

# Implementation of Internet Interventions for Depression: A Scoping Review

*An investigation of the knowledge on  
implementation of internet interventions for  
depression in the existing literature.*

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## Abstract

Depression is one of the most frequently diagnosed mental health disorders among adults, and appropriate treatment are not widely accessed. The Internet holds promise as a cost-effective and convenient delivery platform of interventions for depression. However, a common finding in health services is the failure to transfer interventions found effective in research, to routine settings. This finding has called for an emphasis of implementation among scholars. This scoping review aims to investigate the existing literature of implementation of internet interventions for depression, as coded onto the active implementation components. Quantitative and qualitative analyses were used to investigate the amount of knowledge of implementation in the field of internet interventions for depression, and what that knowledge entailed. The results suggested that there exists limited knowledge of implementation of internet interventions and that there is a tendency not to report on implementation-relevant factors in the literature of internet interventions. Overall, the competency drivers have received the most attention, while little to no attention have been placed on the organization and leadership drivers. Furthermore, the qualitative analysis revealed that staff selection was not concerned with the selection of practitioners, rather reflect reporting standards in empirical reports. The results of this scoping review provide implications for future efforts in the successful dissemination internet interventions for depression. Implications and recommendations for future research are discussed.

*Keywords:* depression, internet interventions, implementation, the active implementation framework

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

Depression is one of the most frequently diagnosed mental disorders among adults. The World Health Organization estimated in 2012 that about 350 million people across the globe suffers from depression (World Health Organization, 2012). One estimates that one out of five in Norway would suffer from depression in the course of their life, and one out of 10 within a year (Mykletun, Knudsen, & Mathiesen, 2009). Depression impose a substantial challenge on society due to the cost of medical resources used to treat it (Berto, D'Ilario, Ruffo, Virgilio, & Rizzo, 2000) and in terms of reduced production caused of absenteeism (Richards, 2011). It is associated with significant negative outcomes for the affected individual, including substantial and long-lasting decrements in several domains of functioning and well-being, and problems in their relationships, such as impairments in family-functioning (Keitner, Miller, Epstein & Bishop, 1987), as well as physical health problems similar to or even worse than chronic medical illnesses (Hays, Wells, Sherbourne, Rogers & Spritzer, 1995). Depression is also associated with an increased risk of mortality compared to non-depressed individuals (Cuijpers & Smit, 2002). It is stated that depressed individuals are at least as disabled as those suffering from other chronic conditions such as hypertension, rheumatoid arthritis and diabetes (Berto et al., 2000). Depression is the fourth leading cause of the global disease burden and it is the principal cause of disability (Murray & Lopez, 1997).

For the effective treatment of depression, there are several treatment options, such as cognitive behavior therapy (CBT), interpersonal therapy (IPT), self-help therapies and pharmacological treatment. Despite several treatment alternatives depression is regarded as undertreated, which is linked to the notion that many treatment options are not widely accessible (Hollon et al., 2002). Kessler and colleagues (2001) identified several reasons why people with serious mental illnesses do not seek treatment, and identified several situational barriers like inconvenience, that it is too time-consuming, as well as concerns about what other people might think (e.g., stigma). The advancement of technology and the increase in internet access has opened up a new and promising era for untraditional therapies for mental illness, such as computerized therapy that can be delivered on different devices such as computers, tablets, CD-ROMs, DVDs and smartphones. Consequently, these treatment forms present themselves as more convenient as individuals can access them at home at their convenience and without the worry of stigmatization. In recent years, however, Internet-

delivered treatments have been given the most attention in research (Andersson & Cuijpers, 2009).

The format of internet-delivered interventions is quite flexible and can incorporate different therapeutic approaches. In a recent review of web-based interventions for depression, researchers observed that CBT was the most commonly incorporated therapeutic approach (Renton et al., 2014). Other less frequently used approaches included integrated therapies (e.g., CBT and physical activity), psychoeducation, IPT, positive psychology, and narrative therapy.

One frequently used intervention format is therapist-assisted internet cognitive behavior therapy (TAICBT). Which consists of providing the user with psycho-educational material and CBT resources targeting a certain disorder or symptoms (Hadjistavropoulos et al., 2011). The program usually involves different modules, and the user is often encouraged to perform homework assignments following the completion of each module. Several randomized controlled trials (RCT) have demonstrated the effect of TAICBT, in terms of better outcomes for the individual (e.g Perini, Titov & Andrews, 2009; Wagner, Horn & Maercker, 2014). In their meta-analysis of internet-based and computerized treatments for adult depression, Andersson and Cuijpers (2009) concluded that internet treatments hold promise as potentially evidence-based treatments of depression, although more studies are needed.

### **Background**

The Internet holds promise as an efficient and cost-effective platform for the delivery of interventions for mental health problems. Internet interventions refers to a treatment or preventive measure, which utilize the internet or use the internet as an underlying technology. This will mostly include, albeit not exclusively, internet-, mobile-, and tablet-delivered interventions. Several controlled trials have been published on internet interventions for depression, and reviews of the literature indicate that internet delivered cognitive behavior therapy (ICBT) can be as effective face-to-face delivered CBT (Andersson & Cuijpers, 2009; Johansson & Andersson, 2012). Internet-delivered self-help for depression has also promising effects. Berger, Hämmerli, Gubser, Andersson and Caspar (2011) found reductions in symptoms of depression with internet-delivered self-help both with and without therapist guidance, and for both groups these treatment benefits were maintained at 6-month follow-up. Furthermore, psychoeducation delivered via the internet have also shown encouraging effects (e.g., Christensen, Griffiths & Jorm, 2004). Internet interventions have the potential to



enhance patient access to better health care, lower total health care costs, and as a result of easy access to the most appropriate health services, higher quality health care can be delivered.

Over the last 30 years, research has provided us with plentiful evidence-based treatments and practices for different disorders and behavioral problems. Evidence-based practices refers to interventions for which there exists empirical evidence displaying that an intervention can consistently improve client outcomes, like internet interventions for depression (Drake et al., 2001). By the help of these, society has the opportunity to reduce the prevalence of depression if they are disseminated successfully.

Some research efforts have been concerned with factors relevant to the dissemination of internet interventions. Thus, researchers have reflected on the possible hurdles in the development and testing of internet interventions (Andersson et al., 2008; Hadjistavropoulos et al., 2011). User recruitment challenges, has been highlighted as a potential obstacle, as different diagnoses may demand different recruitment methods (Andersson et al., 2008). Also, training methods for therapist-assisted ICBT have been developed. Hadjistavropoulos, Thompson, Klein, and Austin (2012) developed a therapist-assisted ICBT workshop for graduate students. The workshop provided both research evidence and practical information associated with the delivery of ICBT. The workshop improved participants' knowledge and attitudes towards therapist-assisted ICBT. However, there was no follow-up investigating the long-term effects of the workshop. Patients' outcomes have also received attention. For instance, Proudfoot et al. (2003) found that patients tend to be positive to computer interventions, and find them helpful and easy to use. These studies report on dissemination-relevant factors. Still, the knowledge from these studies is not systematized in terms of scientific theories or frameworks. Furthermore, these efforts are not implementation research, where one typically investigate different implementation strategies to observe the effects they have on users and therapists (ICEBeRG, 2006).

Numerous controlled studies yield a growing body of effective evidence-based treatments, but yet there exists little evidence that these treatments are adopted or rewardingly implemented. The challenges comprise moving evidence-based programs into usual care. Researchers are stressing the need to fill the gap between what is known about effective treatment, and what is provided and experienced by consumers (Proctor et al., 2009). Thus, there exists a "science to service gap" (Fixsen & Ogden, 2014, p. 4). Scholars have different opinions of why this gap exists. Some argue that there is a problem with reporting information

concerning the external validity in controlled trials (Glasgow, Bull, Gillette, Klesges, & Dziewaltowski, 2002; Glasgow et al., 2006; Green, 2008; Grimshaw, Eccles & Tetroe, 2004; Steckler & McLeroy, 2008), which makes it challenging for stakeholders and decision-makers to adopt an intervention effectively. Others also stress the need for a consistent terminology in research. Thus, researchers investigating adoption-relevant factors are inconsistent in their use of terms (Michie, Fixsen, Grimshaw & Eccles, 2009). Still, most scholars agree that there is a need to focus more on the mechanisms that influence successful adoption of evidence-based treatments. Consequently, scholars agree that there exist a need to emphasize implementation.

