Implementing internet delivered cognitive behavioural therapy for depression and anxiety in adults: A systematic review

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Abstract

Background: Scientific implementation findings relevant to the implementation of iCBT for depression and anxiety remains sparse. Identifying evidence-based factors that influence the implementation of iCBT is key to successfully employing iCBT in the real world clinical settings.

Objective: Two domains of inquiry guided this systematic review, centring on 1) aspects that research articles postulate as important for the implementation of iCBT and 2) aspects relevant to the day-to-day running of iCBT services. A mixed methods systematic review, utilising a convergent synthesis design, was conducted to investigate the implementation of internet-delivered cognitive behavioural therapy (iCBT) for depression and anxiety in adults.

Methods: Forty (N=40) articles were identified as eligible for mixed-methods review. Data were analysed qualitatively using the descriptive-interpretive approach.

Results: The first domain highlighted the impact of therapist and patient attitudes when implementing iCBT, the superiority of guided iCBT over unguided, its non-inferiority to equivalent face-to-face treatments, and its utility outside of the original target of mild-moderate depression and/or anxiety. Three sub-domains were identified under domain two; 1) the management of iCBT in the workplace, detailing the importance of managing the iCBT service, related staff and their motivations around using it 2) the practice of iCBT in the workplace, describing the therapeutic aspects of iCBT provision such as the provision of support, the background of supporters and screening procedures, 3) contextual considerations, detailing the impact of governmental legislation on therapy conduced over the internet, the lack of an iCBT workforce as a limiting factor and the costings associated with iCBT provision.

Conclusions: Broadly, the findings describe several aspects that should be taken to account when researchers or practitioners implement iCBT as part of their work. However, the findings should be interpreted with caution; few of the included studies were focused on evaluating the implementation of iCBT, highlighting the need for more implementation-specific research in this area.

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Implementing internet delivered cognitive behavioural therapy for depression and anxiety in adults: A systematic review

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Abstract

Background: Scientific implementation findings relevant to the implementation of iCBT for depression and anxiety in adults remains sparse and scattered across different sources of published information. Identifying evidence-based factors that influence the implementation of iCBT is key to successfully employing iCBT in the real-world clinical settings.

Objective: Two domains of inquiry guided this systematic review, centring on 1) aspects that research articles postulate as important for the implementation of iCBT and 2) aspects relevant to the day-to-day running of iCBT services. A mixed-methods systematic review utilising a convergent synthesis design was conducted to bring together evidence across this sparse literature consisting of divergent scientific article types to investigate the implementation of internet-delivered cognitive behavioural therapy (iCBT) for depression and anxiety in adults.

Methods: PsycInfo, PsycArticles, MEDLINE, CINAHL Complete and EMBASE were searched for any published peer-reviewed scientific articles that report on implementation of iCBT for depression or anxiety disorders in adults. Forty (N=40) articles spanning the case study, commentary, meta-analysis, mixed-methods study, pilot randomized controlled trial, randomized controlled trial, qualitative study, quantitative study, review, and systematic review article types were identified as eligible for mixed-methods review. Data were analysed qualitatively using the descriptive-interpretive approach.

Results: The first domain highlighted the impact of therapist and patient attitudes when implementing iCBT, the superiority of guided iCBT over unguided, its non-inferiority to equivalent face-to-face treatments, and its utility outside of the original target of mild-moderate depression and/or anxiety. Three sub-domains were identified under domain two; 1) the management of iCBT in the workplace, detailing the importance of managing the iCBT service, related staff and their motivations around using it 2) the practice of iCBT in the workplace, describing the therapeutic

aspects of iCBT provision such as the provision of support, the background of supporters and screening procedures, 3) contextual considerations, detailing the impact of governmental legislation on therapy conducted over the internet, the lack of an iCBT workforce as a limiting factor and the costings associated with iCBT provision.

Conclusions: Broadly, the findings describe several aspects that should be taken to account when researchers or practitioners implement iCBT as part of their work. However, the findings should be interpreted with caution as articles reviewed spanned many article types and few of the included studies were directly focused on evaluating the implementation of iCBT. While findings provide insight into important factors to consider during iCBT implementation, these findings and their limitations highlight the need for more implementation-specific research in this area.

Keywords

Mixed-methods systematic review; internet-delivered cognitive behavioural therapy; iCBT; implementation science; implementation research; depression; anxiety

Introduction

Internet-delivered cognitive behavioural therapy (iCBT) for depression and anxiety has been developed to help increase access to evidence-based therapies. There is empirical support for its use

in treating depression and anxiety.[1–4] End-users experience them positively [5] and find them to be satisfactory and acceptable.[1,6,7] However, disseminating iCBT at scale remains a challenge[8,9] and COVID-19 has brought its relevance to light now more so than ever.[10–12] A 2019 commentary[13] discussed the evidence to practice gap in digital mental health treatments. The authors postulate that the reason for this gap is a lack of knowledge in the field of iCBT around implementing interventions within routine care. They suggest the adoption of implementation science methodologies to bridge this evidence-to-practice gap.

Implementation Science has been defined as "*the scientific study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine practice, and hence, to improve the quality and effectiveness of health services and care."*[14] Central to this definition is the problem statement behind it: it takes almost 17 years for healthcare research to achieve its intended benefit, which is termed as the "evidence to practice gap."[15,16] As a newly emerging academic field, implementation science is largely integrative; it borrows and adapts theories from multiple fields and uses these to understand the determinant mechanisms as to why (or why not) a specific implementation succeeds.[17] Implementation science theories provide a frame that allows for implementation plans to be developed and relevant outcomes measured[18], and it has been posited that utilising these methodologies within future studies of iCBT could generate learnings relevant to its real-world application.[13,19,20]

In a recent review focussing on determinants of implementation for E-health interventions, [8] 37 determinants associated with successful implementation were identified. However, to be noted is that "E-Health interventions" in this case contained a wide variety of digitally enabled interventions, including iCBT and psychotherapy delivered via videoconferencing. When comparing iCBT and other E-Health interventions, 'complexity' is a factor for consideration; that is, the degree to which an intervention contains multiple components which require interaction from many individuals, from various levels within an organisation to enact the intervention effectively.[21]

iCBT's level of complexity is highlighted in service illustration papers by Titov et al [22,23]; for example, therapists skillset to operate iCBT efficiently (technical knowledge, constructing written messages), revised services delivery pathways, adherence to regulatory frameworks and newly aligned clinical governance procedures, are some elements of how delivering iCBT may differ from more traditional or less complex services. Conversely, although administering psychological therapy through videoconferencing software may require some altering of specific therapeutic skills and technical upskilling,[24] relative complexity across other areas may be lower (e.g. referral pathways, wider system integration). Similarly, some authors have illustrated the need for both iCBT[25,26] and telehealth-specific competency frameworks,[27] further illustrating the need for specialised skills to extend the traditional therapist skillset

Attempts to mobilise implementation science information on e-health interventions generally to a point of having pragmatic, clinical relevance for iCBT has been sparse.[28] As a consequence, the availability of implementation findings relevant to iCBT remains low. The current study is a mixed-methods systematic review that aimed to account for literature that specifically references or can inform factors relevant to the implementation of iCBT, specifically for depression and anxiety treatment in adults. The benefit of a mixed-methods systematic review over traditional systematic literature reviewing is that it seeks to extract relevant information across qualitative, quantitative, review and illustration-based papers. Mixed-methods synthesis affords a way to effectively capture this information and synthesise it qualitatively to produce relevant insights into the implementation of iCBT. A convergent integrated approach to the mixed-methods review, was therefore chosen due to its appropriateness over other review methods to the subject; a traditional systematic review on the implementation of iCBT for depression and anxiety would not be appropriate due to their being insufficient qualitative and/or quantitative findings to generate insights.[29] Further, there are no restrictions imposed on the type of evidence included within the synthesis, which aligns with the anticipated variety of papers that would be identified.[30] The disorder domains of depression and

anxiety were chosen due to them being the most substantive areas of research for iCBT.

