsystematic.

Conclusions: Research has given little attention to studies evaluating TBIs for aftercare and for bridging waiting periods in people with depression, even though TBIs are seen as highly promising in these application areas; thus, high quality studies are urgently needed. In addition, the variety of therapeutic rationales on TBIs has barely been represented by identified studies hindering the consideration of patient preferences when planning treatment. Finally, future studies should use specific guidelines to systematically assess and report negative events.

Trial Registration: International Prospective Register of Systematic Reviews (PROSPERO) CRD42016050413; https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42016050413.

International Registered Report Identifier (IRRID): RR2-10.1136/bmjopen-2018-028042

(JMIR Ment Health 2021;8(2):e21700) doi: 10.2196/21700

KEYWORDS

internet; telephone; psychotherapy; depression; depressive disorder; systematic review; mobile phone

Introduction

Depression is a common [1] and debilitating mental disorder for both affected individuals and society. It is often accompanied by psychosocial difficulties [2], increased mortality [3], concurrent psychological [4] and/or somatic disorders [5], and high societal costs [6]. There are many effective treatment options for people with unipolar depression, especially psychotherapeutic (eg, cognitive behavioral therapy [CBT], interpersonal therapy) and pharmacological treatments [1,7]. Despite the high prevalence, burden, and the presence of many effective treatment options, depression is still underrecognized [8] and undertreated [9]. For example, in Germany—with a comparatively well-developed mental health care system—only 54% of people with a lifetime diagnosis of major depression and 62% with dysthymia report lifetime service use, indicating barriers and gaps in the health care system [10]. Technology-based psychological interventions (TBIs) are one option to address barriers (eg, long waiting periods before starting a treatment) and gaps (eg, providing psychotherapeutic treatment in rural areas) in the context of mental health care [11]. We defined TBIs as psychotherapeutic or psychological interventions being (at least partly) delivered by technical mediums and tailored to the treatment of depression (eg, guided or unguided web-based self-help programs, telephone therapy, or the combination of onsite therapy and web-based self-help; see study protocol by Köhnen et al [12] for details).

TBIs cover a heterogeneous group of treatments, differing in various aspects, as described by Ebert et al [13]: technical aspects (ie, the application of different technologies such as email or telephone), the amount of human support (eg, TBIs with or without human support, using either synchronous or asynchronous communication), theoretical background (ie, TBIs can be based on different therapeutic rationales), and application areas (eg, TBIs can be provided in different clinical phases of depression management).

In the last decade, research on TBIs has grown rapidly [14], resulting in many randomized controlled trials (RCTs) on people with depression [15-17] as well as systematic reviews [18-20]. Despite extensive research efforts in the field of TBIs for depression treatment, there are still neglected issues, which we aim to address in our systematic review.

First, there is no systematic review that structures available evidence on TBIs regarding different clinical phases of depression management (considering waiting periods, acute treatment, and aftercare) and their implementation in health care (stand-alone intervention, blended care, and stepped and/or collaborative care). Thus, little is known about the effectiveness and acceptance of TBIs concerning their specific application area (eg, as stand-alone interventions for acute depression treatment), as the majority of systematic reviews focus on the assessment of a specific TBI in general, such as computerized CBT (cCBT) for depression [18]. Thus, current guideline recommendations are still limited to the general effectiveness of cCBT [1,7]. Given the large heterogeneity of TBIs, it is of great relevance—especially when deciding on the implementation of TBIs for health care systems—to determine the differential indication of TBIs considering structural (eg, different clinical phases of depression management), interventional (eg, technical medium of intervention delivery), and person-related (eg, symptom severity) determinants. This is the only way to answer what kind of TBIs are effective, accepted, and safe for whom under specific circumstances. Therefore, we aim to build and structure a comprehensive evidence base.

Second, to date, there is only one systematic review evaluating internet- and mobile-based interventions in people with formally diagnosed depression [19]. However, the vast majority of synthesizing research in this field includes studies based on cutoff scores of depression rating scales (ie, focusing on depressive symptoms) rather than focusing on studies using a formal diagnostic process (ie, focusing on depressive disorders), which is in turn required to initiate treatment (and not only prevention) in the mental health care system. In addition, high-quality evidence (RCTs) in clinical samples is the preferred source of evidence for the development and updating of clinical treatment guidelines, such as the German [1] and the United Kingdom [7] guidelines for depression.

Third, there is little research considering different types of negative events with regard to TBIs [21]. Although there are 2 meta-analyses assessing the safety of TBIs, both studies focused only on depressive symptom deterioration in guided [22] and self-administered [23] internet-based therapy. However, other types of negative events, such as treatment dropout, serious adverse events, nonresponse, or unwanted events (eg, frustration caused by technical problems) may occur during the course of internet-based therapy, which is relevant for safety assessment. In addition, depressive symptom deterioration was only assessed for a specific subsample of TBIs; deterioration regarding other delivery modes, such as telephone therapy, is still unknown. However, a comprehensive safety assessment is indispensable for reliable guideline recommendations, patient education, and individual treatment recommendations. By capturing whether (considering different types of) negative events are reported in the included studies, we aim to prestructure evidence for subsequent safety assessments on TBIs.

We chose the methodology of a systematic review to structure a broad and rapidly growing research field. First, the systematic review should provide an overview considering published and unpublished evidence—including gray literature—in the field of TBIs for the treatment of depression. Second, by considering relevant aspects of TBIs as defined by Ebert et al [13], we aim to structure available evidence to build a comprehensive evidence base for a subsequent, more differentiated assessment

of effectiveness, acceptance, and safety on TBIs and to identify research gaps.

In summary, our main aim is to structure available evidence on TBIs for the treatment of diagnosed depression, addressing the following research questions:

- How much high-quality evidence (ie, RCTs) on TBIs in the treatment of diagnosed depression is available?
- How is the evidence on TBIs distributed regarding general study characteristics (eg, year of publication)?
- How is the evidence on TBIs distributed regarding treatment characteristics (investigated TBI programs, technologies for intervention delivery, degree and purpose of guidance, qualification of people providing guidance, intervention duration, and therapeutic rationale) and application areas (different clinical phases of depression management and their implementation in mental health care)?
- Are negative events reported in studies of TBIs for the treatment of diagnosed depression and what kind of negative events are addressed (eg, symptom deterioration, nonresponse)?

Methods

This study was preregistered (PROSPERO registration number CRD42016050413), and a study protocol was published a priori [12]. This review is in accordance with the standards of the Cochrane Collaboration [24] (eg, preregistration, study protocol, systematic literature search considering gray literature, risk of bias assessment, statistical methods of data syntheses) and reported in line with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) statement [25].

Inclusion and Exclusion Criteria

We included studies if (1) the whole sample (≥80%) consisted of people (aged ≥18 years) diagnosed with unipolar depression (assessed by a formal classification system or by conducting a diagnostic interview) with any comorbidities and in any clinical phase of depression management, (2) the intervention was at least partly delivered through technical devices (eg, smartphones, computers, telephones), (3) the intervention was based on an explicit psychotherapeutic theory, and (4) the study was conducted as a (cluster) RCT.

We excluded studies if (1) participants were solely diagnosed by applying cutoff scores on depression scales or when they had a depressive episode in the course of a bipolar disorder; (2) concurrent conditions (either somatic or mental) were the main focus of the intervention; and (3) the intervention provided solely psychoeducational content, patient decision aids, depression management tools, or focused only on drug adherence.

The study protocol by Köhnen et al [12] provides more details on definitions and eligibility criteria.

Search Strategy

We searched the following key databases: CENTRAL (Cochrane Central Register of Controlled Trials), MEDLINE, PsycINFO, PSYNDEX, and CINAHL; see the study protocol by Köhnen et al [12] for the search strategies. The search was not limited by date, language, or publication status. We further searched clinical trial registers (ClinicalTrials.gov, International Clinical Trial Registry Platform, German Clinical Trial Register) and sources of gray literature (Open Grey, Trip Database, ProQuest Dissertations & Theses Abstract and Indexing, and [specialized registers of] ISI Web of Science). Finally, we contacted all the first authors of the included studies for additional information on (un)published trials and supplementary information or the status of ongoing studies (preregistered trials and study protocols).

Selection Procedure

In total, 2 reviewers (MK and SL) independently screened the first 100 records for inclusion. As the interrater reliability for this sample was found to be high (98%), only one reviewer (MK) screened the remaining records in the course of the title or abstract screening. However, a second reviewer (SL) assessed publications labeled as *unclear*. Selected full-text publications were subsequently assessed for inclusion by 2 independent reviewers (MK and MD). Discrepancies were resolved by discussion with a third reviewer (SL).

Data Extraction

We developed and piloted a standardized data extraction sheet containing characteristics of interest (see study protocol by Köhnen et al [12] for further information on extracted data). The data extraction sheet comprised information regarding general study information (eg, authors), methodological characteristics (including the risk of bias assessment), sample characteristics (eg, age), treatment characteristics, application areas, sample size and study flow, and primary (posttreatment scores of depression and treatment dropout rates) and secondary (eg, remission rates, quality of life) outcome data.

Essential characteristics were either judged (risk of bias assessment [24], rating of included trials on the efficacy-effectiveness spectrum [26]) or extracted (primary and secondary outcomes) independently by 2 reviewers (MK and MD or TS or Eileen Wehmann). Half of the included studies were extracted completely by 2 independent reviewers; in the other half, further characteristics (eg, therapeutic rationale of TBIs) were extracted by one reviewer (MK). Disagreements were resolved by discussion or by consulting a further reviewer (SL). As the aim was to structure evidence for TBIs, not all extracted data will be reported in this publication.

The risk of bias assessment was evaluated using the criteria described in the Cochrane Handbook for Systematic Reviews of Interventions [24] (including the domains: random sequence generation, allocation concealment, blinding of participants and personnel, blinding of outcome assessment, incomplete outcome data, selective outcome reporting, and other bias). In line with a previous operationalization [27], we specified the domain *other bias* using the following 3 categories: insufficient treatment adherence, allegiance bias, and attention bias.

Data Extraction: Classification of Negative Events

We applied the recommended definition of negative effects from the *consensus statement on defining and measuring negative effects of internet interventions* [21] to describe if

negative effects are reported in included studies. We waived using the term *effect* in this context, as it implies a causal relationship between treatment and harmful outcome; thus, we used the term *event* implying that a harmful outcome has occurred during or after treatment, independent of whether it was caused by it [24].