Implementation is defined as “a specified set of activities designed to put into practice an activity or program of known dimensions” (Fixsen, Naoom, Blase, Friedman & Wallace, 2005, p. 5). The ultimate outcome of evidence-based interventions and implementation is better outcomes for the user (Ogden & Fixsen, 2014).

The increasing awareness of the science to service gap have encouraged researchers to identify facilitators and inhibitors of implementation (e.g., Mair et al., 2012). Several factors have been suggested, like training of personnel, which involves selection of personnel, training content, and coaching, and facilitation of implementation, with administrative support and an evaluation approach (Sullivan, Blevins & Kauth, 2008). Berkel, Mauricio, Schoenfelder and Sandler (2011) also suggest fidelity as an important mechanism in successful implementation.

Several models and conceptual frameworks for the implementation of evidence-based programs have been proposed (e.g. Damschroder et al., 2009; Fixsen et al., 2005; Kitson, Harvey & McCormack, 1998). All of these frameworks acknowledge the pressing issue of understanding and enhancing the mechanisms by which new knowledge can be transferred and integrated in routine care. Still, the implementation knowledge across different fields are limited. In their review of the diffusion of service innovations, Greenhalgh, Robert, Macfarlane, Bate and Kyriakidou (2004) concluded that the evidence concerning the implementation of innovations were especially complex and scant, and that it was difficult to separate it from change management and organizational development in general.

### **The active implementation framework**

In their review of implementation frameworks, Meyers, Durlak and Wandersman (2012) found frequent references to 25 different frameworks. One of those frameworks was the active implementation framework, presented by researchers at National Implementation Research Network (NIRN; Fixsen, Blase, Metz & Van Dyke, 2013; Fixsen, Blase, Naoom &

Wallace, 2007; Fixsen et al., 2005; Fixsen, Naoom, Blase & Wallace, 2009). This framework is concerned with *what*, *how* and *who* in relation to implementation. That is, *what* is going to be implemented, *how* is the processes being carried out, and *who* will make it happen? The framework acknowledges a stage approach to implementation, and identified four, recursive stages at practitioner, group and organizational levels. Fixsen et al. (2009) also identifies implementation drivers or components, which are thought to help practitioners use a specific innovation in an effective manner.

**Implementation stages.** An implementation process consists of different stages or phases, in which each stage involves several decisions, actions and changes. The active implementation framework comprise four stages (a) Exploration and adoption; (b) Program installation, (c) Initial implementation; (d) Full implementation (Fixsen et al., 2013). Instead of being linear course, the stages are thought to interact, and in some ways be an iterative process, as one could revisit the exploration stage after the intervention have been fully implemented for years.

The exploration phase is concerned with identifying the needs of the target group, explore how the intervention would make the organization more capable to meet those need, and if the organization is ready and want the intervention. The purpose of exploration is to “assess the potential match between community needs, evidence-based practice and program needs, and community resources and to make a decision to proceed (or not)” (Fixsen et al., 2005, p.15).

To achieve successful implementation, it is important that support exists in different divisions and departments in the organization, especially in leadership positions. In addition, resources needed to implement the intervention should be mapped out. Program installation is concerned with ensuring that the needed resources within the organization, as well as outside funding, is available (Fixsen et al., 2005).

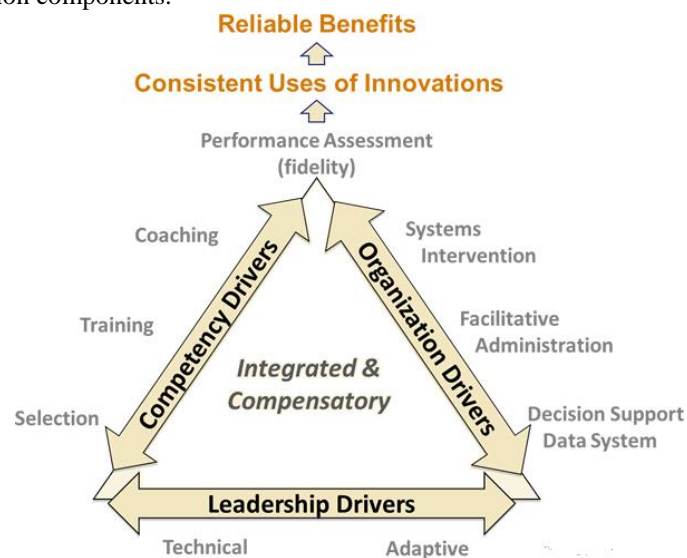
When one reaches initial implementation practitioners are introduced to the new practice and attempt to use their new set of skills within the organization (Fixsen et al., 2013). Furthermore, the organization explore the ways in which it can support and accommodate the new ways of working. This stage is the most fragile, in the sense that struggles with the new practice and the more general challenges associated with change, can be strong mechanisms that can promote feelings of giving up and a return to old, familiar working methods.

Full implementation is reached when the intervention has been an integrated part of regular practice in the organization. Full implementation involves that at least 50% of the

practitioner positions are filled with personnel that meet the fidelity criteria (Fixsen et al., 2007). A challenge to implementation efforts, however, is staff turnover, which makes it difficult to reach full implementation. For each practitioner that leaves, the organization must rehire, train, coach, and assess a new employee. Based on such challenges, Fixsen et al. (2007) hypothesize that few reach full implementation, and for those that do, the span between exploration and full implementation would be somewhere between two to four years.

**Core components.** In their search to identify those mechanisms relevant for successful implementation of evidence-based interventions, Fixsen et al. (2005) reviewed the literature on implementation. They identified several core implementation components which they describe as “...the most essential and indispensable components of an implementation practice or program” (Fixsen et al., 2005, p. 24) (see figure 1). They also highlight the notion of core intervention components, which refer to the most essential and indispensable part of an *intervention*. By knowing which parts of the intervention that are essential, one expect more efficient and cost effective implementation (Arthur & Blitz, 2000; Fixsen et al., 2005).

Figure 1. Implementation components.



Fixsen et al. (2011).

The goal of implementation is to have practitioners base their practice with patients and stakeholders on research findings (Fixsen et al., 2005). To achieve this, one has to create high-fidelity practitioner behavior and work with the core implementation components. The core implementation drivers are dynamic, interactive and compensatory. That is, a weakness in one component (e.g., pre-service training), may be compensated by the strengths in another component (e.g., coaching).

The components exist independently of the quality of the program, but will not produce benefits for the user, unless an effective intervention exist (Fixsen et al., 2005). The core implementation components, also called implementation drivers, include staff selection, pre-service training, coaching, staff and program evaluation, administrative support, system interventions and leadership.

Staff Selection, training, coaching and performance assessments comprise the competency drivers (Fixsen et al., 2013). The competency drivers are concerned with the development, improvement and sustainment of the practitioners' abilities to work with intervention in a competent manner. Organization drivers include decision support, administrative support and system interventions (Fixsen et al., 2013). Organization drivers arrange and develop a support system so that the new intervention can be implemented and collect data that can be used for continuous quality assurance and quality improvement. Leadership drivers include technical and adaptive leadership to secure a persistent and integrated approach to change and performance with the intervention (Fixsen et al., 2013).

**Staff Selection.** Staff selection is concerned with the recruitment of practitioners qualified to carry out the evidence-based intervention; it is a specification of *who* should work with the intervention (Fixsen et al., 2005). Furthermore, staff selection is also concerned with *how*; which methods should be applied to acquire those practitioners. There are most likely several formal qualifications, like education and experience, one should look for, but there may also be factors like motivation, ethics and openness to technology that could be relevant, and should be included in the selection criteria. In their review of the implementation literature, Fixsen et al. (2005) point out that staff selection is a neglected part of implementation research, and that research on specific staff selection variables will increase the likelihood of successful implementation in several fields.

