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## **The Implementation of Internet Interventions for Depression: A Scoping Review**

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## ABSTRACT

**Background:** Depression is one of the most common mental health problems among adults, but effective treatments are not widely accessible. The Internet holds promise as a cost-effective and convenient delivery platform of interventions for depression. However, studies suggest that internet interventions are not widely available in routine settings.

**Objective:** The aim of this study was, therefore, to review the existing literature and examine whether there are systematic differences in the reporting of the various implementation components on internet interventions for depression. Then examine what is known and characteristic of the implementation of these internet interventions in regular care settings.

**Methods:** We performed a scoping review, drawing upon a broad range of the literature on internet interventions for depression in regular care, and used the Active Implementation Framework to extract data.

**Results:** Overall, the results suggested that there is limited knowledge about the implementation of internet interventions for depression in regular care. However, guided support from health professionals, emphasizing program adherence, and recruitment of end-users to the interventions emerged as three main themes. Two additional themes, including training and supervision of practitioners, were identified, but were scarcely described in the literature. The competency drivers (i.e., staff and user selection, training, supervision) have received most attention, while little attention has been given to organizational (i.e., decision-support, administration, and system intervention) and leadership drivers.

**Conclusions:** Research have placed little emphasis on reporting on the implementation of interventions in practice. The leadership and organizational drivers, in particular, have been largely neglected. The results of this scoping review provide implications for future research and efforts to successfully implement internet interventions for depression in regular care.

**Keywords:** depression; scoping review; implementation; internet interventions; regular care

## INTRODUCTION

According to the World Health Organization [1,2], about 350 million people suffer from depression worldwide every year. However, less than 50% (in some countries, less than 10%) of those who suffer, have access to or seek professional help [3]. Barriers to treatment include limited access to effective treatments, stigma, undertreatment, and lack of trained providers [4]. Internet interventions have been proposed as one innovative way to overcome such barriers and systematic reviews show that people can benefit from both unguided and therapist-supported interventions [5–8]. Despite these findings, internet interventions are not commonly used in practice and their uptake and actual reach, both among practitioners and users, appears to be low (see e.g., [9–11]). It is, therefore, necessary to understand factors that can explain the gap between our knowledge about the effects of internet interventions and how to translate these findings into practice.

A lack of availability of internet interventions and, thus, experience with such a treatment modality, has been identified as one important barrier to their uptake and use in practice [12]. It, thus, makes sense that a lack of training in the delivery of internet interventions is another barrier [9,13]. However, recent studies show that discrete implementation strategies such as availability or training, will not necessarily translate an innovation into sustainable changes in practice. In a study by Friesen, Hadjistavropoulos, and Pugh [14], 12 graduate students completed a training workshop in the delivery of internet-based cognitive behavior therapy (iCBT) for depression, anxiety, and panic disorder. One year after the workshop, each student had treated, on average, only three clients. In another study, conducted by Wilhelmsen and colleagues [15], only 1 out of 11 general practitioners (GPs) deployed the guided MoodGYM program as prescribed after training, despite that the GPs expressed a desire to acquire iCBT as a tool to their treatment of depression. Thus, more multifaceted strategies for implementing internet interventions seem necessary, especially for more complex interventions and large-scale implementation.

Earlier experiences from the Improving Access to Psychological Therapies (IAPT) program in the UK, showed that iCBT can be implemented effectively using a number of configurations and setups (i.e., implementation strategies; [16]). However, there was insufficient data to clearly demonstrate that any one configuration was superior to another, which necessitated setups based on needs of the local population and services (i.e., bottom-up implementation). A more recent examination of iCBT in primary care trusts across England

[17], managed to identify more specific barriers to national implementation; (1) availability of alternative interventions, (2) supporter attitudes, and (3) organizational issues such as management support, funding, and intra-organizational communication. These findings allow for a more top-down implementation and emphasize the need for multifaceted, multilevel approaches to implementation (see e.g., [18]). That is, a need to deploy several implementation strategies across different levels in a healthcare service, to ensure successful integration of an intervention in practice. This also means having models of service delivery which describe the practical implementation of internet interventions as part of healthcare services.

Service delivery models would not only describe the practical implementation of internet interventions, but also provide the infrastructure, legal, managerial, and institutional frameworks needed to operate and maintain internet interventions as a service. However, service delivery models have not been adequately described in the literature [19–22], although variations of stepped-care models have been proposed (see e.g., [23]). In stepped-care, internet interventions are suggested as a first step, while reserving more intensive and resource-demanding treatment for those who do not respond and for the most severe cases. One study in the UK found that the implementation of computer-based CBT as stepped care within a specialist service, actually increased service capacity by approximately 50% [24].

There are also alternatives to stepped care such as the Centralized Unit (CU) model [25]. The CU, which is responsible for the web application, training and supervision of therapists, and screening and referring patients to practitioners, is considered a cost-efficient model, providing a high degree of oversight and quality control. A similar model has been used in Sweden and has helped achieve desirable results [26], albeit in a small number of clinics. However, a CU model with a high degree of control may not be viable for large-scale implementation where a decreasing degree of control and more variability in performance may be expected (for example, see: [27]). More work is thus needed to enable integration and dissemination of internet interventions in practice. In this regard, a first step is to map the state-of-the-art of the implementation of internet interventions in routine practice and to identify any knowledge gaps in the existing literature.

### **Aims of this Study**

Therefore, the overall aim of the current study was to review what is known about the implementation of internet interventions for depression in regular care, based on the existing scientific literature. More specifically, the goal was to, first, examine whether there are any systematic differences in the reporting of different aspects of the implementation of internet interventions, and thereby identify any gaps in the literature. Second, examine what characterizes the existing literature on implementation of internet interventions for depression in terms of core implementation components.

## **METHODS**

### **Study Design and Search Strategy**

We conducted a scoping review which has the purpose to identify gaps in the existing literature by systematically assessing the breadth of a body of literature in a particular area, rather than the narrow and specific research questions typical of systematic reviews such as meta-analyses [28,29]. The search was conducted by a medical librarian, using the following scientific databases; (1) International Standard Randomised Controlled Trial Number Register (ISRCTN), (2) OpenGrey, (3) Ovid MEDLINE(R), (4) PsycINFO, (5) PubMed, (6) Web of Science, (7) WHO International Clinical Trial Registry Platform (ICTRP), (8) Cinahl, (9) ClinicalTrials.gov, (10) Cochrane, (11) Embase and (12) Google Scholar (GS). GS was only used for additional searches, as GS is not a traditional scientific database, and has been found unsuitable for systematic literature search [30].

Search terms consisted of the combination of (1) internet; (2) intervention; and (3) depression, including synonyms for all terms (for complete search strategy, see Multimedia Appendix 1). The inclusion of the term 'implementation' and synonyms (e.g., adoption, integration, and dissemination) often used in the literature, produced large and unmanageable number of irrelevant search results initially (i.e., 35 000 – 45 000 articles per database) due to its inconsistent use and different definitions in various disciplines (also, see Study Selection below). Thus, it was not feasible to include implementation in the search strategy. The final search included references published between 1946 to March 24, 2014, and, after running an initial duplicate check, the search results were imported to Mendeley Desktop v1.13.8. After the initial screening process, we also conducted a hand-search of

reference lists in identified reviews and meta-analyses', as well as a hand-search of relevant journals (for a list of journals, see Multimedia Appendix 2). Contact was also made with researchers involved in the European and International Society for Research on Internet Interventions [31,32].