According to this, negative events comprise the following categories:

- Deterioration: worsening of target symptoms in the course of treatment measured by validated target symptom scales [21].
- Adverse events: any types of adverse events occurring during or after treatment, including physical symptoms (eg, headache); psychological symptoms (eg, depressed mood); and psychosocial, legal, and economic consequences (eg, conflicts with the partner) [27].
- Severe adverse events: any type of adverse events leading to serious consequences, such as death, mortal danger, hospitalization, or disability [28].
- Novel symptoms: novel symptoms describe the emergence of new psychological symptoms (other than the symptoms addressed in treatment), independent of whether novel symptoms are associated with treatment [21].
- Dropout from treatment.
- Nonresponse.
- Unwanted events: any type of events that are experienced as negative by patients in the course of the treatment, independently of whether unwanted events are associated with the treatment being used. In addition, unwanted events are not necessarily related to the treatment outcome, such as technical issues causing frustration or social stigma [21].

Data Analysis

We structured the included studies according to application areas: clinical phases of depression management consisted of waiting periods, acute treatment, and aftercare. Within different phases of depression management, TBIs can be distinguished concerning their implementation in mental health care. They can be delivered as stand-alone interventions (TBIs replacing face-to-face [F2F] therapy), as blended treatments (combining TBIs and F2F therapies), or as part of stepped (TBIs are used as low threshold, initial treatment options for people with a mild-to-moderate depressive disorder) and/or collaborative care models (TBIs may be provided alongside different treatment components, such as a TBI is offered in addition to a monitoring care manager, general practitioners' care, and the provision of an online discussion forum). In addition, treatment characteristics were used to structure the available evidence. We used descriptive statistics (eg, frequencies, measures of central tendency, measures of variability) for quantitative analysis using Microsoft Excel 2013 (Microsoft).

Patient Involvement

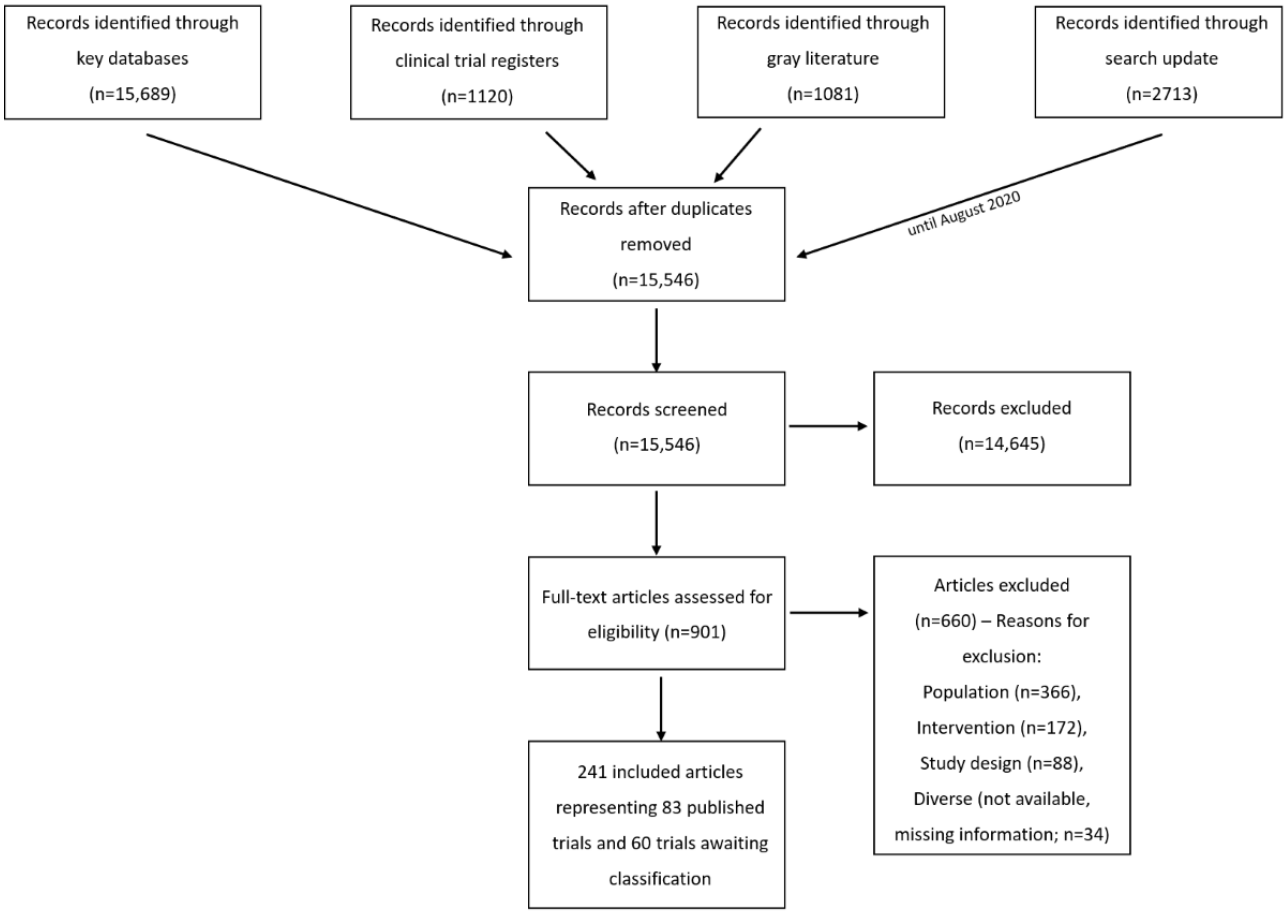
We actively involved patients and their relatives in the process of conducting our systematic review by means of 2 workshops (see study protocol by Köhnen et al [12] for details). The first workshop provided general information on systematic reviews and TBIs, and we collected the most relevant outcome domains concerning TBIs from a patient or relative perspective. The second workshop provided study findings and discussed the results of reporting practices concerning these patient-relevant outcomes.

Results

Search Results

Electronic searches yielded 20,613 records. After deduplication, 15,546 records were screened by title or abstract. In total, 901 full-text articles were assessed for eligibility. Not fulfilling the population criteria was the major reason (366/901, 40.6%) for exclusion, as many studies included their participants by applying cutoff scores on depression rating scales, rather than including participants on the basis of a formal diagnostic process (eg, clinical interview). Other reasons for exclusion were not fulfilling intervention (172/901, 19.1%) and study design (88/901, 9.8%) criteria. The remaining studies (34/901, 4.0%) were excluded for diverse reasons: publications were unavailable or relevant study information was missing (eg, distribution of diagnoses across the sample) and also not retrievable by contacting corresponding authors. Overall, we included 241 publications representing 143 trials (83 published trials and 60 trials awaiting classification) covering all clinical phases of depression management. Figure 1 provides a detailed study flow.

Figure 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flowchart.



General Study Characteristics

Overall, the identified studies (N=83) included 14,080 participants, ranging from 14 to 1089 per study. The mean age of the participants was 44.9 (SD 12.1) years, and two-thirds were female (67%; see Multimedia Appendix 1 for details [15-17,29-108]).

Most included trials had a trial registration (58/83, 70%), and approximately one-fourth (22/83, 27%) of the included trials had an accompanying study protocol (Table 1). The most common source of risk of bias was nonblinding of participants and personnel (as blinding is barely possible in psychotherapy research), selective reporting, and other bias (especially because of insufficient treatment adherence; see Multimedia Appendix 2 for details)

Studies on TBIs for depression were published from 1990 to the date of our search update in August 2020 (Table 2). The geographical region and country of trials are shown in Table 3.

Table 1. General study characteristics (N=83).

Variables	Studies, n (%)
Registration of studies and publication of study protocols	
Trials with study registration	58 (70)
With study protocol	21 (25)
Without study protocol	37 (45)
Trials without study registration	25 (29)
With study protocol	1 (1)
Without study protocol	24 (28)
Number of study arms in included trials	
2	64 (77)
3	16 (19)
≥4	3 (4)

Table 2. Publications on TBIs for depression per decade (N=83).

Decade	Studies, n (%)
1990 to 1999	2 (2)
2000 to 2009	4 (5)
2010 to 2019	69 (83)
2020 (end of August)	8 (10)

Table 3. Trials by geographical region (N=83).

Geographical region	Studies, n (%)
Europe	44 (53)
North America	23 (28)
Australia	9 (11)
Asia	7 (8)

Treatment Characteristics

Investigated TBI Programs

Overall, 26 specific TBI programs were evaluated in the included studies; 18 of these programs were evaluated by 1 study, and 8 were evaluated by more than 1 study. However, approximately half of the studies (40/83, 48%) did not provide a name for the applied TBI program (Multimedia Appendix 3 [15-17,29-109]).

Technologies for Intervention Delivery

We identified 107 arms (from 189 arms) in the included studies that applied TBIs. Most TBIs (78%) were delivered by one technical medium (eg, internet or telephone), whereas 22% of TBIs applied more than one technical medium (eg, internet and telephone). Most TBIs were delivered via the internet (54%), followed by telephone (11%), offline computer programs (7%), videoconferencing tools (3%), and mobile phones delivering text messages (2%; see Multimedia Appendix 4 for details).

Purpose of Guidance

The purpose of guidance in TBIs was heterogeneous (Multimedia Appendix 3).

To structure the guidance in TBIs, we summarized the reported purposes of guidance to categories and identified 5 functions of guidance: (1) informative function (eg, answering queries related to technical issues or treatment), (2) monitoring function (eg, symptom monitoring), (3) adherence-facilitating or motivational function (eg, encouragement to continue with intervention), (4) feedback function (eg, providing feedback for homework), and (5) therapeutic function (eg, goal setting).

Most guided TBIs fulfilled more than one function addressing different needs of participants.

Degree of Guidance in TBIs

We rated the degree of guidance in TBIs according to the framework of Newman et al [109], consisting of 4 categories, as follows: self-administered therapy, predominantly self-help, minimal-contact therapy, and predominantly therapist-administered intervention.