**Training.** "The essence of implementation is behavior change" (Fixsen et al., 2005, p. 43). Implementation of an evidence-based intervention often require some sort of instruction and training in the new work practices to encourage behavior change. Practitioners may have to develop new or change existing abilities, skills, knowledge, and attitudes to accommodate the new ways of working (Fixsen et al., 2005). An organization implementing an intervention should provide opportunities to practice new skills and receive feedback in a secure training environment.

The content of training will depend on the intervention being implemented, but training activities usually include lectures, demonstrations, workshops, and introduction of

manuals. Grol (1997) argue that training workshops are generally ineffective as a stand-alone training method for the promotion of implementation of new clinical behavior. Herschell, Kolko, Baumann and Davies (2010) found in their review of therapist training that multiple studies have been concerned with workshops, workshop follow-ups, and multi-component packages. Still, they conclude that the most frequent used training method in new approaches is to ask the therapists to read written material (e.g., treatment manuals). Research indicate that some sort of reinforcement of the knowledge and abilities acquired during training is necessary to promote behavior change (e.g., Edmunds et al., 2013).

**Coaching.** Many of the abilities needed to use and work with a new practice are acquired during the training process. However, most often, practitioners will need to work with the intervention to internalize those abilities. Spouse (2001) points out that formal knowledge needs to be accompanied by craft knowledge, so that the practitioners can experience the relevance of what they have learned to the situations at hand. Thus, extensive change in ways of working require consultation, supervision and support by a supervisor. Training and coaching are the main ways in which behavior change comes about for the carefully selected practitioners in the initial stages of implementation (Fixsen et al., 2005). Coaching is concerned with reinforcing skill development and the adaption of skills as a response to the intervention, experience with the intervention and practitioners' personal styles.

**Performance assessments.** Performance assessments involve both staff evaluation and program evaluation. Fixsen et al. (2005) propose both staff assessments and program assessments as critical in the implementation process. Program assessments evaluate the key aspects of the overall performance of the organization to help secure continuing implementation of the intervention over time. Brunk, Chapman & Schoenwald (2014) highlight the definition and measurement of fidelity at the program level as a challenge within the implementation research. In their study, they conceptualized fidelity as a program's performance on several key areas, including treatment adherence, treatment completion, program operation guidelines, program capacity, clinical supervisor leadership and stakeholder relationships.

The criteria used to select practitioners, the skills developed in training and reinforced through supervision and consultation need to be assessed. Performance assessments work as a feedback loop for supervisors in terms of how well the practitioners work with the intervention. Measures of fidelity can provide managers and purveyors of the progress of

implementation and the value of the training and coaching efforts (Fixsen et al., 2005).

Purveyor is an individual or group representing a program who actively work to implement that program with fidelity and good effect.

Smith, Daunic and Taylor (2007) noted that a critical factor in deciding the efficacy, effectiveness, and successful dissemination of evidence-based interventions is ensuring that the practitioners who are responsible for its implementation deliver an intervention under study with accuracy and conformity. Thus, to secure that, one should measure treatment fidelity. Treatment fidelity refers to the strategies that monitor and enhance the accuracy and consistency of an intervention to (a) secure that it is implemented as intended and (b) make sure that each component is delivered in a comparable manner to all users (i.e., patients) over time (Bellig et al., 2004; Lane, Bocian, MacMillian, & Gresham, 2004). Measuring adherence and competence has become standard procedure in efficacy research to assess treatment fidelity. Adherence is defined as the degree to which the practitioner follows the procedures of a treatment protocol. Competence refers to the degree of skill demonstrated by the practitioner in the delivery of treatment (Perpeletchikova & Kazdin, 2005). However, in a meta-analysis researchers suggested that neither adherence nor competence was significantly associated with patient outcomes (Webb, DeRubeis & Barber, 2010).

Overall, the measurements of fidelity are used to determine whether patient improvement or lack of improvement is a function of the failure of the treatment (e.g., the internet intervention) or of its application (e.g., treatment delivery) (Shoenwald et al., 2011).

***Decision-support systems.*** Measures like consumer outcomes and organizational fidelity, provide information on the overall performance of the intervention which are used within the organization (Fixsen et al., 2007). This information is used to guide decision-making to assure continuing implementation of the intervention and improvement. In a review of clinical decision-support systems, researches noted that decision support systems significantly improved clinical practice in 68% of trials (Kawamoto, Houlihan, Balas, & Lobach, 2005). Decision-support data systems are a pivotal component of the organizational drivers that should be developed in the program installation and initial implementation stages (Bertram, Blase, Shern, Shea & Fixsen, 2011).

Implementation processes need relevant data to guide decisions about organizational change and staff performance. Hodges and Wotring (2004) argue that monitoring fidelity is crucial in securing that treatments or programs are faithfully implemented, but that it is not a substitute for the monitoring of consumer outcomes. By also received data concerning the

consumer outcomes, decision-makers may assess whether the program are efficient for the target population. Such data may guide the decisions on how to continue with the program.

**Administrative support.** Administrative support is related to several activities that facilitate and organize the practitioner's use of an intervention (Fixsen et al., 2005). Facilitative administration involves establishing or making changes to internal policies, rules, procedures, routines, systems, organizational culture and the organizational climate. In the research on the adoption of evidence-based practice, researchers have observed that although practitioners are positive towards the use of research, workload pressures are a key inhibiting factor for adoption (Humphries, Littlejohns, Victor, O'Halloran, & Peacock, 2000). To achieve successful implementation, the organization should reduce administrative obstacles and arrange for as smooth as possible interaction between practitioners and managers or administrative personnel. Moreover, it is important that the practitioners have the time and support needed to learn new skills and to work with the intervention.

**System interventions.** System interventions refers to strategies to cooperate with external systems to assure the availability of the financial, organizational, and human resources required to aid the work of practitioners (Fixsen et al., 2005). Such strategies could also involve political processes, new referral procedures, and new cooperation routines. The implementation stages unfold in an ever-changing reality of societal, organizational and community factors that are themselves shaped by fluctuating socio-economic, political, and cultural concerns (Bertram et al., 2011). Practice fidelity, population outcomes, and program sustainability may directly or indirectly be formed by the alignment of societal, organization and community systems.

**Leadership.** Competent and attentive leaders are a necessity for effective implementation. The literature on change highlights how leadership is an important contributor to success or failure. In their review of the research on the influence of implementation on program outcomes, Durlak and Dupre (2008) found that leadership is important in an implementation process in terms of setting priorities, establishing consensus, offering incentives, and managing the overall process of implementation. One differentiates between two types of leadership, technical and adaptive leadership. Technical leadership refers to an attentive leadership, which quickly deals with problems that occurs, and organize teams to work with challenges. This type of leadership approach is desirable when technical challenges arise. Thus, when there exist agreement about what the problem is, and how one should deal with it (Daly & Chrispeels, 2008). Adaptive leadership is more appropriate when



more complex challenges is met, where there are less clarity in the ways one should handle those challenges. Among the implementation components, coaching, facilitative administration and system interventions are more likely to require adaptive leadership strategies to identify what the problem involves, what learning will be required to reach agreement about the solutions, and then to attend to attempts to solve the problem (Bertram, Blase & Fixsen, 2013). It has been noted that a common leadership error is to apply technical leadership strategies in situations that require adaptive leadership (Heifetz & Laurie, 1997).

In their synthesis of the literature on implementation, Fixsen et al., (2005) concluded that the most noteworthy gap in the existing implementation literature concerned interaction effects among implementation factors and their relative impact over time. Given that the implementation components are dependent of each other, and weaknesses in one can be overcome by the strengths in another, implementation researchers are encouraged to investigate the links between implementation stages, implementation components, and purveyors' approaches within adoption rates, program and practitioner effectiveness, and implementation site sustainability as the dependent measures (Fixsen et al., 2005).

### **This study**

This study is a part of the Mamma Mia project at the Center for Child and Adolescent Mental Health, Eastern and Southern Norway (RBUP), which is a project concerned with a web-based intervention for postpartum depression (see Haga, Drozd, Brendryen & Slinning, 2013). This particular study is a part of the implementation arm of the project, as the Mamma Mia program is set to be disseminated to well-baby clinics across Norway and the need for information regarding successful implementation mechanism for internet interventions is a necessity.