### **Study Selection**

Two independent raters (HBB and LV) reviewed all references for eligibility based on their title, abstract, and author-provided keywords. Included references had to study (1) an internet-based (2) intervention for (3) depression in (4) a regular care setting or (5) clearly indicate examining concepts relevant for implementation (e.g., dissemination, fidelity, acceptability, and effectiveness). Systematic reviews and non-empirical references such as trial protocols, book reviews, editorials, magazine articles, theoretical or methodological papers, were excluded. Studies clearly identified as efficacy trials and offline interventions such as desktop-, computer-based, and CD-ROM interventions, were also excluded from this review. Efficacy trials are conducted in highly controlled settings and outside of regular care, and were not expected to contribute to our research questions. Only references in English and Scandinavian languages were included in the coding process. In case of disagreements between the two reviewers, agreement was reached through discussion. The agreement between the two coders was estimated using Cohen's kappa, resulting in a coefficient of 0.72 (95% confidence interval (CI), 0.64 – 0.81) which is considered to be good (see [33]).

### **Implementation Components**

In order to systematically extract data we applied the Active Implementation Framework (AIF) developed by Fixsen, Naoom, Blasé, and Friedman [34]. In their comprehensive review, they identified a set of core implementation components, which they described as "... *the most essential and indispensable components of an implementation practice or program*" [34]. These include (1) staff and client selection, (2) training, (3) supervision, (4) performance assessment, (5) decision-support, (6) administrative support, (7) system intervention, and (8) leadership. These core components are considered universal and apply to all efforts of implementing an intervention in practice. However, they are also considered compensatory such that weaknesses in one of the components may be overcome by the strengths in other components (e.g., high-quality coaching and performance assessments may compensate for

poor training). Thus, it is not the applied number of components (i.e., the more, the better) that determines the quality of implementation, but rather the quality of how these components are carried out. All references were coded as either containing information (1 = yes) on the respective implementation components or not (0 = no). For each reference coded on an implementation component, corresponding information was extracted for the qualitative synthesis.

According to the AIF, selection, training, supervision, and performance assessments (i.e., treatment fidelity) are referred to as the *competency drivers* [35]. These are concerned with the development, improvement, and sustainment of, most often, the practitioners and supervisors' abilities to work with an intervention in a competent manner. Implementation requires essentially a behavior change by means of training and coaching carefully selected staff in the initial stages of implementation whose performance is assessed (e.g., how well practitioners work with the intervention). The context of an intervention also includes a clear definition of the population for whom the program is intended and the application of inclusion and exclusion criteria to provide safer and better health services to end-users. Thus, the competency drivers in the present study may also pertain to selection, training, supervision, and assessment of end-users.

Decision–support, administrative support, and system intervention comprise the *organizational drivers* [35]. Organizational drivers are concerned with the planning and establishment of support systems such that new interventions can be implemented effectively. This entails collecting data for continuous quality assurance and improvement (i.e., decision–support), reducing obstacles by establishing or making changes to internal policies, rules, procedures, routines, organizational culture and climate (i.e., administrative support), and developing strategies to cooperate with external systems to assure the availability of the financial, organizational, and human resources required to support and continue the intervention (i.e., system intervention). Finally, the *leadership driver* comprises the final core component that is important in terms of setting priorities, establishing consensus, offering incentives, and managing the overall process of implementation [36].

The extracted analysis units were also coded on different organizational levels. This was done to account for multilevel approaches to implementation and was based the IGLO framework that includes the individual, group, leadership, and organizational levels [37]. To



differentiate between individuals at the receiving end of the intervention and individuals delivering the intervention or providing supervision, the individual level was sub-divided into users, practitioners, and supervisors. There is a seemingly overlap between certain components and organizational levels (e.g., supervision and leadership). However, adding the IGLO framework to the coding contributes to specify whether the devised strategies are targeted at formal organizational structures, management, groups or individuals, and whom is the target of those strategies. So, by inclusion, the IGLO framework may help to distinguish units pertaining to, for example, the supervision component that describe the scope of supervision for *supervisors* and units describing who is being supervised (e.g., practitioners).

### **Data Analysis**

We used descriptive statistics for a summary of the included studies. To examine whether there were any systematic differences in the reporting between implementation components, we employed Cochran's Q tests to account for pairwise data (i.e., the same or dependent references), while qualitative data were analyzed according to the template approach to examine what characterizes the implementation of internet interventions in the existing literature (see [38]). A template analysis allows a priori themes to be defined by the researchers, which are subsequently revised by theoretical concepts or perspectives that emerge during the analysis and, hence, inform the research question(s). The analysis in our study was consistent with template analysis described by King [39]; (1) definition of a priori themes (i.e., Active Implementation Framework), (2) extraction of analysis units (LV & HBB), (3) coding on a relevant theme, modifying an existing theme, or devising a new theme (LV & HBB), (4) producing the initial template (LV & FD), (5) developing the template (LV & FD), and (6) interpreting the final template (FD). Finally, it is noted that each time the template was modified; preceding units were re-analyzed according to the modified template and, in order for a theme to be included in the final template, each theme had to include information from a minimum of 10 references. There are no formal procedures for determining the amount of information necessary to constitute a theme. However, it is generally important to avoid producing very narrow thematic structures and becoming too concerned with fine distinctions at lower levels of the coding hierarchy, which may not help making sense of the data or re-present data in a disproportionate way. There is no perfect, final template but a

law of diminishing returns applies and theme saturation is reached when continuing (re-)coding does not enrich the data. For each identified theme, we reported the frequencies and percentages, and provided definitions and examples of the themes.

## RESULTS

As depicted in Figure 1, the final list included 164 publications (for a complete list, see: Multimedia Appendix 3). The main reason for excluding full-text articles was that they did not meet our inclusion criteria (i.e., effectiveness or implementation study of an internet intervention for depression in a regular setting). It is also noted that 43 (11.9%) efficacy trials were excluded because these studies were conducted in a university clinic/laboratory or research context. Hence, the results would have been explainable by the aim of these studies since these are focused on assessing the effectiveness of interventions in a research context, and would not contribute to identifying relevant information about implementation. In addition, 57 (15.8%) and 28 (7.8 %) of full-text articles were excluded on the basis that they were theoretical or methodological papers or unavailable in English or any of the Scandinavian languages, respectively.

The publication of internet interventions for depression meeting our inclusion criteria were published from 2002 and up to the date of our final search on March 24, 2014. There was a modest increase in the number of publications during this period with a marked increase and peak occurring in 2013 ( $K = 51, 31.1\%$ ; Figure 2). Based on the first authors' affiliation, the majority of publications originated from Australia and the United States (Figure 3). If categorized based on geographical region, Europe ( $K = 69, 42.1\%$ ) generated most publications, followed by North-America ( $K = 52, 31.7\%$ ), Australia ( $K = 41, 25.0\%$ ), and Asia ( $K = 2, 1.2\%$ ).

### Implementation Components

Of 164 included references, 122 (74.4%) were coded onto one or several of the implementation components, although none explicitly reported to use the AIF framework. A Cochran's Q test indicated a significant difference in the reporting of implementation components ( $\chi^2(7, N = 164) = 484.56, p < .001$ ; see Table 1). Of the 122 references, 120 (98.4%) were coded on the competency drivers (i.e., selection, training, coaching, and performance), 13 (10.7%) on the organizational drivers (i.e., administrative support, system intervention, and decision-support), and none of the references reported any information on

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aspects of leadership (Table 1). These results were also reflected in the total of 302 analysis units that were extracted, of which 281 (93.0%) and 21 (7.0%) units concerned the competency and organizational drivers, respectively (Table 1).

**Table 1.** Number and percentage of references and units coded on the initial implementation components.

<i>Implementation components</i>	<i>K<sup>a</sup></i>	<i>%</i>	<i>k<sup>b</sup></i>	<i>%</i>
Selection	114	69.5	164	54.3
Training	28	17.1	44	14.6
Supervision	36	22.0	61	20.2
Performance	9	5.5	12	4.0
Decision-support	2	1.2	4	1.3
Administrative support	7	4.3	8	2.6
System intervention	8	4.9	9	3.0
Leadership	0	0.0	0	0.0

<sup>a</sup>K refers to unique references coded onto the various implementation components.

<sup>b</sup>k refers to number of analysis units extracted from the references.