Trials applying blended treatments were classified in an extra category because these trials provide F2F guidance (eg, by psychotherapists) The included trials applied TBI arms that were either unguided (20/107, 18.7%), guided (59/107, 55.1%; combination of predominantly self-help, 46/107, 43.0%, and minimal contact therapy, 13/107, 12.1%), therapist-delivered (14/107, 13.1%), or blended treatments (14/107, 13.1%).

Qualifications of People Providing Guidance

The qualification of people who provided guidance on TBIs and who delivered treatment via TBIs ranged from lay supporters (technicians, research assistants, etc; 8/71, 11%) to clinicians with experience in the treatment of people with mental illness (trained psychotherapists, 6/71, 8% as well as psychiatrists, 1/71, 1%). Most people providing guidance and delivered treatment via TBIs had a background in psychology (36/71, 51%).

Interventions' Duration

Interventions' duration of identified TBIs ranged from 1 to 52 weeks, with most interventions lasting between 6 and 12 weeks (median treatment length of 8.5 weeks). Interventions of 8-week duration were the most frequent (26/107, 24.3%) in the included studies.

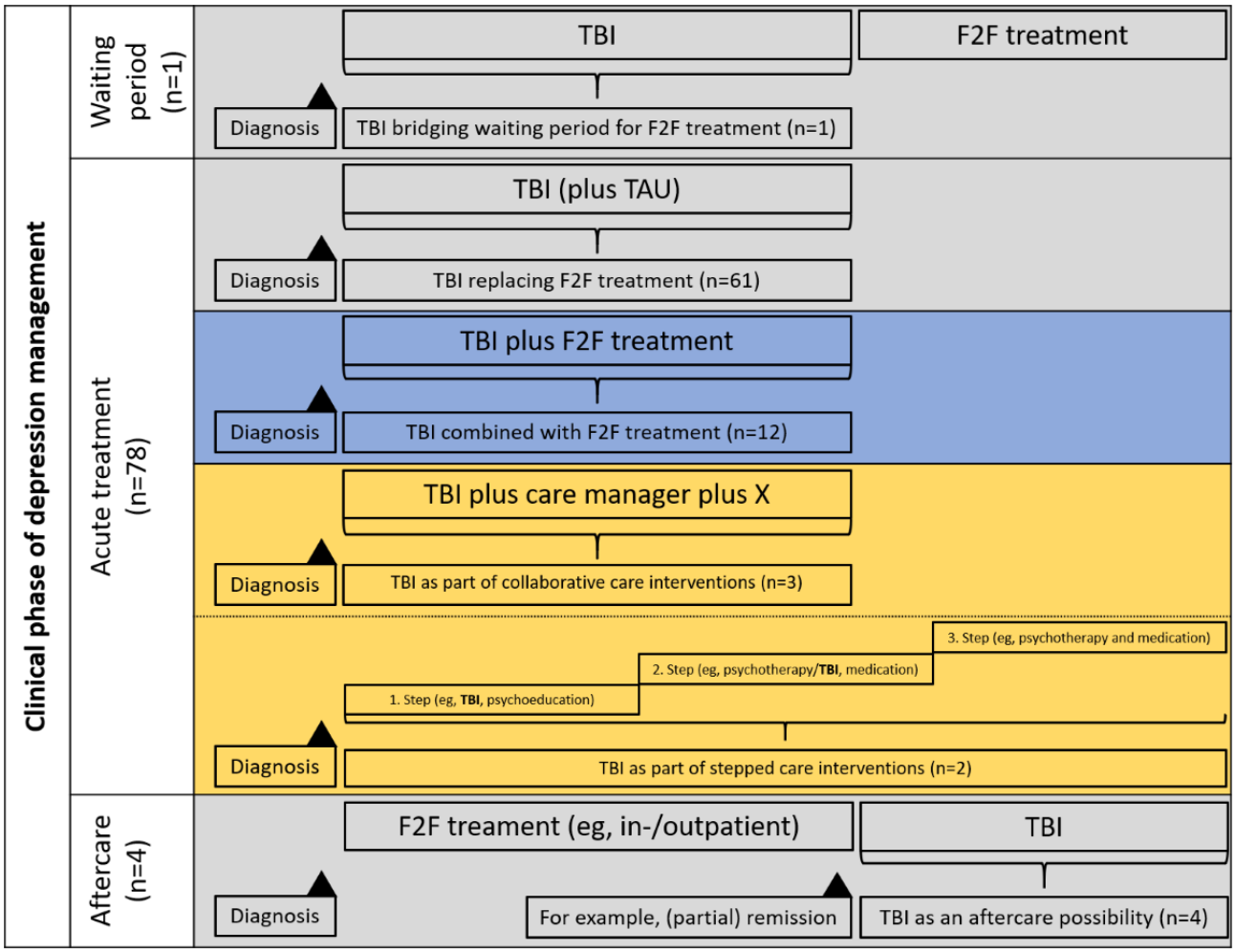
Therapeutic Rationale of TBIs

Overall, we identified 15 different therapeutic rationales for TBIs, ranging from mindfulness to psychodynamic therapy. Most TBIs were based on cognitive behavioral treatment approaches (79%; Multimedia Appendix 5).

Application Areas of TBIs

Concerning the clinical phase of depression management, almost all trials were related to the acute treatment of people with acute depression (94%), followed by trials addressing the aftercare of people with depression (5%), and one trial that applied a TBI as a tool for bridging waiting periods (1%). Regarding the implementation of mental health care, most TBIs were delivered as a (enhanced) stand-alone intervention (80%), followed by blended treatment approaches (14%), and 5 studies (6%) delivered TBIs as part of a collaborative (4%) or stepped (2%) care interventions (Figure 2).

Figure 2. Distribution of studies (N=83) on application areas. Color highlighting of cells indicates format of implementation of TBIs: grey = (enhanced) stand-alone intervention; blue = blended treatment approach; yellow = TBI as part of collaborative/stepped care interventions. TAU: treatment as usual; TBI: technology-based psychological intervention; F2F: face-to-face.



We applied a rather broad definition for blended treatments, since we included all studies that provided any type of F2F treatment tailored to depression (eg, psychotherapy, medication, depression specific GP care) in addition to TBIs irrespective of the study's definition/label. In contrast, trials concurrently providing treatment as usual in addition to TBIs were considered as enhanced stand-alone interventions, if treatment as usual consisted of a systematically offered generic treatments (eg, general GP care for all participants) that was not specifically tailored to depression.

Report of Negative Events

Most studies (70/83, 84%) reported dropout rates. However, reporting on dropouts is heterogeneous, as studies differed in their definitions on dropouts: there were studies reporting dropouts from treatment (or treatment completion rates; 38/83, 46%), whereas other studies applied other definitions of dropouts, for instance, treatment completers as defined by authors or withdrawals from the study (32/83, 39%), and approximately 16% (13/83) of included studies did not report any extractable dropouts (Table 4; see Multimedia Appendix 6 [15-17,29-108] for an overview on negative events). On average, the included trials reported on 1.67 (SD 1.06; range 0-5) categories of negative events (out of 7 potential categories).

Table 4. Report of negative events in included studies (N=83).

Report of negative events	Studies, n (%)
Dropout	70 (84)
Deterioration	21 (25)
Adverse events	18 (22)
Nonresponse	16 (19)
Severe adverse events	14 (17)
Novel Symptoms	0 (0)
Unwanted Events	0 (0)

Discussion

Principal Findings

The aim of our study was to structure available evidence on TBIs for the treatment of diagnosed depression to build a comprehensive evidence base and to identify research gaps.

Application Areas

As shown in Figure 2, the vast majority (94%) of the included studies focused on the acute treatment phase. Significantly less evidence was available for TBIs in aftercare (5%) and for TBIs bridging waiting periods (1%), indicating research gaps despite extensive discussions on their usefulness in these clinical phases of depression management. For example, TBIs for bridging waiting periods may help to establish early symptom reduction [11] or to counteract symptom manifestation, which may prevent aggravation, recurrence, and the experience of a persistent course for people on waiting lists for treatment. Furthermore, TBIs may prepare for F2F treatments by providing, for example, psychoeducational information on depression (eg, symptoms) [11] so that there is subsequently more time for working on therapeutic content (eg, behavioral activation). TBIs in aftercare are seen as (potentially) useful tools providing an aftercare possibility attached to inpatient treatment with lower barriers (eg, waiting periods) compared with traditional aftercare approaches [110]. In view of the fact that we have identified only a few studies for aftercare [16,29-31] and one for bridging waiting periods [32], the question arises whether firm conclusions about the effectiveness and acceptance of these clinical phases can be made on the basis of the available evidence. This is also supported by looking at the level of synthesizing research, as only 2 reviews [111,112], which dealt with one of these phases, could be identified. However, even if these reviews were based on broader inclusion criteria (eg, the presence of a [former] depressive disorder was not required), they could identify only a few—quite heterogeneous—studies and could not draw firm conclusions about effectiveness and acceptance in these clinical phases of depression care [111,112]. Given the unconvincing evidence base and the probable potential of TBIs to overcome treatment barriers for aftercare and in bridging waiting periods, it is of great relevance to conduct research on TBIs in these specific clinical phases of depression management, at best pragmatic large-scale RCTs with people having diagnosed depression, so that a comprehensive assessment, also decisive for guideline recommendations, is possible in the future.

In addition, most studies implemented TBIs either as (enhanced) stand-alone interventions (80%) or as blended treatment approaches (14%) in the acute treatment phase of depression treatment, indicating a comprehensive evidence base useful for further analyses on the differential indication for this clinical phase of depression management. There is little evidence on TBIs as part of collaborative (4%) or stepped (2%) care interventions in our review (Figure 2), which may be traced back to the fact that studies were only considered if the results were differentially reported for the technology-based treatment component.