An mixed-methods systematic review departs from and complements previous work in the following ways.[8] Firstly, it will specifically focus on iCBT-based interventions, which can be considered relatively 'complex' in their administration.[21] Second, it will provide a rich description of the current 'practice behind the science' by focussing on reportage within method, results and discussion sections of papers. Third, it will contribute to the existent literature regarding specific implementation strategies that are associated with the use of iCBT.[31] Lastly, it will allow for the interpretation of research findings in a way that will hopefully be productive for future implementations specific to iCBT for treatment of depression and anxiety.

Review Objective

The overarching objective of the review was centred on the pragmatic question of "*what can we learn from published peer-reviewed literature about the implementation of iCBT for depression and anxiety*?" This objective was further broken down into two domains of focus, on which data extraction and subsequent data analysis was based (see methods):

- The first domain was centred on *implementation insights derived from iCBT research*. This objective and domain centres on understanding the novel information that is often presented in published research, and how this information can have relevance and be mobilised for the benefit of iCBT implementation.
- The second domain was *implementation process considerations for the successful implementation of iCBT*, consisted of establishing the strategies that are used within the literature to facilitate the implementation of iCBT. According to implementation science literature, implementation strategies are methods utilised to facilitate the implementation of an intervention, where strategies can consist of training packages, management approaches, developing protocols for intervention use, etc.[31,32]

Method

Design

Because implementation science information on e-health interventions that has pragmatic, clinical relevance for iCBT has been sparse and scattered across different article types, a mixed-methods systematic review was conducted. This mixed-methods systematic review utilized a convergent integrated approach and was conducted to identify literature that was central to the review objective above.[30,33,34] The convergent integrated approach to conducting a mixed-methods systematic review consists of 'qualitising' numerical or statistical findings; that is, quantitative findings are extracted and allocated textual descriptions to allow for integration and simultaneous synthesis with other qualitative data. The resulting qualitative data were then analysed using the descriptive-interpretive approach.[35] This review was not registered and a review protocol was not prepared.

Search Strategy

The general search strategy used: ('ICBT' OR 'CCBT' OR 'internet-delivered CBT' OR 'internet-delivered cognitive behavioural therapy' OR 'internet-delivered cognitive behaviour therapy' OR 'internet-based cognitive behaviour therapy' OR 'internet-based cognitive behavioural therapy' OR 'internet-administered cognitive behaviour therapy' OR 'internet-administered cognitive behavioural therapy' OR 'internet-supported cognitive behaviour therapy' OR 'internet-supported cognitive behavioural therapy') AND ('Anx*' OR 'depress*' OR 'low mood' OR 'GAD' OR 'phobia' OR 'SAD') AND 'Implement*'. Databases searched included PsycInfo, PsycArticles, MEDLINE, CINAHL Complete and EMBASE. A full description of terms and derivatives for the different databases is included in Appendix 1. Databases searched included PsycInfo, PsycArticles, MEDLINE, CINAHL Complete and EMBASE. Search engine limitations required that the search date began in 2007. The search was initially conducted in June 2020 (January 1st 2007 – June 1st 2020) and further repeated in September 2021 (June 1st 2020-August 31st 2021) to identify any new

or relevant publications. The PRISMA diagram constructed to illustrate the search findings are illustrated in Figure 1.

Inclusion Criteria

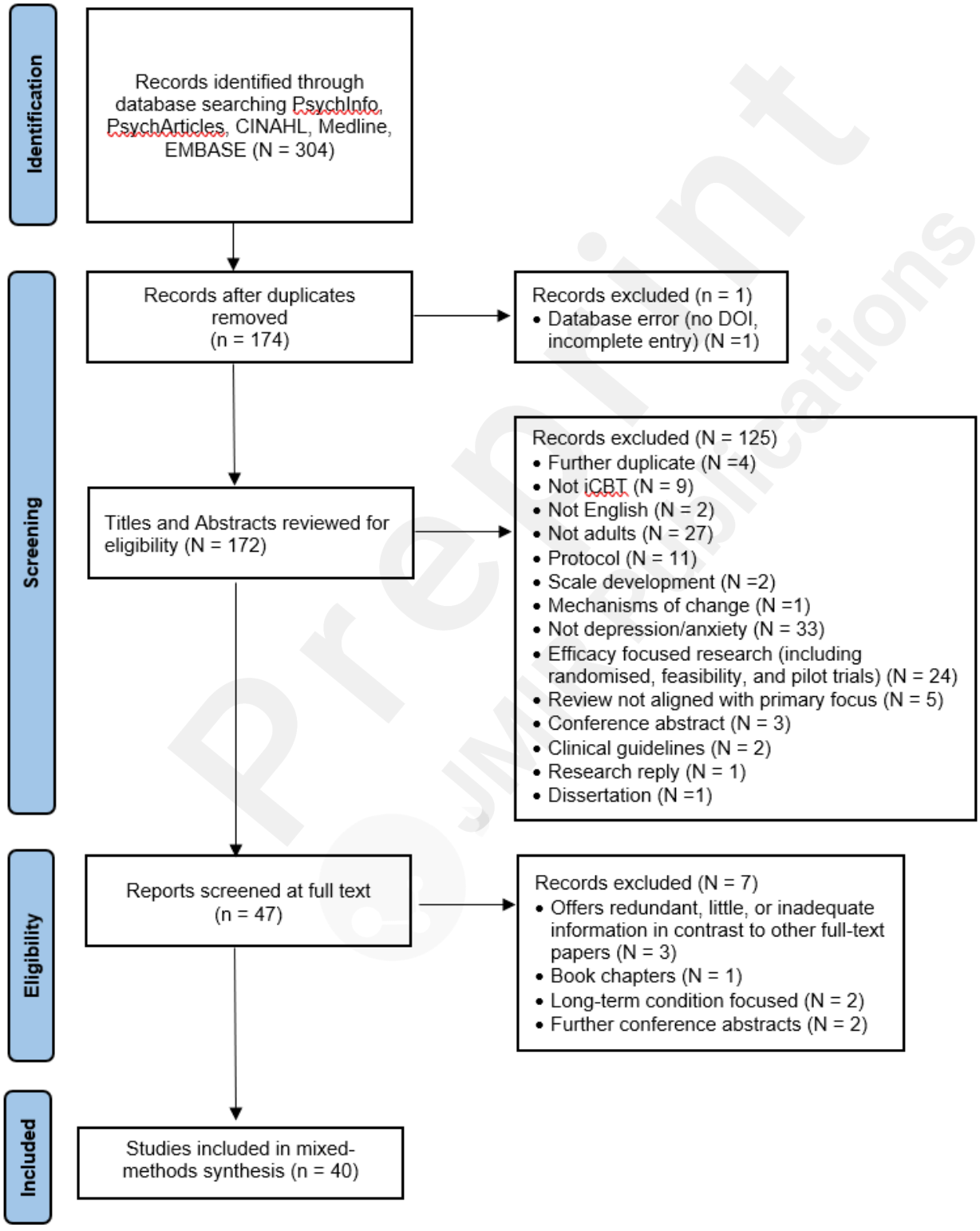
1. Study provides reports on outcomes relate broadly to the domains of interest: 1.) implementation insights derived from iCBT research, and 2.) implementation process considerations for the successful implementation of iCBT.
2. The following study types were included in the review:
    a. Empirical research, encompassing pre-post experimental (e.g. feasibility or randomized controlled trial), case-study, observational or qualitative designs in naturalistic, non-efficacy settings.
    b. Review-type studies, including systematic, meta, umbrella, narrative and scoping reviews
    c. Service-illustration articles that report on the effectiveness of iCBT clinics over time periods, or describe their operating model.
3. Studies targeting adult patient populations, mental healthcare workers (e.g. clinicians, therapists, service managers), or prospective users of iCBT.
4. The study must be conducted in reference to internet-delivered cognitive behavioural therapy (e.g. patients undertaking iCBT, clinicians/therapists or patients reporting on their views of iCBT).
5. The study must be primarily conducted in reference to depression and anxiety disorders (e.g. patients undertaking iCBT for depression and anxiety, clinicians/therapists or patients reporting on their views of iCBT for depression and anxiety).