As can be seen in Table 2, of the 164 included references, most contained information pertaining to the selection of users for an intervention, few reported information relevant for practitioners, and almost none reported on higher levels. However, it is interesting to note that almost all information was related to the competency drivers (i.e., selection, training, supervision, and performance assessments), while there was barely any information reported on the organizational drivers (i.e., decision-support, administration, system intervention, and leadership). This may explain the lack of information about the implementation at higher or across organizational levels (i.e., beyond the practitioner-level).

**Table 2.** Number and percentage of references coded onto the initial implementation components across organizational levels.

<i>Level</i>	<i>Selection (%)</i>	<i>Training (%)</i>	<i>Supervision (%)</i>	<i>Performance (%)</i>	<i>Decision-support (%)</i>	<i>Aministrative support (%)</i>	<i>System intervention (%)</i>	<i>Leadership (%)</i>
User	100 (61.0)	8 (4.9)	28 (17.1)	2 (1.2)	0 (0.0)	1 (0.6)	1 (0.6)	0 (0.0)
Practitioner	13 (7.9)	14 (8.5)	15 (9.1)	8 (4.9)	1 (0.6)	1 (0.6)	1 (0.6)	0 (0.0)
Supervisor	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Group	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.6)	0 (0.0)	0 (0.0)
Leadership	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Organization	1 (0.6)	0 (0.0)	0 (0.0)	0 (0.0)	2 (1.2)	4 (2.4)	3 (1.8)	0 (0.0)
Residual <sup>a</sup>	1 (0.6)	1 (0.6)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.4)	4 (2.4)	0 (0.0)

<sup>a</sup>References not accounted for by any of the organizational levels.

Similar to the results in Table 2, the extracted analysis units show that most of the reported information pertained to the user-level. In addition, it became clear that 283 (93.7%) of the analysis units were coded either on the user or practitioner level (i.e., the individual level). This shows that the included references have not taken into account a multilevel perspective on internet interventions or examined internet interventions from an organizational perspective. Furthermore, 281 (93.0%) of the analysis units were also coded on one of the competency drivers. This suggests that key aspects of the overall performance of the organization itself, to support and assure the continuing implementation of an intervention, and the work of practitioners and supervisors, has not been adequately addressed in the literature.

**Table 3.** Number and percentage of analysis units coded onto the initial implementation components across organizational levels.

<i>Level</i>	<i>Selection (%)</i>	<i>Training (%)</i>	<i>Supervision (%)</i>	<i>Performance (%)</i>	<i>Decision-support (%)</i>	<i>Admin. support (%)</i>	<i>System intervention (%)</i>	<i>Leadership (%)</i>	<i>Total (%)</i>
User	122 (40.4)	8 (2.6)	33 (10.9)	4 (1.3)	0 (0.0)	1 (0.3)	1 (0.3)	0 (0.0)	168 (55.6)
Practitioner	40 (13.2)	36 (11.9)	28 (9.3)	8 (2.6)	2 (0.7)	1 (0.3)	0 (0.0)	0 (0.0)	115 (38.1)
Supervisor	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Group	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.3)	0 (0.0)	0 (0.0)	1 (0.3)
Leadership	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Organization	1 (0.3)	0 (0.0)	0 (0.0)	0 (0.0)	2 (0.7)	4 (1.3)	4 (1.3)	0 (0.0)	11 (3.6)
Residual <sup>a</sup>	2 (0.7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.3)	4 (1.3)	0 (0.0)	7 (2.3)
<b>Total</b>	<b>164 (54.3)</b>	<b>44 (14.6)</b>	<b>61 (20.2)</b>	<b>12 (4.0)</b>	<b>4 (1.3)</b>	<b>8 (2.6)</b>	<b>9 (3.0)</b>	<b>0 (0.0)</b>	<b>302</b>

<sup>a</sup>Analysis units not accounted for by any of the organizational levels.

### Qualitative Synthesis

The implementation components served as a priori themes and were applied throughout the analysis to examine the characteristics of the implementation of internet interventions for depression. After coding and revising the a priori themes, the initial template was broken down into 5 different levels; (1) user, (2) practitioner, (3) group, (4) organization, and (5) residual. However, it was clear that many themes counted less than 10 references, indicating narrow thematic structures. Thus, the development of the final template was reduced to two levels and produced 5 main themes; (1) guided support and (2) user recruitment, both subsumed under the user level, and practitioner (3) qualifications, (4) training, and (5)

supervision (Table 4). It is important to note that despite the emergence of these themes, the units that comprise these themes were typically global and scarcely described in the original text. For example, in Clarke et al. [40], it was stated that “*We employed the HMO’s [health maintenance organization’s] electronic medical record ...*” with no further information on how they were given access to the HMO’s medical records (i.e., important system knowledge on access to the target population).

**Table 4.** The final template with meaningful themes, corresponding codes, definitions, and examples.

Level	Theme	1st-level code	2nd-level code	K <sup>a</sup>	%	Definition	Example
<b>1. User</b>				<b>110</b>	<b>67.07</b>		
	1.1. Guided support			26	15.85	An internet-based self-help program including minimal, but regular human involvement and support.	"Program coaches ... provided motivational support to participants and clarified information contained within the program" [41]. "... a weekly 10-minute telephone call from a telephone counselor. The purpose of these calls was to address any issues associated with the participants' use of the intervention" [42].
	1.1.1. Program usage			15	9.15	Human support with guidance and direction on how to work through the intervention and its activities.	"Individuals were spontaneous visitors from around the world to an automated internet-delivered program (e-couch)." [43, p. 344]. "Callers to Lifeline's 24 hour telephone counselling service in four major Australian cities were invited to participate in the trial by a telephone counsellor either during or at the conclusion of a counselling call." [44, p. 2].
	1.2. Recruitment			101	61.59	Activities related to promoting and advertising the intervention to potential end-users.	"... recruited through press releases, banners and advertisements on the Internet, advertisements in magazines, referral by school-doctors, through brochures and posters in schools, and through information to parents who
	1.2.1. Direct-to-consumer marketing			88	53.66	Efforts to promote the intervention directly to end-users.	
		1.2.1.1. Multichannel marketing		23	14.02	Efforts to promote the intervention directly via multiple platforms or communication channels.	

are treated in mental health care ..." [45, p. 2].

	1.2.1.2. Online	28	17.07	Efforts to promote the intervention directly using digital technologies mainly via the Internet.	"Paid advertising with Google was directed at people who had searched for a short questionnaire online to find out whether they had depression" [46, p. 412]. "... recruited ... via a screening survey posted to 70,000 adults randomly selected from the electoral rolls of eight Australian electoral divisions (4 rural, 4 metropolitan)..." [47, p. 61]. "Participants were recruited from 11 General Practices... A member of each of the eleven participating GP Practices identified searched their patient record system to identify patients ...Following identification of appropriate patients, a study information pack was sent by the practice" [48, p. 642] "Two general practitioners and two psychologists, all in Sydney (Australia), referred individuals with symptoms of depression to the first author" [49, p. 2].
	1.2.1.3. Print media	21	12.80	Efforts to promote the intervention directly by means of physical publications.	
	1.2.2. Professional referral	22	13.41	Transfer or direction of end-users for an intervention, both directly and indirectly, by health professionals or treatment providers.	
	1.2.2.1. In-person	15	9.15	Direct transfer of end-users for an intervention by health professionals or treatment providers.	
	<b>2. Practitioner</b>	<b>46</b>	<b>28.05</b>		
	2.1. Qualifications	37	22.56	Formal and informal background education and/or training among practitioners delivering internet interventions.	"Psychological support can be provided by the following: • Graduate mental health worker • Practice nurse • GP • Assistant psychologist • Care worker • Other mental health professionals (Administrators/receptionists can offer some support to ensure that users are set up correctly on the programme but not psychological support)." [16, p. 21]. "Coaches differed in their level of formal training, ranging from master's level
	2.1.1. Therapists	20	12.20	A practitioner formally qualified and trained in	

			psychological treatment methods.	<i>psychology students (n=1) and psychotherapists-in-training (n=1) to experienced CBT-trained psychotherapists with more than 10 years of professional experience (n=3)..." [50]. "Therapists were given training and a treatment manual containing a broad guide of how to respond in their reviews (supporting progress, giving encouragement, specific feedback on activities shared), ..." [51]. "Training involved a mix of didactics and roleplay around conducting functional analysis in perinatal-specific domains with the chief investigator (H.O.), a clinical psychologist with specialty expertise in BA and perinatal depression, and an IAPT trainer (J.W.)" [52, p. 3]. "Comments made by the health care staff to participants in the e-mail sessions were discussed beforehand ... with the CBT specialists." [53, p. 497]</i>
2.2. Training	21	12.80	Acquisition of new knowledge, skills, and abilities required to work with internet interventions.	
2.2.1. Method	11	6.71	Prescribed practice or process of acquiring new knowledge, skills, and abilities needed to produce desired outcomes with the internet intervention.	
2.3. Supervision	11	6.71	Coaching of practitioners working with users through some form of on-the-job training.	