Stepped care approaches incorporating TBIs are recommended by the German [1] and the United Kingdom [7] guidelines for improving depression care. In addition, stepped care approaches are seen as promising options to up-scale (depression) treatment options being concurrently more cost-effective compared with other approaches, especially when TBIs are integrated. Thus, care within stepped care models is initially offered as a low-threshold (and low-cost) intervention with constant symptom monitoring. When patients do not respond to an intervention, they will be stepped up receiving more intensive interventions. However, to the best of our knowledge, there is no meta-analysis on the effectiveness of stepped care approaches with TBIs, indicating that a sufficient evidence base is missing. In contrast, traditional stepped care approaches without TBIs have been found to be effective for treating depression [113]. Thus, not surprisingly, we only identified 2 studies [33,34] offering TBIs (internet-based CBT) as a low-threshold intervention in the course of a stepped care approach. To assess the usefulness of specific TBIs within stepped care approaches, we need studies testing different treatment options comparatively at different levels of the stepped care approach (for instance, first step: watchful waiting vs iCBT (internet-based CBT) vs bibliotherapy; second step: F2F psychotherapy vs telephone psychotherapy). In addition, studies would be useful for assessing both the whole stepped care approach depending on whether a TBI component was implemented (eg, [non]provision of iCBT as a low-threshold first-step intervention) and the benefit of these components within the stepped care approach (eg, pre-post gains, stepping-up rates, step-specific adherence rates).

In summary, there is evidence on the acute treatment phase of depression, and there are promising approaches to improve mental health care for people with depression by using TBIs. However, there are only a few studies investigating TBIs outside of acute treatment and applying innovative treatment

approaches, which is why we call for (1) more research in previously less-considered clinical phases of depression management (aftercare, waiting periods) and (2) more studies investigating stepped care approaches with different TBI components.

Treatment Characteristics

We found that most TBIs were based on cognitive behavioral treatment approaches (79%), especially CBT (65%), and that other guideline-recommended treatment rationales for F2F depression treatment, such as psychodynamic treatments, are barely researched in TBIs of diagnosed depression. This may be because of the fact that psychodynamic-oriented therapists have a more negative attitude toward internet interventions compared with other therapists [114]. In addition, there is an ongoing debate in the psychodynamic community—at least in German-speaking countries—concerning whether an adequate therapeutic alliance, which is emphasized being a central treatment component, can be established in treatments outside of the F2F setting, as, for example, certain cues (visual and/or auditive) are missing [115]. However, recent reviews suggest that establishing a sustainable therapeutic alliance may be possible when treatment is delivered by different technical mediums [116,117]. Another reason cognitive behavioral rationales are particularly suitable may be because of their more manualized content [118]. Content intended for F2F treatment may be easier transferred to other settings and, for example, made available via web-based programs.

Owing to the lack of studies investigating other approaches recommended by guidelines, we call for more studies on TBIs considering a broader variety of treatment approaches. This would allow for more differentiated guideline recommendations, as they are currently limited to the effectiveness of cCBT [1,7]. In addition, patient preferences regarding TBIs could be considered when treatment is planned because preferences (CBT vs psychodynamic therapy) seem to have predictive value for treatment outcome in internet-delivered interventions [119] and significantly affect outcomes in regular treatment of mental disorders [120].

Report of Negative Events

Considering the report of negative events in included studies, we found that apart from dropouts, other negative events such as deterioration, nonresponse, and (severe) adverse events were reported in a few studies (range 17%-25%) or not at all (unwanted events and novel symptoms). Although dropouts were reported by most studies (84%), there were reported quite heterogeneously, as only 46% of all studies reported dropouts from treatment (or completion rates), which is an important indicator for treatment adherence in TBIs. For example, it is well known that unguided TBIs produce significantly more dropouts than guided TBIs [18]. Dropout rates (as an indicator for treatment adherence and therefore also for safety) have to be considered when comparing other treatment characteristics (eg, video vs telephone). Moreover, 39% of studies reported other kinds of dropouts (eg, withdrawals from study, treatment completers, as defined by the authors). This kind of dropouts is less meaningful, as the link to treatment adherence or safety is less clear.

Although adverse events have been reported in 22% of studies, many studies have reported adverse events unsystematically. For instance, by stating that no adverse events have been noted for any study participants, which did not specify the method of capturing adverse events as well as the definition of adverse events in included trials. It was not clear if participants were asked about the occurrence of adverse events during or after treatment. On the other hand, there were trials systematically assessing adverse events, for instance, by mapping them to different symptom domains (eg, somatically and psychologically) and specifying time points for the assessment. In total, the method on how and when adverse events were captured remained unclear in most included studies, which may contribute to an underestimation of the occurrence of adverse events because it is more likely to report such events when specifically asked for it in comparison to spontaneous reports [121,122].

Our findings on the report of negative events are in line with a previous systematic review, which also noted that adverse events were heterogeneous and insufficiently reported in RCTs on people with a persistent depressive disorder, especially in psychotherapeutic studies, where the report of adverse events was largely neglected [123]. However, in our review, when all categories of negative events were considered, almost all studies reported at least some information on negative events (93%); nonetheless, the reporting between studies on certain categories (eg, dropouts) was inconsistent. This inconsistency may be explained by the fact that included trials considered more generic reporting guidelines (eg, Consolidated Standards of Reporting Trials [CONSORT]), rather than considering specific guidelines or guideline extensions (eg, CONSORT Extensions [for harms]), as they are rarely endorsed by high-impact journals [124], which may also influence authors' use [125].

Given the great heterogeneity in the reporting of negative events in included studies, we suggest the use of specific guidelines or guideline extensions to future trialists, such as the CONSORT extensions for harms [126], which may help make the report more precise and homogeneous, by for instance clarifying how information concerning negative events was collected.

Strengths and Limitations

Our review was conducted in line with the Cochrane guidelines, reported following PRISMA guidelines [25], and studies were selected according to prespecified criteria [12], reflecting high methodological standards. However, we deviated from the study protocol by waiving an additional forward and backward reference search because our systematic literature search was already very comprehensive.

Despite strict eligibility criteria (eg, diagnosed depression), the focus of our review is still broad because all TBIs were considered irrespective of application areas and certain treatment characteristics. Following a broad focus resulted in large heterogeneity of the included studies, which is probably challenging for subsequent meta-analyses. It may be possible that certain questions regarding the differential indication are unsuitable for evidence synthesis because of large heterogeneity (eg, differences in intervention duration) or because there are

not enough studies available (eg, evidence for TBIs bridging waiting periods [n=1]).

We conducted a highly sensitive literature search considering key databases, databases of gray literature, and clinical trial registries, without limiting the literature search to language. Nonetheless, we may have missed trials published in languages other than English because databases containing primarily English records may fail to find trials published in other languages even when language restrictions were avoided [127].

Conclusions

Overall, the results indicated that there is a proper evidence base for TBIs in the acute treatment phase being either implemented as stand-alone or blended treatments. However, the evidence base of TBIs in aftercare or for bridging waiting periods was found to be hardly convincing. Moreover, most TBIs were theoretically based on cognitive behavioral treatment rationales. Thus, a (broader) evidence base including TBIs based on other therapeutic rationales is still missing.

Concerning the report of negative events in studies evaluating TBIs, it was found that some information on negative events was reported in almost all studies, but the report was quite inconsistent between studies.

Despite the unequal distribution of evidence concerning differing clinical phases of depression management and treatment characteristics, we compiled a comprehensive evidence base to subsequently assess the effectiveness, safety, and acceptance of TBIs.

Acknowledgments

The authors thank Eileen Wehmann for her support in the data extraction process. The Federal Ministry of Education and Research (in German: Bundesministerium für Bildung und Forschung) funded the systematic review on the comparative effectiveness of technology-based interventions in different steps of depression care (TIDECA; funding code: 01KG1705, funding period: August 2017 to October 2019). The funding institution had no role in the design of this study, its execution, analyses, interpretation of the data, or the decision to submit results.

Conflicts of Interest

HB received consultancy fees, reimbursement of congress attendance, and travel costs as well as payments for lectures from psychotherapy and psychiatry associations as well as psychotherapy training institutes in the context of e–mental health topics. He has been the beneficiary of study support (third-party funding) from several public funding organizations. HB and MH participated in the current revision of the German S3 national clinical practice guideline on the treatment of adults with unipolar depression. MH and LK participated in the 2015 revision of the German S3 national clinical practice guideline on the treatment of adults with unipolar depression. MH and SL are licensed psychotherapists. SL is additionally employed at the institute for psychotherapy at the University Medical Center Hamburg-Eppendorf, which provides psychotherapist training in CBT. MK and MD are psychotherapists in training (CBT). TS is a psychotherapist in training (psychodynamic therapy).

Multimedia Appendix 1

Study characteristics.
[PDF File (Adobe PDF File), 307 KB-Multimedia Appendix 1]

Multimedia Appendix 2

Risk of bias assessment.
[PDF File (Adobe PDF File), 74 KB-Multimedia Appendix 2]

Multimedia Appendix 3

Treatment characteristics of technology-based psychological interventions.
[PDF File (Adobe PDF File), 322 KB-Multimedia Appendix 3]

Multimedia Appendix 4

Technologies for intervention delivery.
[PDF File (Adobe PDF File), 126 KB-Multimedia Appendix 4]

Multimedia Appendix 5

Therapeutic rationales of technology-based psychological interventions.
[PDF File (Adobe PDF File), 128 KB-Multimedia Appendix 5]

Multimedia Appendix 6

Report of negative events.
[PDF File (Adobe PDF File), 195 KB-Multimedia Appendix 6]