Exclusion Criteria

Exclusion criteria consisted of the following: 1) Non-peer reviewed research, 2) research not in English language, 3) protocols, 4) dissertations (due to the difficulty in identifying and accessing these at a wide scale), 5) book chapters, 6) conference presentations and abstracts, 7) research with

participants < 18 years of age or 8) studies reporting only on clinical effectiveness data with no information on implementation of iCBT reported on in the study.

Figure 1: *PRISMA diagram for mixed-methods systematic review search*



Screening

This consisted of 2 steps: 1) review at title and review abstract and 2) review at full-paper. It was chosen to review all identified records at title and abstract due to the nature of the current review and wide-range of study types that were anticipated to result from the search. For example, it was noted throughout the reviewing process that papers frequently cited the terms “implementation” or “feasibility” in the title, but failed to provide any relevant information under these constructs when abstracts were reviewed. Where papers provided inadequate information in their abstracts (e.g. “*the results inform the feasibility of implementing iCBT within xyz context*”) to apply the inclusion criteria, DR acted as second reviewer for these abstracts and consulted with DD (primary reviewer) to make a decision on inclusion or exclusion. Once step 1 was completed, all papers were reviewed by DD at full text to discern their relevance to the domains of interest. During this review, papers were rejected at full text for two reasons; 1) incorrect record specification from the databases (e.g. conference presentations being mislabelled) and 2) provided little (e.g. minor comments relating to the implementation of iCBT within “future research” sections) or no information on implementation. Once all papers were screened and the final dataset established, data extraction commenced.

Data Analysis

Meaning Unit Extraction.

Meaning unit extraction began by identifying qualitative meaning units within methodology, results and discussion sections of papers relevant for the study objective, i.e., *learning about the implementation of iCBT for depression and anxiety*. Meaning units are discrete data chunks (either paragraphs or sentences) that contribute standalone meaning towards a particular research question or objective.[36] Throughout the mixed-methods systematic review process, relevant quantitative findings were translated (or ‘qualitised’) to qualitative meaning units. The resulting qualitative meaning units were identified and subsequently extracted to an excel file for purposes of analysis and assigned relevant identifiers. In addition to assigning identifiers, each meaning unit was also

assigned brief, textual summary labels that provided a way to quickly identify the information being conveyed by longer meaning units.

To address the review objective of learning about the implementation of iCBT for depression and anxiety, two main focus areas were identified that allowed for structuring of the relevant data to guide meaning unit extraction.

1) Implementation process considerations for the successful implementation of iCBT: What strategies do papers report on that are related to the process of implementing iCBT (e.g. training clinicians/therapists, screening procedures, referral pathways, service operations)? Do papers report on the impact of these strategies on specific stakeholder groups (e.g. patients, clinicians/therapists)? Do papers acknowledge or cite factors within the context of the implementation (e.g. governmental policy, service infrastructure, funding)?
2) Implementation insights derived from iCBT research: What implications do authors of the included studies cite as important for the future of the implementation of iCBT? How do authors interpret their findings in discussion sections of papers, and can these interpretations have implication for how iCBT is implemented?

Category Generation.

Meaning units within these two focus areas were then further analysed for similarities and clustered together into categories/sub-categories grouping meaning units of similar meaning. The categories/sub-categories were named in order to capture the meaning of the meaning units they contained. The process of organising and naming categories and sub-categories was an on-going activity led by DD and involving feedback from DR and JP. Consensus was agreed through group discussion, where the core component of each sub-category was established (e.g. *"this sub-category describes x"*), and the revised category names were generated based on this shared understanding. As per the descriptive-interpretive approach, it was important that progress was continuously audited through group meetings with DD, DR, JP & LT.

Results

Overview

Forty (N=40) eligible papers published between 2010-2021 were included in the mixed-methods synthesis. Appendix 2 presents the types of articles included in this mixed-methods systematic review and brief summaries of these included articles. Article types included in this review were case study (N = 1), commentary (N = 4), meta-analysis (N = 5), mixed-methods study (N = 3), pilot randomized controlled trial (N = 1), randomized controlled trial (N = 2), qualitative study (N = 5), quantitative study (N = 13), review (N = 3), and systematic review (N = 3). Appendix 3 includes a numbered list of all papers as they are referenced in the results. Note that numbers in parentheses in the results section below refer to the corresponding listed reference in the Appendix 3 systematic review reference list rather than the manuscript reference list.

Domain & Category Structure

Two domains (and lower sub-domains, categories, and sub-categories) were identified: 1.) Implementation insights derived from iCBT research and 2). Implementation processes related to the successful implementation of iCBT in care settings (see tables 1 and 2). Sub-categories are discussed as talking points within each category as opposed to adding further organizational levels within this study.

Table 1

Categories and sub-categories identified under the domain "implementation insights derived from iCBT research" and illustration of the number of contributing papers (out of 40).

Category Sub-Category	*n* papers (out of 40)	*Paper reference number*
Clinician attitudes towards iCBT		
Negative attitudes towards iCBT can impact on referral rates and patient outcome	10	4, 5, 13, 23, 25, 26, 27, 29, 34, 36.
Positive attitudes towards iCBT can increase acceptability and help to grow iCBT in service	3	29, 31, 34

Category Sub-Category	*n* papers (out of 40)	*Paper reference number*
Patient attitudes towards iCBT		
Positive attitudes towards iCBT content, support, privacy and convenience of iCBT can foster engagement	10	3, 8, 27, 29, 32, 33, 36, 37, 38, 40.
Attitudes as moderators of clinical outcome, perceived helpfulness and adherence.	3	18, 36, 38
Negative attitudes relate to preference for face-to-face therapy and issues with utility of iCBT to patient needs	5	25, 26, 36, 37, 38.
The delivery of internet-delivered therapies can be helped by technological and clinical augmentation	7	11, 16, 23, 24, 25, 27, 34.
Specific patient characteristics need to be considered when implementing iCBT		
Age is negatively associated with adherence and clinical outcomes in guided iCBT, and not associated with symptom deterioration in unguided iCBT	4	1, 20, 36, 40
The relationship between gender and adherence is unclear in iCBT overall, but gender is not associated with symptom deterioration in unguided iCBT	2	1, 36
Patient technological literacy is tentatively positively associated with adherence and clinical outcome in iCBT	2	36, 39
Medication and alcohol use is not associated with iCBT adherence	1	36
Minority group membership is negatively associated with adherence to iCBT	1	35
The relationship between adherence and marital status, employment status and education level is mixed overall, but are not associated with symptom deterioration in unguided iCBT	3	1, 36, 40
Having a lower income is positively associated with dropout	1	40
Comorbidity of disorders can moderate treatment outcome	1	40
Making sudden clinical gains is associated with greater improvements at post treatment	1	24
Severity of depression can positively impact on clinical outcomes and adherence	2	10, 36
Symptoms of depression can negatively impact on iCBT adherence	2	12, 18
Chronic mental health problems are negatively associated with iCBT adherence	1	40
Guided iCBT as superior to unguided iCBT in regards to symptom outcomes and adherence.	11	1, 7, 17, 23, 24, 25, 27, 34, 36, 38, 40
iCBT is as effective as face-to-face delivery of the same protocol, yet preference is often for face-to-face treatment	13	6, 11, 13, 14, 16, 23, 24, 25, 27, 29, 36, 37
iCBT appears to be effective beyond the original target of mild-to-moderate depression and anxiety	10	8, 10, 13, 14, 23, 26, 27, 29, 32, 33

Category Sub-Category	*n* papers (out of 40)	*Paper reference number*
Conducting future research that has relevance for iCBT implementation is important		
More implementation research is needed to understand the uptake of iCBT within routine care	9	7, 18, 23, 24, 25, 27, 28, 33, 34
More research is needed on adverse events to understand the negative effects of iCBT	2	19, 23
More research is needed to understand the relationship between adherence and iCBT	4	8, 23, 28, 36

Table 2. Sub-domains, categories, and number of contributing papers identified under the domain "Implementation processes related to the successful implementation of iCBT."