<sup>a</sup>Number of references coded on a theme or sub-theme.

### 1.1. Guided Support

Guided support emerged as one of two main themes among users derived from the a priori coaching theme, where users were provided support online or via telephone, most often, by a therapist. These contact points were typically regular (e.g., weekly), therapist-initiated, and brief (e.g., 10–20 minutes). Guided support usually involved varying forms of non-clinical supervision such as technical support ( $K = 1$ ), preparations for GP visits ( $K = 1$ ), and help with homework assignments ( $K = 1$ ). Most often, however, it was not possible to determine the exact purpose, methods or contents of guided support.

### *1.1.1. Program usage*

Program usage emerged as the only sub-theme under guided support. This specific type of support was related to direction and guidance of users on how to work through the intervention and its activities. In other words, program usage was concerned with assuring fidelity to the intervention. There were two ways of providing support for program usage; either by (1) attending an introductory course or being briefed by practitioners early on about the operations of the intervention, or (2) receiving ongoing help when facing any problems with the intervention or certain tasks.

## **1.2. Recruitment**

Recruitment was derived from the a priori selection theme that was concerned with activities related to selecting end-users, practitioners, and organizations to use or work with an intervention. However, as seen in Table 3 above, 122 (74.4%) out of 164 units were related to end-users. Thus, information initially pertaining to selection across multiple organizational levels was conceptualized as user recruitment and divided in two first-level sub-themes; (1) direct-to-consumer marketing and (2) professional referral.

### *1.2.1. Direct-to-Consumer Marketing*

Direct-to-consumer (DTC) marketing refers to recruitment activities aimed directly at end-users (i.e., the consumer). There is a wide range of DTC recruitment strategies from counseling services ( $K = 4$ ) to organizations ( $K = 2$ ) and school settings ( $K = 2$ ). However, a multichannel strategy, online recruitment or recruitment using print media, were most common, and emerged as second-level sub-themes.

#### *1.2.1.1. Multichannel marketing*

Multichannel DTC marketing involved the combination of two or more recruitment strategies. The studies using multichannel marketing often recruit users from a wider population and use more targeted marketing efforts. For example, in a study by Haga and colleagues [54], the researchers recruited pregnant women through midwives and public health nurses in well-baby clinics and hospitals who, in turn, handed out brochures about the study and intervention. At the same time, pregnant women were also recruited through social media (i.e., Facebook).



#### 1.2.1.2. Online

Online DTC recruitment strategies have mainly consisted of using and testing ads and banners such as Barrera, Kelman, and Muñoz [55]. They examined the impact of Spanish and English keywords for a Google AdWords campaign to recruit pregnant women and found that broad descriptive words related to 'pregnancy', 'health', and 'distress', resulted in higher international enrollment rates. For most recruitment strategies, however, more geographically targeted online advertisements may be necessary, as investigated by Jones and colleagues [56]. Interestingly, they found that between one-third and half of the ads were wrongly targeted by AdWords to nearby postcode areas. In a follow-up study [57], AdWords location targeting was still found to be more effective than posting ads at local organization websites, despite the misdirected ads. Organization websites may still be effective, but need to be advertised through trustworthy, relevant, and familiar mental health organizations [58].

#### 1.2.1.3. Print media

Use of print media has consisted of ads and articles in national and local newspapers, and invitation letters by postal mail (e.g., questionnaires, brochures or study information). In contrast to multichannel marketing, marketing through print media has mostly recruited users from the general public. Only three studies using print media, appear to have used a more targeted approach [48,59,60]. For example, in Woodford et al. [48], general practices searched their patient records to identify patients diagnosed with depression or who may have experienced mild to moderate depression over the last six months.

#### *1.2.2. Professional Referral*

Professional referral is the second first-level sub-theme that emerged under the main theme selection. Referrals were either a part of a multichannel marketing strategy or, most often, direct in-person referrals to an intervention. According to the AIF framework, routines for referral are usually related to system intervention because they entail collaboration with external agencies such as GP practices. However, none of the articles using referrals contained any information on how inter-organizational agreements and routines for referrals were established, evaluated, or how these were embedded in the larger system. Thus, these units were only coded and analyzed as a form of recruitment procedure.

#### 1.2.2.1. In-person

Direct referrals in-person were most common where, for instance, patients were prescribed an internet intervention directly by their general physician or mental health specialist (see e.g., [61]).

### **2.1. Qualifications**

Qualifications was identified as the first main theme among practitioners, derived from the selection theme. Thirty-six (94.7%) of the 38 studies employed practitioners that either had a completed college/university degree or were in their last year of a formal training program, most of which were therapists (see below). In 11 (28.9%) of the 38 studies, interventions were delivered by medical staff consisting of either nurses, general practitioners or both, and, in 7 (18.4%) studies, interventions were delivered by various practitioners such as school teachers, mental health workers or occupational health staff. Interestingly, according to 2 (5.3%) studies, such formal qualifications may not be necessary, and it appears that lay persons may administer internet interventions just as effectively as therapists or mental health workers [62,63].

#### *2.1.1. Therapists*

Twenty (52.6%) out of 38 studies reported the use of therapists to deliver the interventions. Psychologists were employed in 13 (34.2%) studies and an additional 2 (5.3%) studies employed psychologists in combination with other mental health professionals. The remaining 5 (13.5%) studies either employed mental health workers or did not specify the therapists' formal training background.

### **2.2. Training**

Training emerged as a second main theme among practitioners with 1 sub-theme relating to how practitioners were trained in the administration of the internet intervention (i.e., method; Table 4). Of the remaining studies, 9 (23.7%) out of 21 reported on the scope of training (i.e., ranging from brief 1-hour training sessions to 5 days of training), 4 (17.1%) reported providing special training in the skills required to administer the internet intervention such as electronic, text-based communication (see e.g., [64, p. 210]), , 3 (14.3%)

studies mentioned that training was provided either by the intervention developers or principal study investigator, and 1 (4.8%) study arranged educational sessions. Four (17.1%) studies also noted in passing that practitioners received training, but without providing any further information.

### *2.2.1. Method*

A variety of different methods have been used to train practitioners. Four (36.4%) out of 11 studies reported the use of video demonstrations (for example, see; [65, p. 186]). In 3 (27.2%) other studies, practitioners reviewed the contents of the intervention in order to adequately address participant questions and provide assistance with tasks and activities. Two (18.1%) studies used a mix of didactics and practice in, for example, cognitive-behavioral skills or responding to clinical emergencies (e.g., [66, p. 743]). Also, 1 (9.1%) study had a specialist in cognitive-behavioral therapy (CBT) provide a 3-hour lecture about CBT to practitioners, while 1 (9.1%) study provided newly educated psychologists with additional training in delivering the specific treatment manuals.