### **Aims and Objectives**

The aim of this review is twofold, first, to review the existing literature on implementation of internet interventions for depression. Second, to evaluate what is known about implementation, in terms of different mechanisms related to successful use of evidence-based interventions. More specifically, the scope of this study is to examine what is known from the existing literature on implementation of internet intervention for depression, as coded onto the Implementation Components framework (Fixsen et al., 2005; Fixsen et al., 2009), in terms of (1) competency (i.e., staff selection, training, and supervision); (2) leadership (i.e., adaptive and technical); and (3) organizational (i.e., system, decision-support, and administrative support) drivers. By applying the implementation components, we will be

able to identify the frequency of implementation-relevant references, what current research on internet interventions has focused on in terms of implementation, and explore whether there exist any gaps in the literature. A qualitative analysis is also undertaken to collect information regarding the content of implementation knowledge.

## Methods

### Study Design

To find what is known from the existing literature on implementation of internet interventions for depression, we conducted a scoping review. Compared to a systematic review, a scoping review/study address broader topics and are less likely to address very specific research questions (Arksey & O'Malley, 2005). In this scoping review, the methodology and justifications for undertaking it are derived from Arksey and O'Malley's (2005) framework for scoping studies.

Clear stated definitions of scoping reviews are rare, far between and not yet agreed upon (Daudt, van Mossel, & Scott, 2013). Still, the definitions available usually emphasize a «mapping» process of a particular research field (Anderson, Allen, Peckham, & Goodwin, 2008; Arksey & O'Malley, 2005; Daudt et al., 2013; Davis, Drey, & Gould, 2009). Scoping reviews typically aim:

To map *rapidly* the key concepts underpinning a research area and the main sources and types of evidence available, and can be undertaken as standalone projects in their own right, especially where an area is complex or has not been reviewed comprehensively before (Mays, Roberts, & Popay, 2001, p. 194).

Arksey and O'Malley (2005) present four reasons for pursuing a scoping study:

1. To examine the extent, range and nature of the research activity in a distinct area;
2. To determine the value of undertaking a full systematic review;
3. To summarize and disseminate research findings; and
4. To identify gaps in the existing literature.

For this particular study, the first and the fourth reason for conducting a scoping review are the most relevant. Given the flourishing nature of the field of eHealth and internet-based interventions for depression, it appears reasonable to seek to examine the range and extent of the field, and possibly identifying gaps in the existing literature.

### Search Procedure

A medical librarian carried out the search from March 2014 to April 2014. The search for references was conducted using the scientific databases International Standard

Randomised Controlled Trial Number Register (ISRCTN), OpenGrey, Ovid MEDLINE(R), PsycINFO, PubMed, Web of Science, WHO International Clinical Trial Registry Platform (ICTRP), Cinahl, ClinicalTrials.gov, Cochrane, Embase and Google Scholar (GS). GS was only used for additional searches, as GS is not a traditional scientific database, and has been found to have reduced precision and is not suitable for systematic reviews (Boeker, Vach & Motschall, 2013).

Search terms included (1) internet and e-Health; (2) therapy and treatment; and (3) depression/depressive symptoms, with additional synonyms for all terms (for an example of the search procedure, see appendix A). The search was for references published between 1946 to March 2014. The search resulted in 6 669 references after initial duplicate checks which was imported to Mendeley Desktop, version 1.13.8, a reference manager program.

### Screening

Two independent raters screened all references. The screening procedure entailed reading of title, abstract and keywords for the inclusion criteria. A reference was included if it involved an internet-based treatment for depression (see complete list of inclusion criteria in table 1). If an article could not be included or excluded based on the title, abstract or keywords, the article was put in an own folder and were later downloaded in full-text and scrutinized.

Table 1  
*Inclusion Criteria*

No	Internet	Intervention	Mental health
1	cyberpsych*	counsel*	depress*
2	cybertherap*	educati*	depressive symptoms
3	e-health	intervent*	
4	e-mental health	program*	
5	e-psych*	psych* intervention	
6	e-therap*	psych* treatment	
7	internet	psychotherap*	
8	online*	self-care	
9	web*	self-control	
10	website	self-help	
11		self-management	
12		supervis*	
13		therap*	

14	train*
15	treat*

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*Note.* \* refers to the use of different variations of a word (e.g., depression, depressive, depressed).

If the internet interventions targeted comorbid diseases like diabetes and depression, the reference was excluded, as well as interventions targeting general mental health. References primarily concerned with phenomena are correlated with depression, such as grief and rumination, were excluded, as the objective was to review the literature on internet interventions targeting depression. In the screening phase articles in different languages than English and Scandinavian was included, to achieve an overview of the research activity, but were excluded later in the coding process.

In case of discrepancy between the two reviewers, the references in question were jointly re-reviewed and an agreement was reached through discussion. The agreement between the two coders was estimated using Cohen's kappa coefficient for chance-corrected nominal scale agreement between two raters (Cohen, 1960). The resulting kappa was good,  $K=.65$  (95% confidence interval (CI), .61-.69),  $p < .01$ .

### **Additional Searches**

After the initial screening process we conducted a hand-search of reference lists in the included reviews and meta-analyses', as well as a hand-search of relevant journals to assure that only a few references as possible were missed in the our search. Twenty-nine reference lists were searched and if the lists included a reference that was missing from the overall database, we retrieved the reference and it was screened as described above.

The hand-search of journals involved using the same search criteria as described above. Thirty-three journals and databases were searched based on the frequency in our database. We also decided to hand-search journals concerned with e-health and journals concerned with implementation. Some of the journals hand-searched, included Journal of Medical Internet Research, Behavior Research and Therapy and BMC Psychiatry among others (for a complete lists, see appendix B). We examined the search results in the different journals and crosschecked that the references discovered in the search were included in our database. If not, the reference was added and screened as described above.

To ensure that as many references as possible were included in the pool of references, we contacted researchers and authors involved in the European Society for Research on Internet Interventions (ESRII; [www.esrii.org](http://www.esrii.org)) and the International Society for Research on Internet Interventions (ISRII; [www.isrii.org](http://www.isrii.org)). The references received were screened following the same procedure as described above. The most common reason for exclusion

was publication date after April 1, 2014, which was the ceiling for included references in this project, or that the reference already was included in the database.

### **Coding Procedure**

Two independent reviewers coded the references, and were supervised by an experienced researcher. For the coding purpose IBM SPSS Statistics 22 was used in conjunction with Mendeley. The coding procedure was based on a systematic review on e-health interventions (Mair et al., 2012). Each statement in the references relating to factors that promote or inhibit implementation were extracted from Mendeley, and coded on the implementation components in SPSS. The units were coded using a codebook based on the active implementation framework which entailed eight variables, well as a residual variable for data not captured by the framework, but deemed relevant for implementation. References were coded either containing implementation-relevant information (1=yes) or not (0=no). The main variables were defined as following:

1. Staff Selection – Any activities related to recruiting, interviewing, or hiring new practitioners or existing practitioners within the organization.
2. Training – Any activities related to providing specialized information, instruction or skill development in an organized way to practitioners and other key staff in an organization.
3. Coaching/Supervision – Any activities that include personal observation, instruction, feedback, emotional support, some form of training on the job, or debriefing sessions.
4. Performance assessments – Performance assessments relative to practitioners' use of the innovation in the organization.
5. Decision-support – Decision-support systems to assess overall performance of various units of the overall organization itself.
6. Facilitative administration – The establishment and changes of organizational structures and processes to support or actively pursue the use of an innovation by practitioners.
7. System interventions – Changes in external system policies, management, or operating structures or methods in response to experiences gained with the operations of an innovation.
8. Leadership – Leadership within the organization at various levels who make decisions that impact the way practitioners work with the innovation or patients.

The variables were also coded on levels. Even though the active implementation framework is directed at practitioners and the organization involved in the implementation of an intervention, we decided to include the user level as well. In that sense, we also included data that were concerned with how the users or patients for example, were enrolled, prepared

and supported in their use of the intervention. We based the levels on IGLO, the acronym for different organizational levels, individual, group, leadership and organization respectively (Nielsen, Stage, Abildgaard, & Brauer, 2013). Still, to differentiate between individuals who were using the innovation and individuals working with the innovation, the individual level were divided into user and practitioner.