Sub-Domain	Category Sub-Category	n papers (out of 40)	Study reference number
Management of iCBT in the workplace	Successful training of supporters is important for the provision of iCBT	9	4, 14, 16, 22, 26, 29, 31, 34
	Training stakeholders within the health system is important in creating awareness of iCBT	2	14, 29
	Effective management of risk and adverse event management in iCBT is important for its delivery	10	5, 8, 12, 14, 22, 23, 27, 30, 33, 39
	iCBT should be delivered through secure, interoperable systems that facilitate clinician and client access	11	4, 11, 12, 15, 24, 27, 29, 30, 34, 35, 36
	Operational considerations for managing iCBT and related staff are important		
	Effective management and leadership support facilitates implementation	7	12, 14, 22, 24, 29, 31, 34
	Management of workplace resources is required to create time for iCBT to be used by staff	4	4, 26, 29, 31
	Staff motivation to utilise iCBT needs to be fostered	4	26, 29, 27, 34
	Utilization of routine monitoring of iCBT to convey intervention effectiveness and enhance its delivery	5	27, 29, 33, 34, 40
	Effective Marketing and service promotion enhances the uptake of iCBT	6	4, 18, 21, 29, 33, 35
	Staff recruitment and retention in iCBT is a challenge that needs to be mitigated against	2	4, 14
	Scaling of iCBT within services is challenging and requires multiple considerations (e.g. infrastructure, funding, proper testing,	7	4, 12, 14, 15, 22, 33, 40

Sub-Domain	Category Sub-Category	n papers (out of 40)	Study reference number
	governance)		
The practice of iCBT in the workplace	Appropriate referral pathways and management of waiting times are important for the delivery of iCBT	19	2, 4, 9, 12, 14, 18, 20, 21, 22, 23, 27, 30, 31, 32, 33, 35, 38, 39, 40
	Screening and inclusion criteria for accessing iCBT need to be thoroughly defined	21	8, 9, 11, 12, 13, 14, 16, 18, 20, 22, 24, 26, 29, 30, 32, 33, 35, 37, 38, 39, 40
	Considerations of the level of support for patient is crucial in the provision of iCBT		2, 3, 5, 10, 13, 23, 24, 25, 33, 36, 38
	Positive impact of support on patients	11	
	The quality of support impacts the success of iCBT provision	13	8, 12, 16, 22, 23, 24, 27, 29, 30, 34, 36, 38, 40
	Appropriate considerations should be given to the mediums and modalities of support to fit service and user needs	20	2, 8, 11, 12, 13, 16, 21, 22, 23, 24, 25, 27, 26, 30, 32, 33, 34, 35, 38, 40
	The time demand associated with the provision of support needs to fit service and user needs	18	2, 7, 11, 12, 18, 21, 22, 23, 24, 26, 27, 30, 32, 33, 34, 35, 38, 40
	The optimal personal and professional background of the supporter needs to be considered in the provision of iCBT	19	4, 11, 12, 14, 15, 16, 21, 23, 24, 25, 26, 27, 30, 31, 32, 33, 35
Contextual considerations	Governmental and healthcare regulations affect implementation of iCBT	10	4, 12, 13, 14, 15, 24, 29, 31, 33, 34
	Lack of workforce availability for iCBT as a limiting factor in the provision of iCBT	4	27, 5, 31, 34
	Considering the costings associated with iCBT for patients and providers before implementing	11	4, 8, 12, 13, 14, 22, 26, 27, 29, 31, 39

Domain 1: Implementation insights derived from iCBT research

This domain includes categories that contribute to the success of iCBT in either research or

routine practice settings, or further learning to inform it. In what follows, key meaning units are referenced to their corresponding paper number in Appendix 3.

Category 1: Clinician attitudes towards iCBT affect patient outcomes and implementation of iCBT.

Clinician attitudes towards iCBT are mixed (13). Negative attitudes hinder the successful dissemination of iCBT to clients (25). These attitudes consist of scepticism about the effectiveness/quality of iCBT (4, 27), technological limitations of iCBT (23), the inability to generate a therapeutic alliance through this medium (4), preference for face-to-face therapy (5, 34, 36), perceived lower priority of the intervention in the workplace (29) and its highly standardised nature being incompatible with other psychological interventions (25, 29). Such negative attitudes can arise from a lack of iCBT exposure or training (26) and can be transferred to patients and undermine patient outcomes (29). Accordingly, there is a need to engage with these negative attitudes to successfully implement iCBT(29, 34).

In contrast, positive attitudes towards iCBT can increase acceptability and help to grow iCBT in service. Positive attitudes include acknowledging the benefits of iCBT in terms of time efficiency, cost-effectiveness, evidence base, programme design quality, accessibility, and ability to bridge treatment gaps for those on waiting lists (29). Professionals with more experience implementing iCBT regard iCBT more positively in terms of its applicability to service provision (31). Even healthcare professionals with little exposure to iCBT are generally positive and accepting towards iCBT, but have biases around suitability and large knowledge gaps (34).

Category 2: Patient attitudes towards iCBT affect engagement, adherence, and outcomes.

The first subcategory under this larger category relates to patients reporting positive attitudes towards the iCBT treatment, its content, and associated therapist support they receive (3, 29, 32, 33, 36, 38, 40).They also report strong motivations to seek out iCBT (8) and acknowledge advantages in terms of convenience, cost, privacy and self-directed nature (27, 36, 37, 38). A second sub-category

relates to attitudes, where greater positive initial attitudes predict greater symptom reduction and adherence, and improvement/declines in attitudes during treatment predicts better/worse adherence and outcomes (18, 36, 38). The third subcategory relates to negative attitudes, where they can be a barrier to treatment success (26). Such negative patient attitudes include scepticism towards the effectiveness and credibility of iCBT (38, 37) as well as towards motivation and accountability to progress through iCBT (37). There is also a reported preference for face-to-face therapies over iCBT (25, 37, 36, 38). Interestingly, offering iCBT as a waiting list treatment can create "*unfavourable comparisons*" between iCBT and face-to-face therapy, resulting in negative perceptions of iCBT (38).

Category 3: The delivery of iCBT can be augmented by technological and clinical design factors

iCBT has been augmented with novel design elements or treatment strategies in order to understand their utility and benefit. Such elements and strategies include integrating sensors (24), gamification (24), transdiagnostic elements (25, 24, 27), iCBT as an add-on or adjunct to existing care pathways (34, 11, 23), incorporating "persuasive technology" components (24), iCBT use in a blended care model (23, 24, 16) and use as a first-line intervention to promote interest in further mental health care (34).

Category 4: Patient characteristics related to iCBT outcomes

A variety of demographic, medical, technological factors have been implicated to affect iCBT, and are reported in the following sub-categories. There is mixed evidence for age influencing iCBT outcomes wherein null or negative associations have been observed between age and adherence (36, 40) and symptom reduction (20, 1). Mixed results are also reported for gender. Females can have greater or similar iCBT adherence to males (36) and gender was found to be associated with symptom deterioration in unguided iCBT (1). Perceived technological literacy has

been posited to promote adherence (39, 36) and clinical outcomes (39), though evidence is unclear regarding the impact of tech literacy on iCBT outcome (36). One review reported that patient reported medication and alcohol use not associated with iCBT adherence (36). Minority group membership has been negatively associated with adherence to iCBT (35). Both positive and negative associations have been observed for marital status, employment status (1, 36, 40), and education level (36) with adherence. Individuals with both lower income level and a marital status of single were more likely to dropout from iCBT (40). Comorbidity of mental health disorders can reduce effect of iCBT treatment (8). Chronic mental health problems are negatively associated with iCBT adherence (40).