### *2.3. Supervision*

Supervision was the third main theme among practitioners derived from the initial coaching component. Information was mostly concerned with *the who* ( $K = 8, 44.5\%$ ) and *the extent* ( $K = 6, 33.3\%$ ) of supervision. That is, supervision was mostly provided regularly (e.g., on a weekly basis) by psychologists or therapists. Beyond that, supervision was used for case management in 3 (16.7%) of the 18 studies (e.g., discuss practitioners' response to users in e-mail sessions; see [53, p. 497]), and one study reported using supervision to develop interview scripts for users [67].

## **DISCUSSION**

### **Principal Findings**

The aim of this study was twofold: first, to examine whether there are any systematic differences in the implementation of internet interventions for depression in the literature in terms of core implementation components and, thereby, identify any knowledge gaps. Second, to examine what characterizes the implementation in the existing literature. In total,

164 references were identified, of which 122 (74.4%) were coded onto the Active Implementation Framework (AIF). Overall, the results show that no studies have any hard data about which components are critical for implementation and which components may be adapted without compromising intervention outcomes in regular practice. Information related to the competency drivers (i.e., selection, training, and supervision) was most frequently reported; however, in terms of the organizational drivers, less than 10 references were coded onto decision-support, administrative support, and system intervention, respectively. No studies contained any information related to leadership.

### ***Competency Drivers***

Our results revealed that studies concerned with selection, were focused on the recruitment of users for the intervention or study, rather than finding the right personnel or organizations to carry out or support the new intervention [34]. This is likely to reflect a common practice of reporting on participant recruitment in studies (see e.g., CONSORT statement; [68]), rather than that research has been genuinely concerned with investigating various recruitment strategies. This is supported by the few studies identified to actually investigate recruitment processes (see e.g. [55,56]). Nevertheless, print media and online recruitment strategies were typically used, although a multichannel marketing strategy was most common. The predominance of direct-to-consumer (DTC) strategies (i.e., self-referrals) support the notion that internet interventions for depression have yet to become an integral part of routine care.

The current review found that staff selection has not been studied, but that almost all practitioners had higher education in psychological, medical or other health sciences. The current review also found that formal qualifications may not be necessary to administer internet interventions effectively. However, regardless of qualifications, a strong and active implementation strategy, which integrates and addresses all of the implementation components, is important to maintain their quality and effectiveness [69]. As such, a lack of formal qualifications and practitioner heterogeneity may be compensated for, by, for example, receiving high-quality training and supervision by highly competent and experienced practitioners. Training was, however, typically brief, and consisted of lectures, videos and provision of written materials (e.g., program review or treatment manuals). This does not tell much about the quality of training and it can be argued that the technology does most of the

work of delivering the interventions and, thus, extensive and complex training may not be required. However, a few small-scale studies have shown that brief training is insufficient to sustain changes in practice over time [14,15], while previous studies have demonstrated that frequently used training methods such as reviewing treatment manuals, are not necessarily efficient for acquiring a new set of skills [70,71].

Supervision may compensate for brief training, and has been shown to increase practitioner behavior change [72]. This may be particularly true when regular, ongoing supervision is provided by highly educated and experienced supervisors, which makes it possible for practitioners to embed new clinical skills into their existing repertoire and ongoing work. This may, however, be dependent on highly qualified and skilled supervisors and the methods that are used during supervision. There are many various labels for supervision such as 'consultation' [72], 'coaching' [73], and 'auditing' [74]. However, such implementation strategies were rarely defined, and often inadequately described in the literature. This also seemed to apply to guided support that emerged as a theme among end-users. Thus, it remains unclear what therapist-support consisted of, and it appears that there is heterogeneity in the contents of the therapist-support that is provided. Out of 31 (18.9%) studies, only 1 sub-theme – program usage – emerged. Whether this is because the purpose and clinical guidelines for therapist-support are inadequately described in the literature, or if the heterogeneity in therapist-support is real, was not possible to determine.

### ***Organizational Drivers***

It is important to acknowledge that the competency drivers do not exist in a vacuum, but rely on and are supported by an organization that provides management, administrative structures, and relates to external systems (i.e., service delivery models), all of which can impact on the implementation. However, there were no emerging themes among any of the organizational drivers, despite the importance of components such as decision-support systems and leadership, for improving clinical practice [75,76]. This does not mean that systems for decision-making do not exist or that aspects of leadership have not been addressed in practice. It simply reflects that no studies have properly assessed these implementation components or implementation processes and quality more generally. Some studies did, however, report information related to administrative support ( $K = 7$ ) and system

intervention ( $K = 8$ ), although there was insufficient information for any themes to emerge. However, Andersson and Hedman [19] have identified several issues related to the implementation of iCBT in practice, and which are highly relevant for the administration of internet interventions and system-related work with external agencies; (1) data security, (2) robust web solutions, (3) online assessment procedures (incl. diagnostic interviews), (4) referral routes, patient management, and outcome monitoring, (5) role of professional organizations, and (6) development of clearly formulated policies, procedures, and practice guidelines (see also; [14]). In addition, Titov and colleagues [22] have suggested technical support and legislation across federal, state, and international laws, as barriers that become more actualized with internet interventions. Most of these issues, however, have not been studied, except from referrals, in particular self-referrals, which are likely to affect the uptake and, possibly, adherence to iCBT [77,78].

### **General Discussion**

It is important to establish a robust evidence base for internet interventions, but it is equally important to establish a robust evidence base for the delivery of internet interventions in practice, by moving beyond studies of efficacy and effectiveness to implementation. This is a necessary step to scale-up the dissemination and integration of internet interventions in routine practice, and to ultimately provide better and safer healthcare services. Currently, the limited reporting on the different implementation components limits the value of these studies for decision-makers and other stakeholders, as most of the studies do not include sufficiently relevant information to understand how to translate these results into practice. The lack of emphasis on organizational drivers, in particular, may impede effective implementation. Thus, stakeholders have to rely on and become dependent on the 'know-how' of the relatively few communities working with internet-based prevention and treatment of depression (i.e., Australia, United States, Netherlands, Sweden, United Kingdom, Canada, and Norway).

Implementation of internet interventions in routine care is still in its infancy and there is no strong evidence or methods for transferring internet-based prevention and treatment to service delivery settings (also see; [79]). Service delivery models have not been adequately developed or tested, despite that Governments and professional societies in several countries

are recommending internet interventions in their national guidelines (e.g., Australia [80], United Kingdom [81], Sweden [82], and Norway [83]). Yet, the obvious question is how to integrate internet interventions into new or existing healthcare services for large-scale implementation [22]. Stepped care models and other service delivery models have been proposed [23,25], but should be appraised critically. Technological advances and novel practices may not fit with existing models of healthcare service delivery and may need to be redefined [21]. Already in 2009, Bennett and Glasgow noted [20] that there has been relatively little discussion of contextual issues in e-health. The results in the current review suggests that this has not changed much since then. To date, studies have largely focused on testing the effects of internet interventions on users, while more work remains to understand the organizational, system-wide, and contextual features of implementation. Thus, the important future lessons for internet interventions are really those concerning the knowledge transfer from science to practice. This will support Governments, researchers, and other stakeholders, to implement effective internet interventions in practice, replicate studies, conduct independent research, build competence, and drive development of internet interventions. Currently, Governments, researchers, and others, are dependent on the few, existing experts and research milieus in this field, for the implementation of internet interventions.