After the coding process we calculated Cohen's kappa to ensure that the agreement between the two reviewers was acceptable. The agreement for the excluded/included articles in the coding procedure was .82, ( $p < .01$ ), which represents very good agreement (Peat, 2001, p. 228). For the different variables we calculated agreement with kappa estimates between  $K=.73$  and  $K=.86$  (all  $p$ -values  $< .01$ ), which represents a good to very good agreement.

### **Validity and Quality Control**

Measures were taken in order to increase the rigor of the research process. During the coding process, the two coders met regularly with the supervisor to discuss the codebook and the active implementation framework to ensure a joint understanding of the content. In addition, examples of problematic cases were discussed, without mentioning information that would make the case identifiable, to ensure the independence between the two coders. Moreover, the two reviewers kept a journal of experiences during the coding procedure, which was discussed during the meetings with the supervisor.

When the coding process was over and the agreement was calculated, a meeting was undertaken where disagreements were discussed. Furthermore, the validity of the content in the units were evaluated.

### **Qualitative Analysis**

**Template analysis.** The units were analyzed according to the template approach developed by King (1998). Template analysis is a form of thematic analysis, which allows the researcher to develop some initial themes, a priori themes, and for supplementary themes to be discovered in the analysis process. In addition, this approach usually focuses on across cases rather than within case analysis (Brooks & King, 2012), which was appropriate for this project where the aim was to get an overview over the research activity on implementation of internet interventions targeting depression. The template approach is flexible in terms of allowing the a priori themes to be influenced by theoretical concepts or perspectives that have informed the aims of the project. In this study the implementation components from the active implementation framework was used as the a priori themes, and concurrent with the template approach, these were tentative and some of these were revised in the analysis.

The analysis of units involved several stages consistent with the template analysis approach, as described by King (2007).

1. The initial template was derived from the active implementation framework.
2. The units extracted from the articles were coded on the implementation components in the coding process.
3. Each unit was scrutinized and either kept in the initial template code, or in a new theme if the initial template was deemed appropriate for the specific unit. For the next unit, the modified template was applied.
4. The next unit was coded in terms of the current template, and again, the template was modified in accordance with any relevant information that did not correspond with an existing theme.
5. Each time the template was modified, it was reapplied to preceding units, so that every unit had been analyzed according to the template derived from the final unit.
6. In order to be included in the final template, themes had to include information from at least two articles.
7. A final rereading of the units was undertaken to ensure that the labels were appropriate for the content of the units.

The results of the qualitative analysis is presented below in accordance with standards for reporting qualitative research (O'Brien, Harris, Beckman, Reed & Cook, 2014), with focus on interpretation and linkage to the evidence in tables.

### **Statistical analysis**

To evaluate the frequency of references reporting implementation-relevant information descriptive statistics analyses were used. We also employed cross tabulation and the chi square test of independence to test for significant associations between the coding on the different variables. Thus, to investigate if there were relations between the reporting of different implementation components. We report the Yates' correction for continuity, because it compensates for the overestimation done by the Pearson Chi-Square, when testing a 2 x 2 table. Thus, by using the Yates' correction for continuity we reduce the probability of committing a Type I Error, which involve reporting non-significant results as significant (Field, 2009). The same test was applied to check whether the number of codes was significantly different from what would have been expected by chance. The phi coefficient was used to estimate effect sizes, which entails a quantifying of the size of the difference between groups (Durlak, 2009). The phi coefficient is a correlation analysis for dichotomous

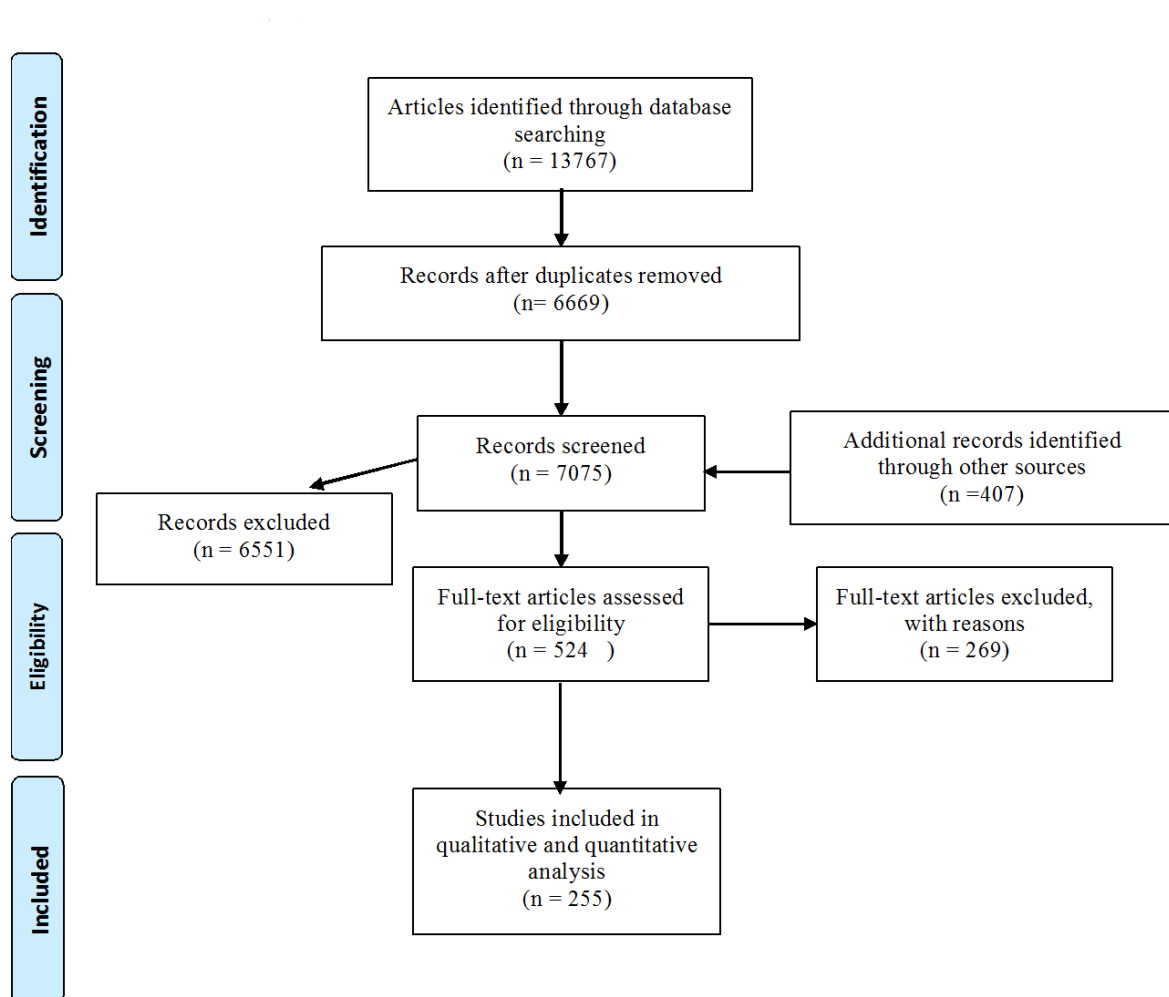
variables, and ranges from + 1.00 through zero (absolutely no relationship) to - 1.00. Thus, phi is interpreted like the Pearson product-moment correlation coefficient. By knowing the effect size or magnitude of an effect, allow for ascertaining the practical significance of statistical significance (Fritz, Morris & Richler, 2012).

### **Results**

The search procedure described above resulted in 13767 references, after the duplicates were removed. We were left with 7 075 unique references which were screened. We excluded 6 551 based on title, abstract and keywords. Five-hundred and twenty-four references were retrieved in full-text, and of these, of which 255 met the inclusion criteria (see figure 2). The included references are presented in appendix C. The included references were not evaluated in terms of methodology or study quality, as quality assessments does not form part of the scoping review (Arksey & O'Malley, 2005). Twenty-eight (10,41 %) references were excluded on the basis that they were in non-English or non-Scandinavian language, while 57 (21,19%) were excluded because they were not empirical reports. We also attempted to include implementation relevant terms in the initial search, which gave results ranging from 30 000 to 40 000 references. Because of this vast result, we decided to adhere to the search procedure only including search terms for depression and internet interventions.