Making sudden, large clinical gains on symptom measures at the start of treatment is associated with greater improvements at post treatment (24). Severity of depression can positively impact on clinical outcomes of depression, e.g. higher pre-treatment severity results in greater effect sizes (10, 36). Symptoms of depression have also been found to negatively impact iCBT adherence, where symptoms like low motivation have been found to be negatively associated with iCBT adherence (12, 18). Chronic mental health problems are further associated with iCBT adherence, where years of living with chronic mental health condition was found to be negatively associated with adherence to iCBT (40).

Category 5: Guided iCBT as superior to unguided iCBT in regards to symptom outcomes and adherence.

Guided iCBT shows superiority over unguided iCBT in terms of adherence and clinical outcomes (27, 7, 17, 23, 24, 25, 34, 36, 40). However, an IPD meta-analysis (1) postulates that the small effects achieved by unguided iCBT are superior to control groups (or no intervention), and can be best utilised when implemented at scale, such as at the public health level. The therapist element of guided iCBT in particular is posited to improve adherence to iCBT (34, 36). Guided iCBT support also fulfils an expressed need to navigate through and explain therapeutic content when patients

encounter difficulties (38).

Category 6: iCBT is as effective as Face-to-Face delivery of the same protocol, yet preference is often for face-to-face treatment.

iCBT produces similar adherence (27, 24) and clinical outcomes (27, 13, 16, 23, 24) to equivalent face-to-face therapy. iCBT has advantages over face-to-face therapy in terms of time efficiency, access rates (29, 24), and its ability to deliver standardized treatment (11, 14). However, patients demonstrate preference for face-to-face treatment over iCBT, which can be a reason for dropout of iCBT (6, 25, 29, 36, 37). In such instances, these preferences for iCBT over face-to-face treatment can be reduced by introducing a time-delay when accessing treatment (6).

Category 7: iCBT appears to be effective beyond the original target of mild to moderate depression and anxiety.

iCBT is not typically offered for severe presentations of depression and anxiety (26), but real-world data illustrates that a large proportion of patients seen by iCBT clinics have symptoms in this range (14). Patients with severe symptoms at baseline can make large clinical gains (27, 8, 10, 23), show comparable adherence rates to less severe patients (27) and, in some cases, produce larger gains than their non-severe counterparts (27). Studies requiring greater treatment-seeking behaviours tend to recruit individuals with higher levels severe symptoms of depression, illustrating the willingness and motivation of this cohort to initiate treatment (23, 27). After treatment initiation, the effect of higher pre-treatment severity on adherence/completion is unclear, with one study positing that higher pre-treatment severity may be associated with lower iCBT completion rates (33). Similarly, those in the subclinical ranges also benefit from iCBT (23, 32). Those with suicidal ideation are also found to benefit from iCBT (13, 23, 27). iCBT may also be applicable to conditions where depression is secondary to the presenting problem (e.g. addiction, trauma, schizophrenia, bipolar; 27, 29)

Category 8: Future research on implementation critical to advancing iCBT.

Several key areas critical to advancing the implementation of iCBT were apparent. First, a plethora of papers stated a lack of research that details the process of implementing iCBT in naturalistic settings, and thus more research is needed to understand and improve iCBT uptake (7, 18, 23, 24, 25, 27, 28, 33, 34). Second, two studies (19, 23) stated that more research is needed regarding adverse events within iCBT and that current reporting of this in studies is poor (23, 19). Third, more research is needed to understand the relationship between adherence and iCBT outcomes (8, 23, 36). Two studies (8, 36) suggested that the definition of "dropout" should not be conceptualised in a binary way because varying dosages of iCBT have been found to produce positive clinical change when less than the intended programme is completed. A further study stated that high rates of dropout observed in iCBT research should similarly be expected for practical implementations (28)

Domain 2: Implementation processes related to the successful implementation of iCBT

This domain includes categories of factors that are important for the successful implementation of iCBT.

Sub-domain 1 – Management of iCBT day-to-day workplace operations

This sub-domain consists of factors important for managing the day-to-day operations of iCBT, with categories pertaining to the training of staff, risk management, marketing and service promotion, IT infrastructure, working with other services and managing the staff who work in the provision of iCBT.

Category– 1 - Successful training of supporters is important for the provision of iCBT.

Effective training of supporters in iCBT requires technical training in the use of the programme (14, 16), developing competencies around computer skills and online written communication (4, 14, 31) and practice providing support to fictional patients (16). Training writing skills (as many iCBTs rely on supporters messaging the patients) should occur prior to patient interactions rather than through

trial and error during their interactions with patients (4). Training supports, including a manual (26, 34), giving clinicians access to training resources (29, 34) and providing them with feedback on their written reviews (16) were considered helpful. One study stated that there are limited opportunities for support training in iCBT (22).

Category 2. Educating stakeholders within the health system is important to create awareness of iCBT. The training and educating of other relevant stakeholders (e.g., non-clinical staff, referral providers and patients) about the benefits of iCBT is important to create awareness of the intervention and its clinical effectiveness (29) and increasing perceived viability of the intervention as a treatment option (14).

Category 3 – Effective management of risk and adverse events in iCBT is important for its delivery. Successfully implemented iCBT has to be supported by a risk monitoring system (e.g. suicidal risk measures) that alerts clinicians to risk (e.g. triggered automated messages) and allows clinicians to act on indicated risk (e.g. clinician contacts identified risk cases) (27, 30, 5, 8, 12, 22, 23, 14, 33, 39).

Category– 4 - iCBT requires secure, interoperable systems that facilitate clinician and client access. Reviewed papers suggest that iCBT interventions should be hosted on secure servers (27, 29, 35), should be optimised to run on a variety of mediums (tablets, desktops, phones) (27), be integrated with larger patient databases (4, 11, 30) and have security standards that adhere to relevant governing bodies (12, 24). Internet connection difficulty (15, 34), enabling service computers to access iCBT and its related websites, a lack of integration of iCBT applications with healthcare records (34) and providing patients access to technology to use iCBT have been cited as limiting factors and may contribute to patient dropout (15, 36)

Category 5 – Operational considerations for managing iCBT and related staff are important to successful implementation. This category details operational factors that impact successful implementation of iCBT within clinics or workplaces. First, reviewed papers suggest that

management and leadership is important to implement iCBT (29) and includes activities such as developing guidelines and service procedures (12, 22, 24, 29), change management (14), and planning implementation and engaging stakeholders (29, 34). Additionally, management of workplace resources is required to create time for iCBT to be used by staff. For instance, clinicians with already high-workloads may experience time shortages for administering or reviewing the programme (26, 29). iCBT clinic managers worry about clinicians balancing iCBT and face-to-face work workload (4) and it may be necessary to have a dedicated workforce to support iCBT delivery (31).

Second, staff motivation to utilise iCBT needs to be fostered as motivation to use iCBT is 'essential' (26) because iCBT proponents facilitate the implementation of iCBT (29). However, fostering this motivation and changing the way clinicians practice is difficult (27, 29, 34). One way to foster this motivation may be through routine monitoring of iCBT outcomes which can provide persuasive evidence of intervention effectiveness to stakeholders as well as enhance its delivery. Services in Australia and Canada report that they regularly conduct audits of service effectiveness (27, 33, 40), and such routine monitoring data are used so that staff can evaluate and understand the effectiveness of iCBT in their service (29, 34) and to ensure compliance with treatment manual (33).

Third, effective marketing and service promotion are essential to spread iCBT initiatives (4, 29). Advertisement campaigns (e.g. online and printed media) are frequently successful in recruiting participants for trials and routine care (21, 18, 33, 35), though such marketing campaigns can require a large amount resource (29). Recruitment and retention of therapists in iCBT-related positions is also critical. Clinician recruitment can be an issue as some therapists believe that iCBT limits professional freedom due to its highly structured working requirements and that working conditions are not attractive (4, 14).