References

1. DGPPN, BÄK, KBV, AWMF for the guideline group unipolar depression. S3 Guideline/National Disease Management Guideline Unipolar Depression – Long Version, 2nd edition. Version 5. 2015. URL: www.depression.versorgungsleitlinien.de
2. Cabello M, Mellor-Marsá B, Sabariego C, Cieza A, Bickenbach J, Ayuso-Mateos JL. Psychosocial features of depression: a systematic literature review. J Affect Disord. Dec 01, 2012;141(1):22-33. [doi: 10.1016/j.jad.2011.12.009] [Medline: 22209189]
3. Chesney E, Goodwin GM, Fazel S. Risks of all-cause and suicide mortality in mental disorders: a meta-review. World Psychiatry. Jun 2014;13(2):153-160. [FREE Full text] [doi: 10.1002/wps.20128] [Medline: 24890068]
4. Kessler RC, Nelson CB, McGonagle KA, Liu J, Swartz M, Blazer DG. Comorbidity of DSM-III-R major depressive disorder in the general population: results from the US National Comorbidity Survey. Br J Psychiatry Suppl. Jun 1996;168(30):17-30. [Medline: 8864145]
5. Hare DL, Toukhsati SR, Johansson P, Jaarsma T. Depression and cardiovascular disease: a clinical review. Eur Heart J. Jun 1, 2014;35(21):1365-1372. [FREE Full text] [doi: 10.1093/eurheartj/eht462] [Medline: 24282187]
6. The global burden of disease: 2004 update. World Health Organization. Geneva. WHO Press; 2008. URL: https://apps.who.int/iris/bitstream/handle/10665/43942/9789241563710_eng.pdf [accessed 2018-10-04]
7. Depression: the treatment and management of depression in adults: Full guideline (Draft for Consultation). National Institute for Health and Care Excellence. 2017. URL: https://www.nice.org.uk/guidance/gid-cgwave0725/documents/draft-guideline [accessed 2018-05-02]
8. Mitchell AJ, Vaze A, Rao S. Clinical diagnosis of depression in primary care: a meta-analysis. Lancet. Aug 22, 2009;374(9690):609-619. [doi: 10.1016/S0140-6736(09)60879-5] [Medline: 19640579]
9. Kohn R, Saxena S, Levav I, Saraceno B. The treatment gap in mental health care. Bull World Health Organ. Nov 2004;82(11):858-866. [FREE Full text] [Medline: 15640922]
10. Mack S, Jacobi F, Gerschler A, Strehle J, Höfler M, Busch MA, et al. Self-reported utilization of mental health services in the adult German population--evidence for unmet needs? Results of the DEGS1-Mental Health Module (DEGS1-MH). Int J Methods Psychiatr Res. Sep 2014;23(3):289-303. [FREE Full text] [doi: 10.1002/mpr.1438] [Medline: 24687693]
11. Köhnen M, Dirmaier J, Härter M. [Potentials and challenges of e-mental health interventions in mental health care]. Fortschr Neurol Psychiatr. Mar 2019;87(3):160-164. [doi: 10.1055/a-0853-2568] [Medline: 30891717]
12. Köhnen M, Kriston L, Härter M, Dirmaier J, Liebherz S. Rationale and design of a systematic review: effectiveness and acceptance of technology-based psychological interventions in different clinical phases of depression management. BMJ Open. Mar 27, 2019;9(3):e028042. [doi: 10.1136/bmjopen-2018-028042]
13. Ebert DD, Van Daele T, Nordgreen T, Karekla M, Compare A, Zarbo C, et al. Internet- and mobile-based psychological interventions: applications, efficacy, and potential for improving mental health. Eur Psychol. Apr 2018;23(2):167-187. [doi: 10.1027/1016-9040/a000318]
14. Hautzinger M, Fuhr K. [Can online therapy meaningfully complement psychotherapy? Pro]. Nervenarzt. Jan 2018;89(1):94-95. [doi: 10.1007/s00115-017-0379-y] [Medline: 28776211]
15. Steinmann M, Heddaeus D, Liebherz S, Daubmann A, Härter M, Watzke B. Effectiveness of telephone-administered cognitive-behavioral psychotherapy for depression with versus without additional letters: a randomized controlled trial. Telemed J E Health. Mar 2020;26(3):347-353. [doi: 10.1089/tmj.2018.0311] [Medline: 31013466]
16. Holländare F, Johnsson S, Randestad M, Tillfors M, Carlbring P, Andersson G, et al. Randomized trial of internet-based relapse prevention for partially remitted depression. Acta Psychiatr Scand. Oct 2011;124(4):285-294. [doi: 10.1111/j.1600-0447.2011.01698.x] [Medline: 21401534]
17. Perini S, Titov N, Andrews G. Clinician-assisted Internet-based treatment is effective for depression: randomized controlled trial. Aust N Z J Psychiatry. Jun 2009;43(6):571-578. [doi: 10.1080/00048670902873722] [Medline: 19440890]
18. Richards D, Richardson T. Computer-based psychological treatments for depression: a systematic review and meta-analysis. Clin Psychol Rev. Jun 2012;32(4):329-342. [doi: 10.1016/j.cpr.2012.02.004] [Medline: 22466510]
19. Königbauer J, Letsch J, Doebler P, Ebert DD, Baumeister H. Internet- and mobile-based depression interventions for people with diagnosed depression: a systematic review and meta-analysis. J Affect Disord. Dec 01, 2017;223:28-40. [doi: 10.1016/j.jad.2017.07.021] [Medline: 28715726]
20. Andersson G, Cuijpers P. Internet-based and other computerized psychological treatments for adult depression: a meta-analysis. Cogn Behav Ther. 2009;38(4):196-205. [doi: 10.1080/16506070903318960] [Medline: 20183695]
21. Rozental A, Andersson G, Boettcher J, Ebert DD, Cuijpers P, Knaevelsrud C, et al. Consensus statement on defining and measuring negative effects of internet interventions. Internet Interventions. Mar 2014;1(1):12-19. [doi: 10.1016/j.invent.2014.02.001]

22. Ebert DD, Donkin L, Andersson G, Andrews G, Berger T, Carlbring P, et al. Does internet-based guided-self-help for depression cause harm? An individual participant data meta-analysis on deterioration rates and its moderators in randomized controlled trials. Psychol Med. Oct 2016;46(13):2679-2693. [doi: 10.1017/S0033291716001562] [Medline: 27649340]
23. Karyotaki E, Kemmeren L, Riper H, Twisk J, Hoogendoorn A, Kleiboer A, et al. Is self-guided internet-based cognitive behavioural therapy (iCBT) harmful? An individual participant data meta-analysis. Psychol Med. Nov 2018;48(15):2456-2466. [FREE Full text] [doi: 10.1017/S0033291718000648] [Medline: 29540243]
24. Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0 [updated March 2011]. The Cochrane Collaboration; 2011. URL: https://handbook-5-1.cochrane.org/ [accessed 2021-01-11]
25. Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. PLoS Med. Jul 21, 2009;6(7):e1000097. [FREE Full text] [doi: 10.1371/journal.pmed.1000097] [Medline: 19621072]
26. Wieland LS, Berman BM, Altman DG, Barth J, Bouter LM, D'Adamo CR, et al. Rating of Included Trials on the Efficacy-Effectiveness Spectrum: development of a new tool for systematic reviews. J Clin Epidemiol. Apr 2017;84:95-104. [FREE Full text] [doi: 10.1016/j.jclinepi.2017.01.010] [Medline: 28188898]
27. Machmutow K, Meister R, Jansen A, Kriston L, Watzke B, Härter MC, et al. Comparative effectiveness of continuation and maintenance treatments for persistent depressive disorder in adults. Cochrane Database Syst Rev. May 20, 2019;5:CD012855. [FREE Full text] [doi: 10.1002/14651858.CD012855.pub2] [Medline: 31106850]
28. What is a serious adverse event? U.S. Food and Drug Administration. 2016. URL: https://www.fda.gov/safety/reporting-serious-problems-fda/what-serious-adverse-event [accessed 2020-11-25]
29. Kok G, Burger H, Riper H, Cuijpers P, Dekker J, van Marwijk H, et al. The three-month effect of mobile internet-based cognitive therapy on the course of depressive symptoms in remitted recurrently depressed patients: results of a randomized controlled trial. Psychother Psychosom. Feb 21, 2015;84(2):90-99. [doi: 10.1159/000369469] [Medline: 25721915]
30. Schlicker S, Ebert DD, Middendorf T, Titzler I, Berking M. Evaluation of a text-message-based maintenance intervention for Major Depressive Disorder after inpatient cognitive behavioral therapy. J Affect Disord. Feb 2018;227:305-312. [doi: 10.1016/j.jad.2017.10.047]
31. Zwerenz R, Becker J, Johansson R, Frederick RJ, Andersson G, Beutel ME. Transdiagnostic, psychodynamic web-based self-help intervention following inpatient psychotherapy: results of a feasibility study and randomized controlled trial. JMIR Ment Health. Oct 16, 2017;4(4):e41. [FREE Full text] [doi: 10.2196/mental.7889] [Medline: 29038094]
32. Kenter RM, Cuijpers P, Beekman A, van Straten A. Effectiveness of a web-based guided self-help intervention for outpatients with a depressive disorder: short-term results from a randomized controlled trial. J Med Internet Res. Mar 31, 2016;18(3):e80. [FREE Full text] [doi: 10.2196/jmir.4861] [Medline: 27032449]
33. Mohr DC, Lattie EG, Tomasino KN, Kwasny MJ, Kaiser SM, Gray EL, et al. A randomized noninferiority trial evaluating remotely-delivered stepped care for depression using internet cognitive behavioral therapy (CBT) and telephone CBT. Behav Res Ther. Dec 2019;123. [doi: 10.1016/j.brat.2019.103485]
34. Richards D, Enrique A, Eilert N, Franklin M, Palacios J, Duffy D, et al. A pragmatic randomized waitlist-controlled effectiveness and cost-effectiveness trial of digital interventions for depression and anxiety. npj Digit. Med. Jun 15, 2020;3(85). [FREE Full text] [doi: 10.1038/s41746-020-0293-8] [Medline: 32566763]
35. Agyapong VI, Juhás M, Ohinmaa A, Omeje J, Mrklas K, Suen VY, et al. Randomized controlled pilot trial of supportive text messages for patients with depression. BMC Psychiatry. Aug 02, 2017;17(1):286. [FREE Full text] [doi: 10.1186/s12888-017-1448-2] [Medline: 28768493]
36. Andersson G, Hesser H, Veilord A, Svedling L, Andersson F, Sleman O, et al. Randomised controlled non-inferiority trial with 3-year follow-up of internet-delivered versus face-to-face group cognitive behavioural therapy for depression. J Affect Disord. Dec 2013;151(3):986-994. [doi: 10.1016/j.jad.2013.08.022] [Medline: 24035673]
37. Arjadi R, Nauta M, Scholte W, Hollon S, Chowdhary N, Suryani A, et al. Internet-based behavioural activation with lay counsellor support versus online minimal psychoeducation without support for treatment of depression: a randomised controlled trial in Indonesia. Lancet Psychiatry. Sep 2018;5(9):707-716. [doi: 10.1016/S2215-0366(18)30223-2] [Medline: 30006262]
38. Berger T, Hämmerli K, Gubser N, Andersson G, Caspar F. Internet-based treatment of depression: a randomized controlled trial comparing guided with unguided self-help. Cogn Behav Ther. 2011;40(4):251-266. [doi: 10.1080/16506073.2011.616531] [Medline: 22060248]
39. Berger T, Krieger T, Sude K, Meyer B, Maercker A. Evaluating an e-mental health program ('deprexis') as adjunctive treatment tool in psychotherapy for depression: Results of a pragmatic randomized controlled trial. J Affect Disord. Feb 2018;227:455-462. [doi: 10.1016/j.jad.2017.11.021] [Medline: 29154168]
40. Blackwell SE, Browning M, Mathews A, Pictet A, Welch J, Davies J, et al. Positive imagery-based cognitive bias modification as a web-based treatment tool for depressed adults: a randomized controlled trial. Clin Psychol Sci. Jan 2015;3(1):91-111. [FREE Full text] [doi: 10.1177/2167702614560746] [Medline: 25984421]
41. Bowers W, Stuart S, Macfarlane R, Gorman L. Use of computer-administered cognitive-behavior therapy with depressed inpatients. Depression. 1993;1(6):294-299. [doi: 10.1002/depr.3050010603]