Figure 2. Flow chart of study selection.



24 (8,92%) of the references retrieved in full-text which appeared relevant by the screening of the title, abstract and keywords, did not concern depression, but rather comorbid diseases or other psychological disorders (e.g., comorbid depression and cardiovascular disease or anxiety disorders). If the information in an article was inconclusive or inadequate to decide whether to exclude or include, we included the article, on the basis that the scoping review methodology entails more of a mapping procedure, where it is better to include too many than too few references.

### Descriptive Statistics

A total of 255 references were included, out of those 157 (61,57 %) contained information that fit in the active implementation framework. Table 2 displays a complete overview of the distribution of references and units for the eight implementation components. Most of the units were coded on to the competency drivers (i.e., staff selection, training or

coaching). As depicted in table 2, staff selection was, by far, the most frequently coded on. No references were coded on decision support or the leadership drivers, therefore these were not included in the chi-square analysis.

Table 2  
*Coding on to the different implementation components*

Variable	K	Percent	Cumulative Percent	k	Percent
Staff Selection	142	55,50 %	55,50%	209	52,38%
Training	34	13,30 %	68,80%	47	11,75%
Coaching	60	23,40 %	92,20%	95	23,81%
Performance	10	3,80 %	96,00%	10	2,51%
Administrative support	5	2,00 %	98,00%	5	1,25%
System interventions	5	2,00 %	100,00%	14	3,51%
Decision support	0			0	
Leadership	0			0	

*Note.* K refers to unique references. Thus, the number of unique references coded on to the different variables. k refers to units.

The chi-square were used to check whether the number of references reporting information coded on the implementation components were different from what would be expected by chance. Only the competency implementation drivers, staff selection, training and coaching, had higher count than expected by chance. Which indicate that in the literature there is most information on the competency drivers, besides performance assessments.

### **Association between the Different Components**

A chi-square test of independence was performed to examine the relations between the different implementation components. We compared all the variables that were coded onto the implementation components; all potential relationships were examined. References were coded as either containing implementation-relevant information (1=yes) or not (0=no). The significant results are reported below.

The association between staff selection and training was significant, ( $\chi^2 (1, n = 255) = 15,36, p < .01, phi = .26$ ). The chi value is quite large, but the phi coefficient is low to moderate, indicating that there is a relationship between the coding on staff selection and training. However, examination of the 2 x 2 table, indicate that those references that do not report on training, generally do not report on staff selection and vice versa. Thus, we obtained a significant result because most references do not report information related to the two

variables. The association between staff selection and coaching was also significant, ( $\chi^2 (1, n=255) = 28,90, p < .01, phi = .35$ ), indicating a similar relationship and suggesting that the tendency is not to report information related to neither staff selection nor coaching, as most of the references are coded as no (i.e., no staff selection relevant information).

Training and coaching entails skill development and some sort of instruction and supervision in the work with the new intervention. The association between these variables was significant ( $\chi^2 (1, n=255) = 45,32, p = .01, phi = .43$ ). This association had the largest effect size of all the relationships, using Cohen's (1988) criteria of .10 for small effect, .30 medium effect, and .50 for large effect, we interpreted this effect to be medium to large. However, the significant result obtained is affected by the high co-occurrence of non-reporting of both training and coaching relevant information ( $k = 185$ ). Furthermore, only 24 (9,41%) references are both coded on training and coaching.

The association between the articles coded on training and performance assessment yielded significant results, but the effect size was small, indicating a weak relationship between the two ( $\chi^2 (1, n=255) = 4,23, p = .04, phi = .16$ ). Still, this association could in part be affected by the low frequency of articles coded on performance assessments. Nonetheless, the significant result should be interpreted as the results above.

Coaching involves some sort of supervision of practitioners. Performance assessments is linked to an evaluation of the practitioners in terms of some sort of criteria established in relation to the new ways of working. The association between these two variables was significant ( $\chi^2 (1, n=255) = 9.95, p = .02, phi = .22$ ). Again, the obtained significance is influenced by the high frequency of references that do not report information concerning neither coaching nor performance assessments.

### **Results from Template Analysis of Units**

The initial template was based on the implementation components pointed out in the active implementation framework (Fixsen et al., 2005). The final template consisted of eight main themes. The final template is presented in appendix D. The main themes were user recruitment, program referral, training, supervision, support of users, performance assessments, administrative support, and system interventions (see table 3).

The distribution of units and their corresponding frequencies are presented in table 3.

Table 3  
*The main themes from the qualitative analysis*

Theme	Unique references (K)	Percent	Definition	Example
User recruitment	K=90	57,32%	The activities related to recruiting, promoting and advertising the innovation to potential users.	“midwives/public health nurses handed out a brochure and offered to try Mamma Mia”.
Program referral	K=29	18,47%	Activities related to the referral process of users to an innovation by health professionals or other personnel.	“Two general practitioners and two psychologists, all in Sidney (Australia), referred individuals with symptoms of depression to the first author”.
Training	K=37	23,57%	Activities related to skill-development of practitioners and users in response to a new intervention.	“We trained physicians in one hour programs using a lecture and example video tapes”.
Supervision	K=39	24,84%	Activities related to instruction, consultation and coaching of practitioners working with the new intervention.	“The author of the coaching manual led weekly supervision meetings”.
Support of users	K=27	17,20%	Non-therapeutic support of users thought to enhance and ease their use of the intervention.	“therapists offered their help and assistance and asked if the participant was facing any problem with the program or with the tasks”.
Performance assessments	K=9	5,73%	Assessments of practitioners’ performance with regards to the new intervention.	“Treatment integrity and adherence to the treatment manual were monitored during supervision”.
Administrative support	K=5	3,18%	The provision of personnel thought to support practitioners’ use of the new intervention.	“The technician (KM) was employed in an administrative role as a Clinic Manager...”.
System interventions	K=5	3,18%	Collaborations with outside agencies to support the organizations use of the new intervention	“the programmes were disseminated to GPs and clinicians through a prescription and/or referral process...”.

*Note.* K refers to unique references

**User recruitment.** The user recruitment theme is derived from the initial staff selection theme. Staff selection is concerned with the selection of practitioners qualified to

work with the new evidence-based intervention. However, none of the references in our database concerned the selection of practitioners. Rather, the information initially coded on staff selection was related to the recruitment of participants to the intervention. The units contained information about the activities in which one recruited the users or patients to the internet intervention for depression. Most of the references reported the recruitment method, such as advertisements in newspapers, posters or online advertising. The units coded on staff selection, were divided into two themes, namely user recruitment and program referral.

Ninety (35,29 %) of the 255 references contained information relating to user recruitment. Most of these used posted advertisements (e.g., advertisements in local or national newspapers). Several references used online advertisements. Furthermore, the use of social media as a medium to reach users was also used quite frequently, of which Facebook was the most used. Google ads was also frequently reported recruitment method. Some references recruited users by posting advertisements on internet forums and sites for depressed individuals or concerned with general mental health.

Seven (2,75 %) references used brochures to recruit users to the intervention. In these cases there was typically a health professional handing out the brochures in health clinics, pharmacies or community centers.

Only four (1,57%) references reported the effectiveness of different recruitment methods (Jones, Goldsmith, Hewson & Williams, 2013; Jones, Goldsmith, Williams & Kamel Boulos, 2012; Morgan, Jorm & Mackinnon, 2013; Woodford, Farrand, Bessant & Williams, 2011). These references compared and evaluated the effectiveness of different approaches to recruit participants to internet interventions. For example, Morgan, Jorm and Mackinnon (2013) observed that Google ads accounted for nearly half of the total participants who signed up and that internet-based recruitment to mental health interventions is feasible and relatively affordable.

Overall, the references included, give limited information about the recruitment message and what type of information given to possible users in the recruitment process.