Fourth, scaling of iCBT within services is challenging and requires consideration of multiple factors. The physical infrastructure (e.g. internet) must be in place (15), funding need to be procured

(4), service decision-makers must be convinced of the intervention feasibility (4), there needs to be evaluation frameworks for existing and new iCBT programmes (14, 22), and governance frameworks (e.g. clinical, IT, organisational) must be implemented that adhere to the wider legislative context (12). Exploring new service pathways that are developed when considering iCBT services may allow for existing iCBT services to scale their offering (33).One study stated that iCBT services should start with a small offering (e.g. minimally monitored iCBT), and then acquire human and financial resources over time to build out the service (40).

Sub-domain 2: The practice of iCBT in the workplace

Category 1: Appropriate referral pathways are necessary for the delivery of iCBT. Reviewed papers suggest that successful implementation of iCBT requires development of appropriate referral pathways, though there are many different referral strategies. Such pathways include self-referral (30, 4, 12, 14, 20, 22, 33), healthcare provider referral (27, 30, 2, 9, 12, 14, 20, 18, 23, 31, 33, 35, 39), access to pathways through marketing materials (21, 18), contacting patients by email (32), contacting patients on waiting lists for face-to-face services (38), or clients applying through a secure website (40).

Category 2: Screening and inclusion/exclusion criteria for iCBT are wide ranging. Successfully implemented programmes required patients to complete an online (12, 20, 22, 14, 29, 32, 33, 35, 37), in-person (12, 30, 13) or phone screening assessment (24, 33, 35). As part of screening, patients were asked about demographic information, mental health symptoms, commitment to iCBT, treatment history, and level of risk, internet access, and language proficiency (8, 13, 22, 29, 30, 32, 33, 35, 37, 38, 39, 40).

A variety of inclusion/exclusion criteria for accessing iCBT are reported; no severe depression (26, 22, 32, 40), no severe anxiety (32), no chronic/recurrent depression (11), no dementia (11) no past history of psychotic symptoms (29, 33), >18years (8, 12, 32, 33, 35, 39, 40), between the ages of 18-65 (18), diagnosis of disorder via psychiatric interview or exceeding cut-off on

established measure (8, 9, 11, 12, 16, 18, 22, 33), no comorbid substance abuse (8, 12, 18, 9, 33, 35) or use of benzodiazepines (9), no suicide risk (8, 12, 22, 9, 33, 35, 38, 39, 40), no bipolar, psychosis or OCD (8, 12, 18, 9, 35, 38, 40), adequate understanding of programme language (8, 16, 18, 9, 35, 40), no developmental disorders or other cognitive disabilities (38), no comorbidities or nonpsychiatric diseases that could cause depressive symptoms (39), no concurrent treatment (11, 33, 35, 39, 40), no change in medication prior to 1 month of commencing treatment (40) no e-mail address or technological means to access treatment (16, 9, 39, 40), patients with low motivation (22, 33) and being outside of the geographical location of the clinic (22, 33, 35, 39).

Category 3: Use of, and processes for, providing support that are crucial to the provision of iCBT. Supported iCBT achieves positive clinical outcomes for patients (10, 23, 24, 25, 2), provides superior clinical and adherence outcomes over unguided interventions (10, 23, 24, 33, 36), and is regarded positively by the patients (3, 38). Therapeutic alliance is implicated as a mechanism behind the positive effects of supported interventions (13) but its effects are still unclear in iCBT as it has been associated with positive outcomes (5) or to have no effect (13).

The purpose of support in iCBT is to “recognize and reinforce the participants’ work with the self-help material” (23) and promote engagement with the intervention (34, 40). The supporter in iCBT is posited to assume the role of a motivator, where the iCBT platform delivers the core treatment elements (27, 23), and involves therapists monitoring patient progress (29, 30, 12, 22, 38), responding to their iCBT-related needs (29, 36, 38), and guiding the user through the initial set-up (30, 8). Through written support, clinicians can encourage and affirm patients by expressing interest in the thoughts, feelings and behaviours that patients share (16, 24). The quality of support affects client outcomes. For instance, leniency towards patient accountability (e.g. homework completion) is associated with poorer patient outcome (24) and one study found that within written messages, misspellings were frequent, emojis/emoticons were seldom used and that less detailed, shorter messages were associated with fewer online sessions completed (16).

iCBT support has been delivered in a number of ways (23): in-person (26, 21), over e-mail (27, 33, 40), by telephone (2, 12, 21, 33, 38, 40), through the iCBT platform (8, 12, 16, 21, 35, 32), through video conferencing software (32), or by text message (12). Support can occur in real-time (25), on an "on-demand" basis (22) or asynchronously (25, 13, 33, 35). Support can be delivered weekly (21, 30, 11, 12 , 23, 24, 33, 34, 35), or constantly through on-going therapist monitoring (32). Some programmes incorporate homework assignments to inform clinicians when conducting support sessions (22, 12). Three programmes implemented "step-wise" access to modules, where new content could not be accessed without completing a supported session (22), was unlocked 7-days post completion of the previous module (38) or released gradually over an 8 week time period (33).

Such decision around how support is delivered, and its frequency likely influences clinician time demand. Time spent delivering support varies widely (23), ranging from 10 – 100 minutes per session (2, 12, 7, 23, 21, 24, 26, 27, 30, 33, 38, 40) and up to 8 hours per individual per course of treatment (27). Support can be delivered weekly (21, 30, 11, 12 ,23, 24, 33, 34, 35), or constantly through on-going therapist monitoring (32). End of treatment for some programmes was based on a specific time period or number of support sessions received; for example, iCBT was cited across papers to be delivered over a varying course of 7-20 weeks (7, 21, 30, 33, 22, 12, 32). Some programmes involve 6-12 support telephone calls depending on the programme patients receiving (2), that patient receives emails (18), or that the supporter contacts the patient at least once a week for eight weeks (11).

Category– 4 – iCBT can be successfully implemented across supporters with a variety of personal and professional backgrounds. Successful implementation of iCBT included supporters who were volunteer peer-supporters with lived experience of the mental health condition (30), trained volunteers (15) psychologically trained experts (unspecified qualifications; 27), clinical psychologists (30, 4, 11, 12, 16, 31, 32, 33, 35), psychiatrists (4), registered or provisionally registered mental health professionals (14, 30), graduate students of psychology (14, 35), trained

healthcare professionals (15), psychologists-in-training (16, 31), psychotherapists (31), social workers (31, 33), mental health nurses (16), nurses (33), therapists with training on addictions (33) trained technicians (21, 23, 25) and general practitioners (26). There is evidence that untrained technicians (23, 25) or novice clinicians (24) achieve equal outcomes to trained clinicians, and that support from a technician is more effective than a waitlist control group (21).

Sub-domain 3: Contextual considerations for iCBT implementation

Category–1 – Governmental and healthcare regulations affect implementation of iCBT. Governmental and healthcare regulations influence how iCBT can be implemented. An example of this is in Canada, where iCBT has been recognised by the Canadian government and which provides specific funding streams for iCBT services and research (29, 33, 34). Other countries have implemented policy that incentivise use of iCBT to improve access to psychological therapy (4, 15). Other regulations impacting iCBT include limitations placed on therapeutic contact taking place over the internet (13, 15), requiring iCBT clinics to adhere to existing frameworks for the delivery of therapy (14, 12, 24) and policies around the delivery of therapy over the internet (24, 31).

Category– 2 - Lack of workforce availability for iCBT as a limiting factor in the provision of iCBT. The lack of workforce availability can limit implementation of iCBT, particularly because as access to mental healthcare increases so does the demand on services (27, 5). One study in Sweden observed only 1-2 therapists participating in iCBT initiatives among implementing services, and further commented that due to face-to-face resources being expensive and scarce, a dedicated iCBT workforce could resolve this issue in terms of resource and cost (31). Another study stated that the presence of trained iCBT professionals in certain health sectors (e.g. veteran care in the USA) is rare (34).