42. Carlbring P, Hägglund M, Luthström A, Dahlin M, Kadowaki Å, Vernmark K, et al. Internet-based behavioral activation and acceptance-based treatment for depression: a randomized controlled trial. J Affect Disord. Jun 2013;148(2-3):331-337. [doi: 10.1016/j.jad.2012.12.020] [Medline: 23357657]
43. Celano CM, Beale EE, Mastromauro CA, Stewart JG, Millstein RA, Auerbach RP, et al. Psychological interventions to reduce suicidality in high-risk patients with major depression: a randomized controlled trial. Psychol Med. Apr 2017;47(5):810-821. [FREE Full text] [doi: 10.1017/S0033291716002798] [Medline: 27876105]
44. Choi I, Zou J, Titov N, Dear BF, Li S, Johnston L, et al. Culturally attuned internet treatment for depression amongst Chinese Australians: a randomised controlled trial. J Affect Disord. Feb 2012;136(3):459-468. [doi: 10.1016/j.jad.2011.11.003] [Medline: 22177742]
45. Choi NG, Marti CN, Bruce ML, Hegel MT, Wilson NL, Kunik ME. Six-month postintervention depression and disability outcomes of in-home telehealth problem-solving therapy for depressed, low-income homebound older adults. Depress Anxiety. Aug 2014;31(8):653-661. [FREE Full text] [doi: 10.1002/da.22242] [Medline: 24501015]
46. Corruble E, Swartz HA, Bottai T, Vaiva G, Bayle F, Llorca PM, et al. Telephone-administered psychotherapy in combination with antidepressant medication for the acute treatment of major depressive disorder. J Affect Disord. Jan 15, 2016;190:6-11. [doi: 10.1016/j.jad.2015.07.052] [Medline: 26480205]
47. Egede LE, Acierno R, Knapp RG, Lejuez C, Hernandez-Tejada M, Payne EH, et al. Psychotherapy for depression in older veterans via telemedicine: a randomised, open-label, non-inferiority trial. Lancet Psychiatry. Aug 2015;2(8):693-701. [doi: 10.1016/S2215-0366(15)00122-4] [Medline: 26249300]
48. Forand NR, Barnett JG, Strunk DR, Hindiyeh MU, Feinberg JE, Keefe JR. Efficacy of guided iCBT for depression and mediation of change by cognitive skill acquisition. Behav Ther. Mar 2018;49(2):295-307. [FREE Full text] [doi: 10.1016/j.beth.2017.04.004] [Medline: 29530267]
49. Forsell E, Bendix M, Holländare F, Szymanska von Schultz B, Nasiell J, Blomdahl-Wetterholm M, et al. Internet delivered cognitive behavior therapy for antenatal depression: a randomised controlled trial. J Affect Disord. Oct 15, 2017;221:56-64. [FREE Full text] [doi: 10.1016/j.jad.2017.06.013] [Medline: 28628768]
50. Gilbody S, Littlewood E, Hewitt C, Brierley G, Tharmanathan P, Araya R. Computerised cognitive behaviour therapy (cCBT) as treatment for depression in primary care (REEACT trial): large scale pragmatic randomised controlled trial. Br Med J. Jan 12, 2016;352:i195. [FREE Full text] [doi: 10.1136/bmj.i195] [Medline: 26759375]
51. de Graaf LE, Gerhards SA, Arntz A, Riper H, Metsemakers JF, Evers SM, et al. Clinical effectiveness of online computerised cognitive-behavioural therapy without support for depression in primary care: randomised trial. Br J Psychiatry. Jul 2009;195(1):73-80. [doi: 10.1192/bjp.bp.108.054429] [Medline: 19567900]
52. Hunkeler EM, Hargreaves WA, Fireman B, Terdiman J, Meresman JF, Porterfield Y, et al. A web-delivered care management and patient self-management program for recurrent depression: a randomized trial. Psychiatr Serv. Nov 2012;63(11):1063-1071. [doi: 10.1176/appi.ps.005332011] [Medline: 22983558]
53. Johansson R, Ekbladh S, Hebert A, Lindström M, Möller S, Petitt E, et al. Psychodynamic guided self-help for adult depression through the internet: a randomised controlled trial. PLoS One. 2012;7(5):e38021. [FREE Full text] [doi: 10.1371/journal.pone.0038021] [Medline: 22741027]
54. Johansson R, Sjöberg E, Sjögren M, Johnsson E, Carlbring P, Andersson T, et al. Tailored vs standardized internet-based cognitive behavior therapy for depression and comorbid symptoms: a randomized controlled trial. PLoS One. 2012;7(5):e36905. [FREE Full text] [doi: 10.1371/journal.pone.0036905] [Medline: 22615841]
55. Johansson R, Björklund M, Hornborg C, Karlsson S, Hesser H, Ljótsson B, et al. Affect-focused psychodynamic psychotherapy for depression and anxiety through the internet: a randomized controlled trial. PeerJ. 2013;1:e102. [FREE Full text] [doi: 10.7717/peerj.102] [Medline: 23862104]
56. Kessler D, Lewis G, Kaur S, Wiles N, King M, Weich S, et al. Therapist-delivered Internet psychotherapy for depression in primary care: a randomised controlled trial. Lancet. Aug 22, 2009;374(9690):628-634. [doi: 10.1016/S0140-6736(09)61257-5] [Medline: 19700005]
57. Kivi M, Eriksson MC, Hange D, Petersson EL, Vernmark K, Johansson B, et al. Internet-based therapy for mild to moderate depression in Swedish primary care: short term results from the PRIM-NET randomized controlled trial. Cogn Behav Ther. 2014;43(4):289-298. [FREE Full text] [doi: 10.1080/16506073.2014.921834] [Medline: 24911260]
58. Hirsch CR, Krahé C, Whyte J, Loizou S, Bridge L, Norton S, et al. Interpretation training to target repetitive negative thinking in generalized anxiety disorder and depression. J Consult Clin Psychol. Dec 2018;86(12):1017-1030. [doi: 10.1037/ccp0000310] [Medline: 30507227]
59. Lam RW, Parikh SV, Ramasubbu R, Michalak EE, Tam EM, Axler A, et al. Effects of combined pharmacotherapy and psychotherapy for improving work functioning in major depressive disorder. Br J Psychiatry. Nov 2013;203(5):358-365. [doi: 10.1192/bjp.bp.112.125237] [Medline: 24029535]
60. Lang TJ, Blackwell SE, Harmer CJ, Davison P, Holmes EA. Cognitive bias modification using mental imagery for depression: developing a novel computerized intervention to change negative thinking styles. Eur J Pers. Mar 2012;26(2):145-157. [FREE Full text] [doi: 10.1002/per.855] [Medline: 23316101]