### **Strengths and Limitations**

This study has several strengths and limitations; first, we used the scoping review methodology, which is effective in mapping the state-of-the-art and identifying gaps in the literature. However, in line with the methodology, we placed an emphasis on the breadth rather than depth of knowledge and did not assess the quality of the included studies [84]. Second, despite a comprehensive search strategy, the field of internet interventions and implementation are relatively new areas of scientific inquiry. Thus, there is a tremendously wide range of terminology, which prevented us from combining search terms for internet interventions and depression with implementation, which produced large and unmanageable number of search results. Furthermore, the terms 'efficacy' and 'effectiveness' are sometimes used interchangeably and it may be difficult to distinguish whether unguided interventions should be classified as efficacy or effectiveness trials. In contrast to guided interventions, unguided interventions may be offered directly to users from university clinics, private

companies, or online, without being implemented in a healthcare setting (e.g. see; [85]). Consequently, we may have missed some relevant articles or included some efficacy trials. Third, the extensive number of included studies and text material in this scoping review also means that we, most likely, have missed information relevant for implementation. This is mainly because none of the studies have been de facto implementation studies, which means that much of the reported information has been scarce and thereby ambiguous. This has occasionally made it difficult to identify, assess, and code information from the studies, and has, most certainly, left some information unidentified or incorrectly classified and analyzed. However, the extensive number of studies and text material, also means that a larger number of studies and data would be needed, for substantial changes to occur in the results. Fourth, we did not consider that publications are nested within authors. Different authors may emphasize and report on different aspects of the implementation of internet interventions, and publish several articles based on one study. An author may also vary in his or her influence on publications depending on their role and contribution (e.g., principal investigator versus supervisor). Fifth, we used Fixsen and colleagues' [34] Active Implementation Framework (AIF). Other implementation theories and models may have identified other types of relevant information and thus provided different results. According to Tabak, Khoong, Chambers, and Brownson [86], the AIF is more concerned with the integration of evidence-based practices (EBPs) within a setting, than the dissemination of EBPs to the target audience via determined channels using a planned strategy. One of the strengths of this study is, however, that we applied the AIF in a flexible manner and revised the model through the template analysis. As our results show, dissemination of EBPs to target audiences is not adequately addressed in the AIF, which resulted in 'recruitment' emerging as a main theme at the user level. Furthermore, the AIF does not operate at the policy level or higher socioecological levels (e.g., government). The conclusions in this review must be interpreted in the light of these limitations.

### **Future Research Directions**

The scoping review has highlighted several important issues for future research. First, for internet interventions for depression to become more widespread and embedded in regular practice, it is necessary to move from studies of efficacy and effectiveness to implementation. There is a clear need for more primary implementation studies which are based on clearly



defined models and theories of implementation (for overview, see; [86]), and preferably link implementation outcomes with intervention outcomes. This will help distinguish between what is known about an effective treatment (i.e., studies of effectiveness), and what is actually coming to the benefit of clients and providing safer and better healthcare services (i.e., implementation [87]). Second, there is an urgent need to improve reporting guidelines such as the e-health CONSORT statement [88]. The lessons learned about implementation in randomized trials and other studies, can increase sharply, simply by requiring that future studies regularly and systematically describe the implementation of the intervention. Third, there is a need for experimental studies on the effects of specific implementation strategies. For example, which formal and informal qualifications are important for administration of internet interventions among practitioners or what recruitment strategies are likely to be more efficient. However, probably the most striking gap in the literature, is the lack of investigation of the interaction *between* the different implementation components and their relative influence *over time* [34]. For example, the relationship between the amount of training and duration of supervision necessary to administer an intervention in a competent and skillful manner. Fourth, more research is needed at different organizational levels of implementation, including leadership and management practices. Much of the available information on implementation pertains to end-users and much less is known about the practitioners, organizations, and systems which interventions are embedded within. Finally, we would encourage authors and journals to routinely publish implementation protocols similar to study or intervention protocols. This will provide a greater understanding of *what* activities that are necessary and *how* these activities need to be carried out to (re-)produce the achieved results from any given trial. It is, however, also important that implementation protocols use standardized reporting guidelines such as the 'Assessment of transferability and adaptation of health promotion interventions' (ASTAIRE; [89]), to, among other things, ensure that they are directly applicable in practice. Implementation protocols may help explain why some intervention trials succeed and others not and, most importantly; it will support independent research and knowledge transfer between different research communities and contexts.

## **CONCLUSIONS**

This review aimed at investigating what is known about the implementation of internet interventions for depression in the existing literature. Overall, the results showed that limited emphasis has been given to their implementation in practice and that leadership and organizational drivers have been largely neglected. Recruiting users for the interventions was, by far, most commonly reported and typically carried out by the use of print media, online recruitment, or multichannel marketing strategies, and, to some extent, professional referrals. Therapist-support to ensure program usage was also characteristic of internet interventions and, although brief training and regular supervision may be sufficient for administering internet interventions, more research is needed.

The Internet holds promise as an effective platform for the delivery of interventions for depression. However, to progress and make internet interventions more widely available, it is of utmost importance that the field prioritizes implementation practice and research, and move beyond studies of efficacy and effectiveness. Only by allocating research efforts to implementation, the field may be able to provide stakeholders and decision-makers with knowledge of what strategies that promote effective implementation, and consequently, provide better health services for the target population.

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## **ABBREVIATIONS**

iCBT = Internet-based cognitive behavior therapy

AIF = Active Implementation Framework

## **CONFLICT OF INTEREST**

None.

## **MULTIMEDIA APPENDIX**

1. Search strategy

2. List of hand-searched journals
3. List of included references for analysis

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## MULTIMEDIA APPENDIX 1: SEARCH STRATEGY

**Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations and Ovid MEDLINE(R) 1946 to Present (March 24, 2014)**

<b># Searches</b>	<b>Results</b>
1 exp Internet/	48404
2 (ehealth* or e-health* or emental health* or e-mental health* or e-therap* or e-psycholog* or web or website* or internet* or online* or consumer health application* or cybertherap* or cyberpsycholog*).tw.	106328
3 1 or 2	124297
4 exp Therapeutics/	329974
5 exp Psychotherapy/	147509
6 (intervention* or treat* or therap* or psychotherap* or program* or self-care or selfcare or self-management or self-help or selfhelp or self-control or 14 counsel* or education* or training or supervision).tw.	55892
7 4 or 5 or 6	7393847
8 exp Depression/ or exp Depressive Disorder/	148943
9 depress*.tw.	310073
1 8 or 9	346505
1 3 and 7 and 10	19351

## MULTIMEDIA APPENDIX 2: COMPLETE LIST OF HAND-SEARCHED JOURNALS

No.	Journal
1	Addiction
2	Administration and Policy in Mental Health
3	American Journal of Community Psychology
4	American Journal of Preventive Medicine
5	Annals of Behavioral Medicine
6	Australian and New Zealand Journal of Psychiatry
7	Behaviour Research and Therapy
8	Behavioural and Cognitive Psychotherapy
9	BioMed Central
10	BMC Psychiatry
11	British Journal of Psychiatry
12	Cognitive Behaviour Therapy
13	Computers in Human Behavior
14	Dissertation Abstracts International: Section B
15	European Psychiatry
16	Health Education Research
17	Implementation Science
18	Interactive Journal of Medical Internet Research
19	Iproceedings
20	JMIR Cancer
21	JMIR Challenges
22	JMIR Diabetes
23	JMIR Human Factors
24	JMIR Medical Education
25	JMIR Medical Informatics
26	JMIR Mental Health
27	JMIR mHealth and uHealth
28	JMIR Preprints
29	JMIR Public Health and Surveillance
30	JMIR Rehabilitation and Assistive Technologies
31	JMIR Research Protocols
32	JMIR Serious Games
33	Journal of Affective Disorders
34	Journal of Applied Psychology
35	Journal of Clinical Psychology
36	Journal of Consulting and Clinical Psychology
37	Journal of Medical Internet Research
38	Medical Journal of Australia
39	Medicine 2.0
40	PLoS ONE
41	Preventive Medicine
42	Psychiatrische Praxis
43	Psychological Medicine
44	The Journal of Positive Psychology
45	The Journal of Primary Prevention
46	The Sciences and Engineering