(34). **Category 3 – Cost models and cost-effectiveness of iCBT maybe an asset for successful implementation.** iCBT was provided to patients through five cost models: free-of-charge (26), through publicly funded healthcare systems (29, 4, 8, 12, 13, 14, 22), subsidised by healthcare

providers (27, 12), at a cost to patients when they are not within certain catchment areas or countries (27) or as part of insurance plans (13). The establishment of re-imbursement systems for iCBT was cited as an important factor for costings in the future (4, 13). One paper hypothesised that as iCBT cost-effectiveness becomes more salient, providers (public or private) will advocate for it as a first line intervention in order to efficiently gatekeep therapeutic resources (27). iCBT did not incur extra costs to public healthcare systems (29), and was cost-effective (depending on the 'willingness to pay' standards of the healthcare body) (39). One study posited that a dedicated iCBT workforce should be developed to create a less-expensive alternative (31).

Discussion

Our mixed-methods systematic review highlights the knowledge we have gained from the available literature on the implementation of iCBT. Some of our key findings regarding the process for implementing iCBT include the practice of iCBT, with special reference to determining client eligibility and effectively supporting patients in iCBT. The management of iCBT in the workplace, especially staff and operational considerations also surfaced as important processes to consider when implementing. Other related findings include the importance of staff training, the management of treatment pathways, security and factors for consideration within the wider context that impact on the implementation of iCBT. In terms of implementation insights, the review has highlighted that clinician and patient attitudes towards iCBT can influence its ability to achieve intended outcomes, the need to continually tailor iCBT for patient benefit, and that further research can help to develop our understanding for implementing iCBT successfully.

As would be expected, the practice of iCBT was highlighted as important to the implementation process for iCBT within a mental health service. For instance, what constitutes eligibility for an iCBT intervention manifested in 2 categories: 1) Screening and inclusion criteria for accessing iCBT need to be thoroughly defined, and 2) Consideration of the usefulness of iCBT beyond the original target of mild to moderate depression and anxiety. Historically, eligibility for

iCBT has been characterised by low symptom presence (mild to moderate) and no significant risk issues. This approach was sensible while establishing iCBTs safety and effectiveness as an intervention, subsequently resulting in well-validated evidence-base supporting iCBT for treating depression and anxiety. Consequently, the preponderance on historical eligibility seems to be an artifact in need of revision. This is especially important in light of the growing body of literature to support iCBTs applicability to more severe presentations of mental health difficulties.[37–40] Additionally, real world data from iCBT clinics highlights that a substantial proportion of patients accessing these services have presentations within the moderate-severe range.[22]

There is a clear need for services to consider the populations they serve (e.g. general severity levels, client demographics) and tailor their model of iCBT provision. Still, despite the available evidence, clinical guidelines lag in their support for iCBT in extended service delivery pathways.[41] This situation poses some difficulty for certain services or health systems to innovate around their use of digital interventions (e.g., the improving access to psychological therapies programme in England, which offers treatment based on NICE Guidelines). Specifically in the English context, the original guideline for the use of iCBT was rolled out in 2004[42,43] and was updated in 2022. Since then, technologies and research have developed, and would suggest the utility of iCBT for the broader population.

Our results highlight the importance of operational aspects of iCBT services. Firstly, the importance of effective management and leadership to support the implementation of iCBT was identified through the review. Transformational leadership approaches, that is leadership styles associated with motivating and compelling employees to participate in a shared vision, [44] have been found to be associated with increased levels of innovation climate, further defined as an organizational climate that is conducive to the adoption of novel, evidence-based practices.[45] Implementing iCBT requires leaders to navigate interactions across multiple levels of a service and motivate staff to ensure the vision of iCBT is fulfilled. However, the current studies identified do not

illustrate in depth the effects of leadership, nor was it their primary or secondary focus. Despite this, it is still important that this finding was communicated through this small pool of studies; more research is needed to inform this gap in knowledge.

Training staff in iCBT and increasing their motivation to use it were both cited as important. As an in-service activity, training clinicians and therapists in the use of evidence-based practice has a substantial literature base.[46,47] However, our findings highlight variance in the training delivered to therapists charged with delivering iCBT, ranging from hours to up to a year of continued education, and the components of the training were also not described at length across papers. The wider literature on training stands in contrast to what we identified; training programmes for evidence-based practice tend to produce better outcomes (e.g. competency, evidence-based practice use, positive attitudes) when multi-component approaches are used (e.g. workshop, follow-up and audit of skills acquired).[46] To date, no systematic evaluation of iCBT training programmes has been conducted, and it has also been cited by one of the included studies that training programmes for these interventions are rare.[48] Similarly, we identified that staff motivation to use iCBT needs to be fostered. This motivation can also be developed through training initiatives, where implementers can illustrate the benefits that iCBT brings to routine clinical practice (e.g., improves patient symptoms and access to care, is usable and not time-consuming), and this activity may potentially influence motivation around intervention use.[49,50]

Further, routine monitoring of the intervention and its outcomes was also cited as important for the continued development of iCBT within service. This activity can allow for supporters in iCBT to reflect on their own practice for the purposes of improving service provision, with one paper stating that clinicians who administer iCBT desire comprehensive updates regarding iCBT to understand its impact on wider service outcomes.[51] This activity is reminiscent of the construct ‘reflexive monitoring’ from normalization process theory,[50] where individual and group reflections on processes around a specific evidence-based practice can lead to revisions in practice that are

adapted to best-suit the needs and structures of the service context. The results regarding the operational aspects of iCBT, despite not being widely reported across the literature, indicate that factors associated with evidence-based practice success in the implementation literature are being considered when iCBT is implemented, which is a promising finding. More widespread reporting of this information could be beneficial to practicing professionals when making choices around using iCBT with their patients.

Patients tend to be positive about iCBT and the support they receive, but clinician attitudes generally lean towards the negative. From service illustrations, we can infer that clinicians receive significant exposure to iCBT when it is implemented, [22,52,53] and its effectiveness is grounded in the literature. Negative attitudes can result in the abandonment of the implementation effort due to a lack of acceptance or misunderstandings around the perceived value of the treatment.[54,55] A better understanding of negative clinician attitudes can be attained if iCBT were to be interpreted as a novel, evidence-based practice. A literature search around clinicians attitudes towards evidence-based practice provides some insights, including that clinicians rate “other” sources of information (e.g. colleague opinion, previous experience) as more impactful than published evidence on their decisions for treatment.[56–58] Fostering attitudes conducive to the uptake of evidence-based practice has been associated with transformational leadership styles[45] and systematic training initiatives that highlight how the evidence-based practice is integrated with the wider service system, [47] both of which were evident within the current review. However, where there is a disconnect between clinicians and service management, or staff do not understand the ‘relative advantage’ (from diffusion of innovations)[59]; of iCBT over existing practice can subsequently create barriers to evidence-based practice uptake.[59,60] This disconnect is well documented in implementation science theories such as Readiness for Change[61] and Implementation Climate, [62,63] both of which also emphasise the role of attitudes in evidence-based practice use and implementation.

iCBTs vary widely in their delivery (guided and self-guided), support timeframes and those

who provide the support, but the take-home is that patients receive the interventions well in terms of satisfaction and clinical outcomes achieved. This malleability of iCBT, where it can assume many forms yet achieve the intended results, underlines the scalability of the intervention. A narrative review of factors associated with scaling public health interventions described that, once an intervention has proven its effectiveness in both small and large scale trials, management and practice factors such as having systems for monitoring intervention performance, funding and interacting with stakeholders within the wider healthcare system become important for the scaling process.[64] Despite this, an “implementation gap” remains, where effectiveness reductions and high levels of attrition occur when we transition from efficacy settings to real world service provision.[65] This further creates a treatment gap within users assigned iCBT as a treatment option, where implementation factors (e.g. abandonment due to encountering bugs and not having a care provider to explore these with may cause attrition, lowering the promise of scalability purported by these treatments.[66]

Limitations

Four main limitations were identified as part of this mixed-methods systematic review. Firstly, we used a targeted search strategy to produce a dataset which the authors acknowledge is incomplete due to lack of proper use of terminology within the field to reference implementation. We therefore acknowledge that the current review is not definitive on the implementation of iCBT, and only reports on relevant factors within the papers identified. Already in research studies there is a movement to standardise the reporting of digitally delivered psychological treatments (e.g. use of CONSORT for e-health),[67] and perhaps this should be succeeded by an attempt to standardise how we report implementation learnings too.