61. Lappalainen P, Langrial S, Oinas-Kukkonen H, Tolvanen A, Lappalainen R. Web-based acceptance and commitment therapy for depressive symptoms with minimal support: a randomized controlled trial. Behav Modif. Nov 2015;39(6):805-834. [doi: 10.1177/0145445515598142] [Medline: 26253644]
62. Lindner P, Olsson E, Johnsson A, Dahlin M, Andersson G, Carlbring P. The impact of telephone versus e-mail therapist guidance on treatment outcomes, therapeutic alliance and treatment engagement in Internet-delivered CBT for depression: A randomised pilot trial. Internet Interventions. Oct 2014;1(4):182-187. [doi: 10.1016/j.invent.2014.09.001]
63. Löbner M, Pabst A, Stein J, Dorow M, Matschinger H, Luppa M, et al. Computerized cognitive behavior therapy for patients with mild to moderately severe depression in primary care: A pragmatic cluster randomized controlled trial (@ktiv). J Affect Disord. Oct 01, 2018;238:317-326. [doi: 10.1016/j.jad.2018.06.008] [Medline: 29902736]
64. Luxton DD, Pruitt LD, Wagner A, Smolenski DJ, Jenkins-Guarnieri MA, Gahm G. Home-based telebehavioral health for U.S. military personnel and veterans with depression: A randomized controlled trial. J Consult Clin Psychol. Nov 2016;84(11):923-934. [doi: 10.1037/ccp0000135] [Medline: 27599225]
65. Ly KH, Trüschel A, Jarl L, Magnusson S, Windahl T, Johansson R, et al. Behavioural activation versus mindfulness-based guided self-help treatment administered through a smartphone application: a randomised controlled trial. BMJ Open. Jan 09, 2014;4(1):e003440. [FREE Full text] [doi: 10.1136/bmjopen-2013-003440] [Medline: 24413342]
66. Ly KH, Topooco N, Cederlund H, Wallin A, Bergström J, Molander O, et al. Smartphone-supported versus full behavioural activation for depression: a randomised controlled trial. PLoS One. 2015;10(5):e0126559. [FREE Full text] [doi: 10.1371/journal.pone.0126559] [Medline: 26010890]
67. Mantani A, Kato T, Furukawa TA, Horikoshi M, Imai H, Hiroe T, et al. Smartphone cognitive behavioral therapy as an adjunct to pharmacotherapy for refractory depression: randomized controlled trial. J Med Internet Res. Nov 03, 2017;19(11):e373. [FREE Full text] [doi: 10.2196/jmir.8602] [Medline: 29101095]
68. Meyer B, Bierbrodt J, Schröder J, Berger T, Beevers C, Weiss M, et al. Effects of an internet intervention (Deprexis) on severe depression symptoms: randomized controlled trial. Internet Interventions. Mar 2015;2(1):48-59. [doi: 10.1016/j.invent.2014.12.003]
69. Milgrom J, Danaher BG, Gemmill AW, Holt C, Holt CJ, Seeley JR, et al. Internet cognitive behavioral therapy for women with postnatal depression: a randomized controlled trial of MumMoodBooster. J Med Internet Res. Mar 07, 2016;18(3):e54. [FREE Full text] [doi: 10.2196/jmir.4993] [Medline: 26952645]
70. Mohr DC, Carmody T, Erickson L, Jin L, Leader J. Telephone-administered cognitive behavioral therapy for veterans served by community-based outpatient clinics. J Consult Clin Psychol. Apr 2011;79(2):261-265. [doi: 10.1037/a0022395] [Medline: 21299274]
71. Mohr DC, Ho J, Duffecy J, Reifler D, Sokol L, Burns MN, et al. Effect of telephone-administered vs face-to-face cognitive behavioral therapy on adherence to therapy and depression outcomes among primary care patients: a randomized trial. J Am Med Assoc. Jun 06, 2012;307(21):2278-2285. [FREE Full text] [doi: 10.1001/jama.2012.5588] [Medline: 22706833]
72. Mohr DC, Duffecy J, Ho J, Kwasny M, Cai X, Burns MN, et al. A randomized controlled trial evaluating a manualized TeleCoaching protocol for improving adherence to a web-based intervention for the treatment of depression. PLoS One. 2013;8(8):e70086. [FREE Full text] [doi: 10.1371/journal.pone.0070086] [Medline: 23990896]
73. Montero-Marín J, Araya R, Pérez-Yus MC, Mayoral F, Gili M, Botella C, et al. An internet-based intervention for depression in primary care in Spain: a randomized controlled trial. J Med Internet Res. Aug 26, 2016;18(8):e231. [FREE Full text] [doi: 10.2196/jmir.5695] [Medline: 27565118]
74. Nakao S, Nakagawa A, Oguchi Y, Mitsuda D, Kato N, Nakagawa Y, et al. Web-based cognitive behavioral therapy blended with face-to-face sessions for major depression: randomized controlled trial. J Med Internet Res. Sep 21, 2018;20(9):e10743. [FREE Full text] [doi: 10.2196/10743] [Medline: 30249583]
75. Nyström MB, Stenling A, Sjöström E, Neely G, Lindner P, Hassmén P, et al. Behavioral activation versus physical activity via the internet: a randomized controlled trial. J Affect Disord. Jun 2017;215:85-93. [FREE Full text] [doi: 10.1016/j.jad.2017.03.018] [Medline: 28319696]
76. O'Mahen HA, Richards DA, Woodford J, Wilkinson E, McGinley J, Taylor RS, et al. Netmums: a phase II randomized controlled trial of a guided Internet behavioural activation treatment for postpartum depression. Psychol Med. Jun 2014;44(8):1675-1689. [FREE Full text] [doi: 10.1017/S0033291713002092] [Medline: 24148703]
77. Reins JA, Boß L, Lehr D, Berking M, Ebert DD. The more I got, the less I need? Efficacy of Internet-based guided self-help compared to online psychoeducation for major depressive disorder. J Affect Disord. Mar 01, 2019;246:695-705. [doi: 10.1016/j.jad.2018.12.065] [Medline: 30611913]
78. Ren Z, Li X, Zhao L, Yu X, Li Z, Lai L, et al. Effectiveness and mechanism of internet-based self-help intervention for depression: the Chinese version of MoodGYM. Acta Psychologica Sinica. 2016;48(7):818. [doi: 10.3724/SP.J.1041.2016.00818]
79. Richards DA, Hill JJ, Gask L, Lovell K, Chew-Graham C, Bower P, et al. Clinical effectiveness of collaborative care for depression in UK primary care (CADET): cluster randomised controlled trial. BMJ. Aug 19, 2013;347:f4913. [FREE Full text] [doi: 10.1136/bmj.f4913] [Medline: 23959152]

80. Rollman BL, Herbeck Belnap B, Abebe KZ, Spring MB, Rotondi AJ, Rothenberger SD, et al. Effectiveness of online collaborative care for treating mood and anxiety disorders in primary care: a randomized clinical trial. JAMA Psychiatry. Jan 01, 2018;75(1):56-64. [FREE Full text] [doi: 10.1001/jamapsychiatry.2017.3379] [Medline: 29117275]
81. Rosso IM, Killgore WD, Olson EA, Webb CA, Fukunaga R, Auerbach RP, et al. Internet-based cognitive behavior therapy for major depressive disorder: a randomized controlled trial. Depress Anxiety. Mar 2017;34(3):236-245. [FREE Full text] [doi: 10.1002/da.22590] [Medline: 28009467]
82. Sandoval LR, Buckey JC, Ainslie R, Tombari M, Stone W, Hegel MT. Randomized controlled trial of a computerized interactive media-based problem solving treatment for depression. Behav Ther. May 2017;48(3):413-425. [FREE Full text] [doi: 10.1016/j.beth.2016.04.001] [Medline: 28390503]
83. Schuver KJ, Lewis BA. Mindfulness-based yoga intervention for women with depression. Complement Ther Med. Jun 2016;26:85-91. [doi: 10.1016/j.ctim.2016.03.003] [Medline: 27261987]
84. Selmi PM, Klein MH, Greist JH, Sorrell SP, Erdman HP. Computer-administered cognitive-behavioral therapy for depression. Am J Psychiatry. Jan 1990;147(1):51-56. [doi: 10.1176/ajp.147.1.51] [Medline: 2403473]
85. Smith J, Newby JM, Burston N, Murphy MJ, Michael S, Mackenzie A, et al. Help from home for depression: a randomised controlled trial comparing internet-delivered cognitive behaviour therapy with bibliotherapy for depression. Internet Interv. Sep 2017;9:25-37. [FREE Full text] [doi: 10.1016/j.invent.2017.05.001] [Medline: 30135834]
86. Thase ME, Wright JH, Eells TD, Barrett MS, Wisniewski SR, Balasubramani GK, et al. Improving the efficiency of psychotherapy for depression: computer-assisted versus standard CBT. Am J Psychiatry. Mar 01, 2018;175(3):242-250. [FREE Full text] [doi: 10.1176/appi.ajp.2017.17010089] [Medline: 28969439]
87. Titov N, Andrews G, Davies M, McIntyre K, Robinson E, Solley K. Internet treatment for depression: a randomized controlled trial comparing clinician vs. technician assistance. PLoS One. Jun 08, 2010;5(6):e10939. [FREE Full text] [doi: 10.1371/journal.pone.0010939] [Medline: 20544030]
88. Titov N, Dear BF, Schwencke G, Andrews G, Johnston L, Craske MG, et al. Transdiagnostic internet treatment for anxiety and depression: a randomised controlled trial. Behav Res Ther. Aug 2011;49(8):441-452. [doi: 10.1016/j.brat.2011.03.007] [Medline: 21679925]
89. Torkan H, Blackwell SE, Holmes EA, Kalantari M, Neshat-Doost HT, Maroufi M, et al. Positive imagery cognitive bias modification in treatment-seeking patients with major depression in iran: a pilot study. Cognit Ther Res. 2014;38:132-145. [FREE Full text] [doi: 10.1007/s10608-014-9598-8] [Medline: 24634554]
90. Vernmark K, Lenndin J, Bjärehed J, Carlsson M, Karlsson J, Oberg J, et al. Internet administered guided self-help versus individualized e-mail therapy: a randomized trial of two versions of CBT for major depression. Behav Res Ther. May 2010;48(5):368-376. [doi: 10.1016/j.brat.2010.01.005] [Medline: 20152960]
91. Watkins ER, Taylor RS, Byng R, Baeyens C, Read R, Pearson K, et al. Guided self-help concreteness training as an intervention for major depression in primary care: a Phase II randomized controlled trial. Psychol Med. Jul 2012;42(7):1359-1371. [FREE Full text] [doi: 10.1017/S0033291711002480] [Medline: 22085757]
92. Watts S, Mackenzie A, Thomas C, Griskaitis A, Mewton L, Williams A, et al. CBT for depression: a pilot RCT comparing mobile phone vs. computer. BMC Psychiatry. Feb 07, 2013;13:49. [FREE Full text] [doi: 10.1186/1471-244X-13-49] [Medline: 23391304]
93. Williams AD, Blackwell SE, Mackenzie A, Holmes EA, Andrews G. Combining imagination and reason in the treatment of depression: a randomized controlled trial of internet-based cognitive-bias modification and internet-CBT for depression. J Consult Clin Psychol. Oct 2013;81(5):793-799. [FREE Full text] [doi: 10.1037/a0033247] [Medline: 23750459]
94. Williams AD, O'Moore K, Blackwell SE, Smith J, Holmes EA, Andrews G. Positive imagery cognitive bias modification (CBM) and internet-based cognitive behavioral therapy (iCBT): a randomized controlled trial. J Affect Disord. Jun 01, 2015;178:131-141. [FREE Full text] [doi: 10.1016/j.jad.2015.02.026] [Medline: 25805405]
95. Wright JH, Wright AS, Albano AM, Basco MR, Goldsmith LJ, Raffield T, et al. Computer-assisted cognitive therapy for depression: maintaining efficacy while reducing therapist time. Am J Psychiatry. Jun 2005;162(6):1158-1164. [doi: 10.1176/appi.ajp.162.6.1158] [Medline: 15930065]
96. Zagorscak P, Heinrich M, Sommer D, Wagner B, Knaevelsrud C. Benefits of individualized feedback in internet-based interventions for depression: a randomized controlled trial. Psychother Psychosom. 2018;87(1):32-45. [doi: 10.1159/000481515] [Medline: 29306945]
97. Zwerenz R, Becker J, Knickenberg RJ, Siepmann M, Hagen K, Beutel ME. Online self-help as an add-on to inpatient psychotherapy: efficacy of a new blended treatment approach. Psychother Psychosom. 2017;86(6):341-350. [doi: 10.1159/000481177] [Medline: 29131090]
98. Dennis CL, Grigoriadis S, Zupancic J, Kiss A, Ravitz P. Telephone-based nurse-delivered interpersonal psychotherapy for postpartum depression: nationwide randomised controlled trial. Br J Psychiatry. Apr 2020;216(4):189-196. [doi: 10.1192/bjp.2019.275] [Medline: 32029010]
99. Flygare AL, Engström I, Hasselgren M, Jansson-Fröjmark M, Frejgrim R, Andersson G, et al. Internet-based CBT for patients with depressive disorders in primary and psychiatric care: Is it effective and does comorbidity affect outcome? Internet Interv. Mar 2020;19:100303. [FREE Full text] [doi: 10.1016/j.invent.2019.100303] [Medline: 32055451]