### MULTIMEDIA APPENDIX 3: LIST OF INCLUDED REFERENCES FOR ANALYSIS

ID	First author	Publication year	Title	Journal
1	Allen, M	2008	Improving patient-clinician communication about chronic conditions - Description of an Internet-based nurse e-coach intervention	Nursing Research
2	Almlov, J	2009	Therapist factors in Internet-delivered cognitive behavioural therapy for major depressive disorder	Cognitive Behaviour Therapy
3	Bae, J	2009	Development of a user-centered health information service system for depressive symptom management	Nursing & Health Sciences
4	Barazzone, N	2012	Computerized cognitive behavioural therapy and the therapeutic alliance: A qualitative enquiry	British Journal of Clinical Psychology
5	Barrera, A Z	2014	Keywords to recruit Spanish- and English-speaking participants: evidence from an online postpartum depression randomized controlled trial	Journal of Medical Internet Research
6	Batterham, P J	2008	Predictors of adherence among community users of a cognitive behavior therapy website	Patient Preference & Adherence
7	Beattie, A	2009	Primary-care patients' expectations and experiences of online cognitive behavioural therapy for depression: a qualitative study	Health Expectations
8	Bendelin, N	2011	Experiences of guided Internet-based cognitive-behavioural treatment for depression: a qualitative study	BMC Psychiatry
9	Boggs, J. M.	2014	Web-based intervention in mindfulness meditation for reducing residual depressive symptoms and relapse prophylaxis: a qualitative study.	Journal of Medical Internet Research
10	Bolier, L	2013	An internet-based intervention to promote mental fitness for mildly depressed adults: randomized controlled trial	Journal of Medical Internet Research
11	Bowie, C R	2013	Cognitive remediation for treatment-resistant depression: effects on cognition and functioning and the role of online homework	Journal of Nervous and Mental Disease
12	Button, K S	2012	Factors associated with differential response to online cognitive behavioural therapy	Social Psychiatry and Psychiatric Epidemiology
13	Callear, A L	2009	The YouthMood Project: a cluster randomized controlled trial of an online cognitive behavioral program with adolescents	Journal of Consulting and Clinical Psychology
14	Callear, A L	2013	Adherence to the MoodGYM program: outcomes and predictors for an adolescent school-based population	Journal of Affective Disorders
15	Carper, M M	2013	The Dissemination of Computer-Based Psychological Treatment: A Preliminary Analysis of Patient and Clinician Perceptions	Administration and Policy in Mental Health and Mental Health Services Research
16	Christensen, H	2002	Web-based cognitive behavior therapy: analysis of site usage and changes in depression and anxiety scores	Journal of Medical Internet Research



17	Christensen, H	2004	A comparison of changes in anxiety and depression symptoms of spontaneous users and trial participants of a cognitive behavior therapy website	BMJ: British Medical Journal (International Edition)
18	Christensen, H	2004	Delivering interventions for depression by using the Internet: randomised controlled trial	Journal of Medical Internet Research
19	Christensen, H	2006	Free range users and one hit wonders: community users of an Internet-based cognitive behaviour therapy program	Australian and New Zealand Journal of Psychiatry
20	Christensen, H	2006	Online randomized controlled trial of brief and full cognitive behaviour therapy for depression	Psychological Medicine
21	Christensen, H	2007	Reaching standards for dissemination: a case study	Studies in Health Technology and Informatics
22	Clarke, G	2002	Overcoming depression on the Internet (ODIN): a randomized controlled trial of an Internet depression skills intervention program	Journal of Medical Internet Research
23	Clarke, G	2005	Overcoming Depression on the Internet (ODIN) (2): a randomized trial of a self-help depression skills program with reminders	Journal of Medical Internet Research
24	Clarke, G	2009	Randomized effectiveness trial of an Internet, pure self-help, cognitive behavioral intervention for depressive symptoms in young adults	Cognitive Behaviour Therapy
25	Cook, J E	2002	Working alliance in online therapy as compared to face-to-face therapy: Preliminary results	CyberPsychology & Behavior
26	Crisp, D	2014	An online intervention for reducing depressive symptoms: Secondary benefits for self-esteem, empowerment and quality of life	Psychiatry Research Feb
27	Currie, S L	2010	Development and usability of an online CBT program for symptoms of moderate depression, anxiety, and stress in post-secondary students	Computers in Human Behavior
28	Danaher, B G	2012	Web-Based Intervention for Postpartum Depression: Formative Research and Design of the MomMoodBooster Program	JMIR Research Protocols
29	Danaher, B G	2013	MomMoodBooster web-based intervention for postpartum depression: feasibility trial results	Journal of Medical Internet Research
30	De Graaf, L E	2009	Clinical effectiveness on online computerised cognitive-behavioural therapy without support for depression in primary care: Randomised trial	The British Journal of Psychiatry
31	de Graaf, L E	2009	Use and acceptability of unsupported online computerized cognitive behavioral therapy for depression and associations with clinical outcome	Journal of Affective Disorders
32	de Graaf, L	2010	Predicting outcome in computerized cognitive behavioral therapy for depression in primary care: A randomized trial	Journal of Consulting and Clinical Psychology
33	de Graaf, L E	2011	One-year follow-up results of unsupported online computerized cognitive behavioural therapy for depression in primary care: A randomized trial	Journal of Behavior Therapy and Experimental Psychiatry

34	Department of Health	2007	Improving Access to Psychological Therapies (IAPT) Programme: Computerized Cognitive Behavioural Therapy (cCBT) implementation guidance	Department of Health
35	Donker, T	2013	Internet-delivered interpersonal psychotherapy versus internet-delivered cognitive behavioral therapy for adults with depressive symptoms: randomized controlled noninferiority trial	Journal of Medical Internet Research
36	Donker, T	2013	Predictors and moderators of response to internet-delivered Interpersonal Psychotherapy and Cognitive Behavior Therapy for depression	Journal of Affective Disorders
37	Ebert, D D	2013	For Whom Does It Work? Moderators of Outcome on the Effect of a Transdiagnostic Internet-Based Maintenance Treatment After Inpatient Psychotherapy: Randomized Controlled Trial	Journal of Medical Internet Research
38	Eisen, J C	2013	Pilot study of implementation of an internet-based depression prevention intervention (CATCH-IT) for adolescents in 12 US primary care practices: Clinical and management/organizational behavioral perspectives	Primary Care Companion to the Journal of Clinical Psychiatry
39	Farrer, L	2011	Internet-based CBT for depression with and without telephone tracking in a national helpline: randomised controlled trial	PLoS ONE
40	Farrer, L	2012	Web-based cognitive behavior therapy for depression with and without telephone tracking in a national helpline: secondary outcomes from a randomized controlled trial	Journal of Medical Internet Research
41	Farrer, L M	2013	Predictors of adherence and outcome in internet-based cognitive behavior therapy delivered in a telephone counseling setting	Cognitive Therapy and Research
42	Gerhards, S A	2011	Improving adherence and effectiveness of computerised cognitive behavioural therapy without support for depression: a qualitative study on patient experiences	Journal of Affective Disorders
43	Gerhards, S A H	2011	Economic evaluation of online computerized cognitive behavioural therapy without support for depression in primary care: A randomized trial	Journal of Mental Health Policy and Economics
44	Gerrits, R S	2007	Master your mood online: A preventive chat group intervention for adolescents	Australian e-Journal for the Advancement of Mental Health
45	Gladstone, T	2014	Understanding adolescent response to a technology-based depression prevention program	Journal of Clinical Child and Adolescent Psychology
46	Gun, S Y	2011	Acceptability of Internet treatment of anxiety and depression	Australasian Psychiatry
47	Hadjistavropoulos, H D	2012	Dissemination of therapist-assisted internet cognitive behaviour therapy: development and open pilot study of a workshop	Cognitive Behaviour Therapy