**Program referral.** Twenty-nine (11,37%) unique references contained information relating to the referral of patients to an internet intervention for depression. Some of these references both had referral from primary care and secondary care. However, most of the referral came from primary care and the general practitioner/physician. In a few cases, the patients were referred after a risk screening at their general practitioner. This theme would normally be related to system intervention component in the active implementation

framework, as system intervention involves cooperation with external institutions to support the use and work with the intervention. However, none of the references mentioning referral, contained information beyond the fact that users were referred from health institutions. That is, there was no information on how organizational agreements and cooperation of referrals were established, the development or establishment of referral procedures, how these were embedded in the larger system or context, and so on. Thus, these units could only be coded and analyzed as a recruitment procedure. For those references reporting a referral procedure, it was only reported that it existed a de facto cooperation between the organization providing the intervention and the primary care institution recommending and refers patients to it

**Training.** 37 (14,51%) references were coded onto the main theme training. The theme is defined as activities related to skill-development in response to a new intervention. In this theme there is reported information concerned with *what*, *how* and *how much*. *What* are the practitioners trained in, what type of skills are the training activities aiming at improving or developing? *How* are these skills being improved or developed? Thus, which training methods are employed in the skill-development? And *how much* training is provided for the practitioners? The scope of the training is concerned with *what* the training contained. Nine (24,32%) of the 37 references reported the training content. Some training efforts focused on the content of the program, having the practitioners review the material in the different program modules. Four (1,57%) unique references reported training content specific for internet interventions, as the practitioners were trained in internet-related therapeutic skills, such as like therapeutic writing.

Under the training method theme, there was a division between training efforts aimed at the practitioners and users. Some programs ( $k = 6$ , 2,35%) provided the users with an instruction manual, to better equip them to work through the program. Some references had training manuals for the practitioners that provided them with information on how to administrate the program. Three (1,18%) references reported that they briefed the users in terms of how they should use the program and helping them signing up.

There were some studies using lectures and video demonstrations in the training of practitioners. However, there was little information beyond what method employed. It was not uncommon that one article reported the training method employed without reporting the content and length, or that another article reported that the practitioners received one day of training, but did not provide any information about the method or content.

**Supervision.** The supervision theme is derived from the initial coaching theme. Supervision is divided into four secondary themes, format of supervision, the content of supervision, supervisor(s) and schedule. Thus, the theme is concerned with *how, what, when* and *by who*. Thirty-nine (15,29%) unique references contained information about the supervision. Supervision is defined as the activities relating to instruction, consultation and coaching of practitioners working with the intervention. In terms of format, some references reported using group supervision. However, most references did not report the format of the supervision; rather they reported that the practitioners received supervision without any information beyond that such as scope, duration or content of supervision.

Ten (3,92%) references, however, did include information about the content of the supervision sessions. Monitoring of the treatment fidelity was the most common topic of the supervision sessions, although, only four (1,57%) reported that they monitored fidelity.

In most of the cases, there was an experienced therapist supervising the practitioners. In a few cases, the articles reported that the first author conducted the supervision (k=5, 1,96%). All the studies reported continuous supervision, with one exception, where the supervision was continuous until mastery was achieved.

**Support of users.** Some information that was initially coded on the coaching variable, concerned non-therapeutic support of users (k=27, 10,59%). In these cases, the users received some sort of support that would aid in the use of the intervention. Most of these cases included of technical support, where users had the opportunity to contact a coach or technical assistant with questions or report issues with the intervention.

**Performance assessments.** There was limited information concerning performance assessments of practitioners in the data material. Only ten (3,92%) references reported any information regarding the evaluation of practitioners, nine of these were included in the theme performance assessments. Eight (80,00%) of these articles reported the criteria for assessment, namely treatment fidelity and adherence. Nevertheless, the measures for performance assessments were not explicitly stated in any of the references, one (0,39%) reported using audio-tapes as basis for discussion of treatment fidelity.

**Administrative support.** Only five (1,96%) references contained information related to administrative support. Of these five, three (60,00%) were concerned with the provision of technical support to the practitioners. For instance, one article reported that one technician was hired to work as a supportive resource for the practitioners. Still, there was very limited

information in this variable, and may reflect the research activity on this particular component.

**System interventions.** Only five (1,96%) references were coded on system interventions. The information from those articles was limited. However, the main content of the units regarding system interventions, was different collaborations with outside agencies. In one reference, they reported a collaboration with occupational health sections, thus, the organization was allowed to use the health sections' websites to promote the intervention. The other references provided limited information about the collaboration, beyond the fact that they received some sort of support from external systems.

### Discussion

The aim of this thesis was twofold: first, to review the existing literature on implementation of internet interventions for depression. Second, to evaluate what is known about implementation, in terms of different mechanisms related to successful use of evidence-based interventions. This study based the review of the implementation knowledge in the existing field on the core components proposed by the active implementation framework. The references screened and coded on the core components were analyzed both quantitatively and qualitatively, to explore both the amount of knowledge as well as the content of that knowledge.

The screening process identified 255 references that contained information regarding internet interventions for depression. 157 (61,57 %) of these articles were further coded onto the implementation framework. The most frequently variables coded onto were staff selection, training and coaching. There existed limited information concerning performance assessments in our database. Furthermore, of the organization drivers, only five references were coded onto the administrative support and system interventions variables. No references were coded onto the leadership drivers or decision-support systems.

The distribution of references and units indicated that most of the reporting on implementation of internet interventions for depression was concerned with the recruitment, training, coaching and evaluation of practitioners. However, the tendency was not that obvious. The qualitative analysis of the units revealed that many of the references concerned with staff selection, was focused on the recruitment of users to the intervention or the study, rather than finding the right personnel to carry out the new practices as defined by the framework (Fixsen et al., 2005). This finding highlights the value of undertaking both a quantitative and qualitative analyses of the data material. For instance, there was not a single



reference in the final sample of articles concerned with the recruitment of practitioners. Furthermore, if we had adhered strictly to the theory that underlying the codebook, and not coded on the various levels (e.g., users or patients), the data material would have presented itself as minimal. Because of the possibility for misinterpretation with respect to the staff selection variable, this variable will not be given much emphasis in the discussion of the results, and will be referred to as user recruitment from hereafter.

The chi-square test of independence was used to check whether the coding on the different implementation core components exceeded the expected count by chance. The coding on the leadership drivers and organizational drivers was minimal. Hence, only the user recruitment variable, the training variable and the coaching variable reach counts higher than expected by chance. This finding further support the emphasis in the existing literature on the competency drivers, except for the performance assessment component. However, as noted above, staff selection variable is concerned with the recruitment of users to the program rather than practitioners. Hence, exiting literature has been mostly concerned with reporting information related to the training and coaching activities concerning implementation as formulated by Fixsen et al. (2005).

In our statistical analyses, we wanted to test whether there existed associations between the references coded on one variable (e.g. coaching) and a reference coded on another variable (e.g. performance assessments). The results yielded significant associations between the references coded on coaching and training, with the largest effect size (.43) in the sample of associations. The significant association indicate that most references do not report information related neither training nor coaching activities. 24 (9,41%) references were both coded on training and coaching. This present itself as quite low, given that researchers have highlighted that training and coaching of practitioners may be activities that are dependent of each other. Researchers have observed that different training modalities have limited gains in therapist adherence, skill and knowledge (Beidas, Edmunds, Marcus & Kendall, 2012), but that number of consultation hours can predict higher therapist adherence and skill. As the researchers put it themselves “Ongoing support made it possible for therapists to embed the new clinical practice into their existing repertoire of skills” (Beidas et al., 2012, p. 660).

The association between coaching and performance assessments, as well as the association between training and performance assessments, yielded significant results. Nonetheless, the effect sizes for these associations was small. Only four references reported information concerning training activities and performance assessments, while seven reported

on coaching and performance assessments. Although this is a quite low frequency of co-occurrence, only ten references were coded on performance assessments, which entails that 70% of the articles reporting performance assessment-related information also had some sort of coaching activities or supervision of practitioners. One of the objectives of performance assessments is to inform the coaching processes and function as a measure of the quality of coaching (Schoenwald, Henggeler, Brondino & Rowland, 2000; Schoenwald, Sheidow & Letourneau, 2004), so ideally the association or co-occurrence between these two variables should be much higher.