100. Gili M, Castro A, García-Palacios A, Garcia-Campayo J, Mayoral-Cleries F, Botella C, et al. Efficacy of three low-intensity, internet-based psychological interventions for the treatment of depression in primary care: randomized controlled trial. J Med Internet Res. Jun 05, 2020;22(6):e15845. [FREE Full text] [doi: 10.2196/15845] [Medline: 32501276]
101. Hur JW, Kim B, Park D, Choi SW. A scenario-based cognitive behavioral therapy mobile app to reduce dysfunctional beliefs in individuals with depression: a randomized controlled trial. Telemed J E Health. Sep 2018;24(9):710-716. [doi: 10.1089/tmj.2017.0214] [Medline: 29323626]
102. Jannati N, Mazhari S, Ahmadian L, Mirzaee M. Effectiveness of an app-based cognitive behavioral therapy program for postpartum depression in primary care: A randomized controlled trial. Int J Med Inform. Sep 2020;141:104145. [doi: 10.1016/j.ijmedinf.2020.104145] [Medline: 32480319]
103. Kooistra LC, Wiersma JE, Ruwaard J, Neijenhuijs K, Lokkerbol J, van Oppen P, et al. Cost and effectiveness of blended versus standard cognitive behavioral therapy for outpatients with depression in routine specialized mental health care: pilot randomized controlled trial. J Med Internet Res. Oct 29, 2019;21(10):e14261. [FREE Full text] [doi: 10.2196/14261] [Medline: 31663855]
104. Oehler C, Görges F, Rogalla M, Rummel-Kluge C, Hegerl U. Efficacy of a guided web-based self-management intervention for depression or dysthymia: randomized controlled trial with a 12-month follow-up using an active control condition. J Med Internet Res. Jul 14, 2020;22(7):e15361. [FREE Full text] [doi: 10.2196/15361] [Medline: 32673233]
105. Pfeiffer PN, Pope B, Houck M, Benn-Burton W, Zivin K, Ganoczy D, et al. Effectiveness of peer-supported computer-based CBT for depression among veterans in primary care. Psychiatr Serv. Mar 01, 2020;71(3):256-262. [doi: 10.1176/appi.ps.201900283] [Medline: 31931686]
106. Pihlaja S, Lahti J, Lipsanen JO, Ritola V, Gummerus EM, Stenberg JH, et al. Scheduled telephone support for internet cognitive behavioral therapy for depression in patients at risk for dropout: pragmatic randomized controlled trial. J Med Internet Res. Jul 23, 2020;22(7):e15732. [FREE Full text] [doi: 10.2196/15732] [Medline: 32706658]
107. Welch ES, Weigand A, Hooker JE, Philip NS, Tyrka AR, Press DZ, et al. Feasibility of Computerized Cognitive-Behavioral Therapy Combined With Bifrontal Transcranial Direct Current Stimulation for Treatment of Major Depression. Neuromodulation. Dec 2019;22(8):898-903. [doi: 10.1111/ner.12807] [Medline: 30153360]
108. Johansson O, Bjärehed J, Andersson G, Carlbring P, Lundh L-G. Effectiveness of guided internet-delivered cognitive behavior therapy for depression in routine psychiatry: A randomized controlled trial. Internet Interv. Sep 2019;17:100247. [FREE Full text] [doi: 10.1016/j.invent.2019.100247] [Medline: 31249791]
109. Newman MG, Szkodny LE, Llera SJ, Przeworski A. A review of technology-assisted self-help and minimal contact therapies for anxiety and depression: is human contact necessary for therapeutic efficacy? Clin Psychol Rev. Feb 2011;31(1):89-103. [doi: 10.1016/j.cpr.2010.09.008] [Medline: 21130939]
110. Moessner M, Bauer S. E-Mental-Health und internetbasierte psychotherapie. Psychotherapeut. May 5, 2017;62(3):251-266. [doi: 10.1007/s00278-017-0198-4]
111. Hennemann S, Farnsteiner S, Sander L. Internet- and mobile-based aftercare and relapse prevention in mental disorders: a systematic review and recommendations for future research. Internet Interv. Dec 2018;14:1-17. [FREE Full text] [doi: 10.1016/j.invent.2018.09.001] [Medline: 30510909]
112. Grünzig S-D, Bengel J, Göhner W, Krämer LV. [Low-intensity interventions to reduce depressive symptoms before outpatient psychotherapy - a systematic literature review]. Psychother Psychosom Med Psychol. Jun 2019;69(6):212-223. [doi: 10.1055/a-0630-2397]
113. van Straten A, Hill J, Richards DA, Cuijpers P. Stepped care treatment delivery for depression: a systematic review and meta-analysis. Psychol Med. Jan 2015;45(2):231-246. [doi: 10.1017/S0033291714000701] [Medline: 25065653]
114. Schröder J, Berger T, Meyer B, Lutz W, Hautzinger M, Späth C, et al. Attitudes towards internet interventions among psychotherapists and individuals with mild to moderate depression symptoms. Cogn Ther Res. Apr 22, 2017;41(5):745-756. [doi: 10.1007/s10608-017-9850-0]
115. Eichenberg C, Hübner L. [Psychoanalyse via internet]. Psychotherapeut. Jul 2, 2018;63(4):283-290. [doi: 10.1007/s00278-018-0294-0]
116. Flückiger C, Del Re AC, Wampold BE, Horvath AO. The alliance in adult psychotherapy: a meta-analytic synthesis. Psychotherapy (Chic). Dec 2018;55(4):316-340. [doi: 10.1037/pst0000172] [Medline: 29792475]
117. Wehmann E, Köhnen M, Härter M, Liebherz S. Therapeutic alliance in technology-based interventions for the treatment of depression: systematic review. J Med Internet Res. Jun 11, 2020;22(6):e17195. [FREE Full text] [doi: 10.2196/17195] [Medline: 32525484]
118. Ebert DD, Baumeister H. Internet-und mobilbasierte Interventionen in der Psychotherapie: Ein Überblick. Psychotherapeutenjournal. 2016;1(2016):22-31. [FREE Full text]
119. Johansson R, Nyblom A, Carlbring P, Cuijpers P, Andersson G. Choosing between internet-based psychodynamic versus cognitive behavioral therapy for depression: a pilot preference study. BMC Psychiatry. Oct 18, 2013;13:268. [FREE Full text] [doi: 10.1186/1471-244X-13-268] [Medline: 24139066]
120. Swift JK, Callahan JL. The impact of client treatment preferences on outcome: a meta-analysis. J Clin Psychol. Apr 2009;65(4):368-381. [doi: 10.1002/jclp.20553] [Medline: 19226606]

121. Perez-Lloret S, Rey MV, Fabre N, Ory F, Spampinato U, Montastruc J, et al. Do Parkinson's disease patients disclose their adverse events spontaneously? Eur J Clin Pharmacol. May 2012;68(5):857-865. [doi: 10.1007/s00228-011-1198-x] [Medline: 22205275]
122. Wernicke JF, Faries D, Milton D, Weyrauch K. Detecting treatment emergent adverse events in clinical trials: a comparison of spontaneously reported and solicited collection methods. Drug Saf. 2005;28(11):1057-1063. [doi: 10.2165/00002018-200528110-00006] [Medline: 16231957]
123. Meister R, von Wolff A, Mohr H, Nestoriuc Y, Härter M, Hölzel L, et al. Adverse event methods were heterogeneous and insufficiently reported in randomized trials on persistent depressive disorder. J Clin Epidemiol. Mar 2016;71:97-108. [doi: 10.1016/j.jclinepi.2015.10.007] [Medline: 26482955]
124. Shamseer L, Hopewell S, Altman DG, Moher D, Schulz KF. Update on the endorsement of CONSORT by high impact factor journals: a survey of journal. Trials. Jun 24, 2016;17(1):301. [FREE Full text] [doi: 10.1186/s13063-016-1408-z] [Medline: 27343072]
125. Turner L, Shamseer L, Altman DG, Weeks L, Peters J, Kober T, et al. Consolidated standards of reporting trials (CONSORT) and the completeness of reporting of randomised controlled trials (RCTs) published in medical journals. Cochrane Database Syst Rev. Nov 14, 2012;11. [FREE Full text] [doi: 10.1002/14651858.MR000030.pub2] [Medline: 23152285]
126. Ioannidis JPA, Evans SJ, Gøtzsche PC, O'Neill RT, Altman DG, Schulz K, et al. CONSORT Group. Better reporting of harms in randomized trials: an extension of the CONSORT statement. Ann Intern Med. Nov 16, 2004;141(10):781-788. [Medline: 15545678]
127. Pilkington K, Boshnakova A, Clarke M, Richardson J. 'No language restrictions' in database searches: what does this really mean? J Altern Complement Med. Feb 2005;11(1):205-207. [doi: 10.1089/acm.2005.11.205] [Medline: 15750383]

Abbreviations

CBT: cognitive behavioral therapy
cCBT: computerized cognitive behavioral therapy
CENTRAL: Cochrane Central Register of Controlled Trials
CONSORT: Consolidated Standards of Reporting Trials
F2F: face-to-face
iCBT: internet-based CBT
PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses
RCT: randomized controlled trial
TBI: technology-based psychological intervention

Edited by J Torous; submitted 24.06.20; peer-reviewed by EC-Y Su, R Schuster; comments to author 26.08.20; revised version received 30.10.20; accepted 18.11.20; published 10.02.21

Please cite as:
Köhnen M, Dreier M, Seeralan T, Kriston L, Härter M, Baumeister H, Liebherz S
Evidence on Technology-Based Psychological Interventions in Diagnosed Depression: Systematic Review
JMIR Ment Health 2021;8(2):e21700
URL: https://mental.jmir.org/2021/2/e21700
doi: 10.2196/21700
PMID: 33565981