48	Haga, S M	2013	Mamma mia: a feasibility study of a web-based intervention to reduce the risk of postpartum depression and enhance subjective well-being	JMIR Research Protocols
49	Hedman, E	2014	Effectiveness of Internet-based cognitive behaviour therapy for depression in routine psychiatric care	Journal of Affective Disorders
50	Hickie, I B	2010	Practitioner-supported delivery of internet-based cognitive behaviour therapy: evaluation of the feasibility of conducting a cluster randomised trial	Medical Journal of Australia
51	Hilvert-Bruce, Z	2012	Adherence as a determinant of effectiveness of internet cognitive behavioural therapy for anxiety and depressive disorders	Behaviour Research and Therapy
52	Hoek, W	2011	Randomized controlled trial of primary care physician motivational interviewing versus brief advice to engage adolescents with an Internet-based depression prevention intervention: 6-month outcomes and predictors of improvement	Translational Research: The Journal of Laboratory and Clinical Medicine
53	Hoek, W	2012	Effects of Internet-based guided self-help problem-solving therapy for adolescents with depression and anxiety: a randomized controlled trial	PLoS ONE
54	Hoifodt, R S	2013	The clinical effectiveness of web-based cognitive behavioral therapy with face-to-face therapist support for depressed primary care patients: randomized controlled trial	Journal of Medical Internet Research
55	Hollingshurst, S	2010	Cost-effectiveness of therapist-delivered online cognitive-behavioural therapy for depression: randomised controlled trial	British Journal of Psychiatry
56	Hunkeler, E M	2012	A web-delivered care management and patient self-management program for recurrent depression: a randomized trial	Psychiatric Services
57	Iloabachie, C	2011	Adolescent and parent experiences with a primary care/Internet-based depression prevention intervention (CATCH-IT)	General Hospital Psychiatry
58	Jacmon, John	2009	Treatment of major depression: Effectiveness of cognitive-behavioural therapy with an internet course as a central component	E-Journal of Applied Psychology
59	Johansson, R	2013	Choosing between Internet-based psychodynamic versus cognitive behavioral therapy for depression: a pilot preference study	BMC Psychiatry
60	Jones, R B	2012	Accuracy of geographically targeted internet advertisements on Google AdWords for recruitment in a randomized trial	Journal of Medical Internet Research
61	Jones, R B	2013	Recruitment to online therapies for depression: pilot cluster randomized controlled trial	Journal of Medical Internet Research
62	Kelders, S M	2013	Development of a web-based intervention for the indicated prevention of depression	BMC Medical Informatics and Decision Making
63	Kelders, S M	2013	Participants, usage, and use patterns of a web-based intervention for the prevention of	Journal of Medical Internet Research

			depression within a randomized controlled trial	
64	Kenicer, D	2012	A national survey of health service infrastructure and policy impacts on access to computerised CBT in Scotland	BMC Medical Informatics and Decision Making
65	Kenter, R	2013	Guided online treatment in routine mental health care: an observational study on uptake, drop-out and effects	BMC Psychiatry
66	Kerr, J	2008	A pilot study to assess the feasibility and acceptability of a community based physical activity intervention (involving Internet, telephone, and pedometer support), integrated with medication and mood management for depressed patients	Mental Health and Physical Activity
67	Kessler, D	2009	Therapist-delivered internet psychotherapy for depression in primary care: a randomised controlled trial	Lancet
68	Kojima, R	2010	Efficacy of Cognitive Behavioral Therapy Training Using Brief E-mail Sessions in the Workplace: A Controlled Clinical Trial	Industrial Health
69	Krusche, A	2013	Mindfulness online: an evaluation of the feasibility of a web-based mindfulness course for stress, anxiety and depression	BMJ Open
70	Kurki, M	2011	Usefulness of Internet in adolescent mental health outpatient care	Journal of Psychiatric and Mental Health Nursing
71	Kurki, M	2013	Integration of computer and Internet-based programmes into psychiatric out-patient care of adolescents with depression	Informatics for Health & Social Care
72	Landback, J	2009	From prototype to product: development of a primary care/Internet based depression prevention intervention for adolescents (CATCH-IT)	Community Mental Health Journal
73	Lemma, A	2013	Feasibility study of a psychodynamic online group intervention for depression	Psychoanalytic Psychology
74	Levin, M E	2014	Feasibility of a Prototype Web-Based Acceptance and Commitment Therapy Prevention Program for College Students	Journal of American College Health
75	Lillevoll, K R	2013	Patients' experiences of helpfulness in guided internet-based treatment for depression: qualitative study of integrated therapeutic dimensions	Journal of Medical Internet Research
76	Lillevoll, K R	2014	Uptake and adherence of a self-directed internet-based mental health intervention with tailored e-mail reminders in senior high schools in Norway	BMC Psychiatry
77	Lintvedt, O K	2008	The need for web-based cognitive behavior therapy among university students	Journal of Technology in Human Services
78	Lintvedt, O K	2013	Evaluating the effectiveness and efficacy of unguided internet-based self-help intervention for the prevention of depression: a randomized controlled trial	Clinical Psychology & Psychotherapy

79	Lintvedt, O K	2013	Evaluating the translation process of an Internet-based self-help intervention for prevention of depression: a cost-effectiveness analysis	Journal of Medical Internet Research
80	Lokkerbol, J	2014	Improving the cost-effectiveness of a healthcare system for depressive disorders by implementing telemedicine: a health economic modeling study	American Journal of Geriatric Psychiatry
81	Mailey, E L	2010	Internet-delivered physical activity intervention for college students with mental health disorders: a randomized pilot trial	Psychology, Health & Medicine
82	Mallen, M J	2011	Online counselling: An initial examination of the process in a synchronous chat environment	Counselling & Psychotherapy Research
83	Maloni, J A	2013	Web Recruitment and Internet Use and Preferences Reported by Women With Postpartum Depression After Pregnancy Complications	Archives of Psychiatric Nursing
84	Mansson, K N	2013	Development and initial evaluation of an internet-based support system for face-to-face cognitive behavior therapy: a proof of concept study	Journal of Medical Internet Research
85	Marko, M.	2010	Adolescent Internet depression prevention: Preferences for intervention and predictors of intentions and adherence	Journal of CyberTherapy and Rehabilitation
86	Mewton, L	2013	A naturalistic study of the acceptability and effectiveness of internet-delivered cognitive behavioural therapy for psychiatric disorders in older australians	PLoS ONE
87	Meyer, B	2009	Effectiveness of a novel integrative online treatment for depression (Deprexis): randomized controlled trial	Journal of Medical Internet Research
88	Meyer, D	2007	Online self-help: developing a student-focused website for depression... www.studentdepression.org	Counselling & Psychotherapy Research
89	Mohr, D C	2010	Interest in behavioral and psychological treatments delivered face-to-face, by telephone, and by internet	Annals of Behavioral Medicine
90	Mohr, D C	2010	Multimodal e-mental health treatment for depression: a feasibility trial	Journal of Medical Internet Research
91	Mongrain, M	2012	Do Positive Psychology Exercises Work? A Replication of Seligman et al. ()	Journal of Clinical Psychology
92	Mora, L	2008	Psychologist treatment recommendations for Internet-based therapeutic interventions	Computers in Human Behavior
93	Morgan, A J	2012	Email-based promotion of self-help for subthreshold depression: Mood Memos randomised controlled trial	British Journal of Psychiatry
94	Morgan, A J	2013	Behavior change through automated e-mails: Mediation analysis of self-help strategy use for depressive symptoms	Behaviour Research and Therapy
95	Morgan, A J	2013	Internet-based recruitment to a depression prevention intervention: lessons from the Mood Memos study	Journal of Medical Internet Research

96	Morgan, A J	2013	Self-help for depression via e-mail: A randomised controlled trial of effects on depression and self-help behaviour	PLoS ONE
97	Moritz, S	2012	A randomized controlled trial of internet-based therapy in depression	Behaviour Research and Therapy
98	Moritz, S	2013	The more it is needed, the less it is wanted: attitudes toward face-to-face intervention among depressed patients undergoing online treatment	Depression and Anxiety
99	Mota Pereira, J	2014	Facebook Enhances Antidepressant Pharmacotherapy Effects	Scientific World Journal
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101	Neil, A L	2009	Predictors of adherence by adolescents to a cognitive behavior therapy website in school and community-based settings	Journal of Medical Internet Research
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