The second limitation consisted of the ‘blind spots’ associated with the development of the analytic framework that may have resulted from the background of the researchers. The authors mainly come from a background in psychology, and none would consider themselves to be

implementation specialists. Other review types (e.g. realist, scoping or narrative reviews) conducted by different research groups may uncover nuances that were otherwise unidentified by the current review.

The third of the study relates to the limitations present in the original papers included in this review. The heterogenous nature of the papers included prevented a formal quality appraisal from being conducted. For instance, we had considered using a tool such as the CASP (critical skills appraisal tool) checklist, but this tool did not provide for a quality review on the narrative-type papers (e.g. Schroder et al., 2016; Andersson et al., 2019; Andersson et al., 2010, and others) that were included. Further, there are issues around assessing the quality of qualitative evidence within review-type studies and whether or not studies should be excluded based on perceived quality which further compounded the issue. [68–70] Thus, we did not assess the quality of included papers and no papers were excluded based on methodological flaws. Relatedly, few papers had a primary objective of exploring a facet of implementation of iCBT for depression and anxiety, which is important to note when interpreting the results.

The fourth and final limitation in the study is whether an expansion of search terms could have been used. For instance, the term “computerized CBT” was not used in the search terms. However, while the search string did not include this term, we did include an abbreviated term for this: “ccbt” and it is notable that using this abbreviated term we identified specific studies that referenced computerized CBT (e.g. Wells et al., 2018; Wright et al., 2019; Kenicer et al., 2012; Wright et al., 2018; Grist et al., 2013). Regardless, it is possible that the search string may not have completely captured all possible studies. **Conclusion**

The current mixed-methods systematic review has identified several strategies for consideration when attempting to implement iCBT. Broadly, these strategies emphasise the importance of effective leadership, managing staff and operations associated with the practice of

iCBT, implementing and developing professionals to provide the supported component of iCBT, accounting for context and deriving implementation insights from novel research contributions, in iCBT for patient benefit. Future research into iCBT in real-world settings should endeavour to supply appropriate supplemental information that details the efforts associated with implementing the intervention within care pathways. In tandem, efforts could be made to standardise practices which can support transferability of learning and scalability supported through the use of a standardised lexicon of terms that are appropriately used.

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Author Contributions:

DD: Conceptualization, Data curation, Formal Analysis, Funding acquisition, Investigation, Methodology, Writing – original draft, Writing – review & editing, **DR:** Supervision, Formal Analysis, Funding acquisition, Writing – review & editing**, GH:** Conceptualization, Visualization, Writing – original draft, Writing – review & editing, **LT:** Funding, Supervision, Writing - review and editing,

Abbreviations: iCBT- Internet-delivered cognitive behavioural therapy

Data availability: Data sharing is not applicable to this article as no data sets were generated or analyzed during this study.

Use of Generative AI: No AI was used in generating this or content used within this manuscript.

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Appendix References

"Appendix 1: [Search terms used within mixed-methods systematic review]"

"Appendix 2: [Description of included papers within mixed-methods systematic review]"

“Appendix 3. [References analysed as part of mixed methods systematic review]”

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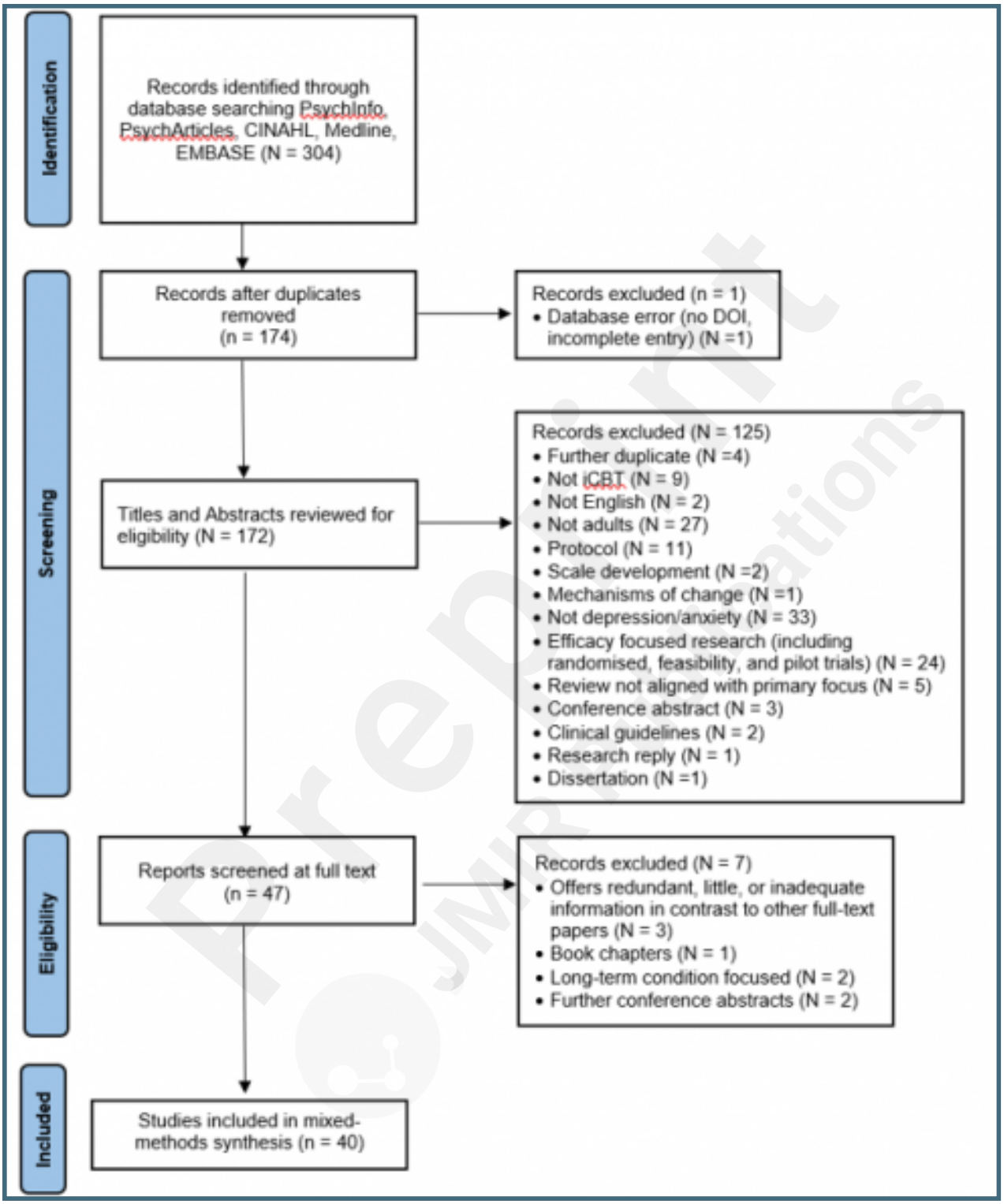
Supplementary Files

Figures

PRISMA diagram for mixed-methods systematic review search.



Multimedia Appendixes

Search terms used within mixed-methods systematic review.
URL: http://asset.jmir.pub/assets/376b14b3fd5a16e2ca4130f68d43664d.docx

Description of included papers within mixed-methods systematic review.
URL: http://asset.jmir.pub/assets/5e889bb5fa993343dc6de70e577ddb58.docx

References analysed as part of mixed methods systematic review.
URL: http://asset.jmir.pub/assets/cfdc00dc24b79404972ad8da4a675878.docx

PRISMA checklist.
URL: http://asset.jmir.pub/assets/8a4ca119d73f8f87466ebf7a4de19e6c.pdf