The qualitative findings further supported the trend from the statistical analyses. The largest theme were user recruitment, with 90 units concerning the methods for acquiring participants/users/patients to the internet intervention. The use of a qualitative approach made it apparent that the staff selection variable was not concerned with the recruitment of suitable practitioners; instead, the theme was re-named to the more suitable user recruitment and program referral. The problem with the user recruitment theme is that most articles report the process of recruiting participants to the study. Therefore, user recruitment does not necessarily reflect with a true concern for different recruitment methods to new interventions, but rather the reporting practice for empirical reports (see e.g., the CONSORT 2010 statement; Schulz, Altman, & Moher, 2010). Hence, the relatively larger proportion of references report on recruitment and the incomplete or superficial descriptions of the recruitment procedures (e.g., most references do not describe the content of information brochures or recruitment ads).

The qualitative analysis of the units, revealed quite a large theme concerning training activities (K=37, 23,51%). The theme was defined as activities relating to skill-development in response to a new intervention. Contrary to staff selection, this theme was focused mainly on practitioners and the information was related to the content of training, training methods, and how much training that was provided. Training methods employed lectures, workshops and the provision of written material (e.g., treatment manuals). This is a frequently used training method, but is not necessarily as efficient. Scholars have stated that treatment manuals are being too linear and similar to cooking books (Kendall & Beidas, 2007), and that they are often not sufficient for behavior change (Miller, Sorensen, Selzer, & Brigham, 2006). A closely linked theme was supervision, with 39 (24,84%) unique citations containing information regarding the coaching activities. Hence, as highlighted by the quantitative analyses, the core components receiving most attention in research were coaching and training

of practitioners. This corresponds with the trend in the general implementation literature, where numerous reports evaluate the effectiveness of training and coaching activities (e.g., Abbass et al., 2011; Beidas et al., 2012; Beidas, Koerner, Weingardt, & Kendall, 2011; Dulko, 2007; Herschell et al., 2010).

This review did not code any references on the leadership drivers and little information was found concerning the organization drivers. The references concerned with the organization drivers reported information coded on the facilitative administration variable and the system interventions variable. The main finding in terms of administrative support was the provision of a technical support person. It refers to the technical assistance offered to practitioners once the intervention begins. Durlak & Dupre (2008) suggest that the objectives of technical assistance are to maintain provider's motivation and commitment, improve their skill levels where needed, and support local problem solving efforts. In this review, there was not enough information to determine whether the technical support identified in the references adhered to those objectives. In terms of system interventions, the only information collected from the data material involved some sort of collaboration with outside agencies. However, the information was too limited to evaluate the value and content of the collaboration.

The scarce reporting on how the different implementation strategies were used, appeared as a general trend in the included references. This can in part be due to the high prevalence of controlled trials in the data material and that many of the references was in the efficacy trials of different programs. Moreover, the limited reporting of the use of different implementation components limits the value of these references for decision-makers and stakeholders, as most of the references do not include enough information for an outside person to assess the value of using the components, or even how to use the components.

### **General Discussion**

The Internet has the potential to be an effective platform for the delivery of interventions for depression. Several controlled trials report encouraging results, which indicate that internet interventions for depression can, if implemented successfully in routine settings, be a cost-effective option for the treatment of depression.

Researchers and scholars have identified implementation research as one of the most critical issues in mental health service research (Proctor et al., 2009). This review has investigated the existing literature on implementation of internet interventions for depression. Based on this review, the knowledge on implementation of web-based interventions for depression appear scarce and sporadic. Furthermore, this is noted in other reviews of

evidence-based programs in the field of health services with less specific intervention of interest (e.g. Greenhalgh et al., 2004).

This scoping review of implementation of internet interventions for depression indicates that the knowledge in the existing literature is limited and that the implementation components given the most emphasis are training and coaching efforts. Fixsen et al. (2005) noted in their synthesis of the implementation literature that training by itself is not an effective implementation method. In this review, training and coaching efforts comprise the most salient and used implementation components, which is a step in the right direction as coaching activities have been shown to increase behavior change (e.g., Beidas et al., 2012).

In this review, most references reported using supervision, without elaborating the content and format. Michie et al. (2009) stress the fact that implementation strategies are rarely defined and are often inadequately described. There is an inconsistency in the use of terms for different implementation strategies adopted. For instance coaching, in the existing literature various labels have been used, such as consultation (e.g., Beidas et al., 2012), supervision (e.g., Mannix et al., 2006) and audit and feedback (Dulko, 2007; Jamtvedt, Young, Kristoffersen, O'Brien, & Oxman, 2003). This poses a challenge in understanding if these concepts are the same or distinctively different from each other, making it problematic to compare and evaluate them. Thus, it limits meta-analyses and systematic reviews, as well as other contributions. Future research endeavors should be explicit in their use of implementation strategies and give description adequate for stakeholders to identify and select strategies that have the potential to promote successful implementation. As pointed out by Durlak & Dupre (2008) "science cannot study what it cannot measure accurately and cannot measure what it does not define" (p.342). The use of common definitions of implementation strategies and an elaborate description are thought to further the implementation research and the knowledge of what is working (Greenhalgh et al., 2004). This review endorses that proposal, as the citations concerning implementation of internet interventions for depression is characterized by deficient descriptions and definitions.

This scoping review also observed the limited knowledge and reporting of organizational and leadership drivers. Fixsen et al. (2005) argue that the competency drivers do not exist in a vacuum. They rely on and are supported by an organization that provide facilitative administrative structures and processes that select, train, coach and evaluate the performance of practitioners; carries out program evaluation functions to provide direction for decision-making; and intervenes in external systems to secure continuous resources and

support for the program in the organization (p. 58). Hence, the organizational drivers must be present to secure the facilitation and support of the selection, training, coaching and evaluation efforts. The lack of emphasis on organizational drivers may impede effective dissemination of internet interventions for depression. Therefore, recommendations for future research should emphasize the need to explore the organizational mechanisms that encourage successful implementation.

Leadership factors are often mentioned as key for successful implementation of evidence-based programs (e.g., Bradley, Webster, Baker, Schlesinger & Inouye, 2005). The active implementation framework suggest that both technical and adaptive leadership should be applied to implementation processes (Bertram et al., 2011). In this review we mostly encountered controlled trials and efficacy studies, and there was no reporting of factors related to leadership drivers. Thus, in accordance with the scoping review methodology, we identified a gap in the existing literature concerning role of leadership in implementation of internet interventions. In the future research of implementation one should focus on larger units of analysis (e.g., organizations, communities), that enable the measurement of the effects of the leadership drivers as well as the organizational drivers.

Fixsen et al. (2005) pointed out that the most striking gap in the research literature concerning implementation, was the lack of investigation of the interaction between the different implementation factors and their relative influence over time. The majority of references included in this review reported using one or two implementation strategies (e.g., training and coaching). Scholars have questioned if it is even possible to measure the impact of components in isolation and independently (Greenhalgh et al., 2004). There should be a move in the research literature for a more comprehensive study of implementation components, which include several components and measure their interactions.

A high amount of resources has been used on efficacy and effectiveness trials of internet interventions for depression; as these interventions present themselves as both cost-effective and convenient, as well as effective in reducing symptoms of depression. However, to achieve a successful dissemination of internet interventions and ideally reach individuals not accessing traditional treatment, implementation must be given increased emphasis. There is a need to progress from efficacy to effectiveness to implementation research to widespread adoption of evidence-based programs, such as internet interventions. Glasgow, Lichtenstein and Marcus (2003) suggest that the assumption that effectiveness research naturally follow successful efficacy research is an underlying reason for the “science to service” gap. The

main objective of effectiveness studies is to measure the influence of an intervention when it is tested on a representative sample of the target population. Efficacy studies, on the other hand, aim to establish a causal relationship between the intervention and outcomes. Glasgow et al. (2006) argue that an increase of focus on external validity and representativeness will aid the bridging of the “science to service” gap. Still, this review also encourages the need for implementation research that measure the impact of the implementation components in the different implementation stages, to establish knowledge of the interaction between components over time.

### **Limitations of the Present Study**

This review have certain limitations related to the methodology and analyses. In the next section the possible influence of these limitations will be discussed.

**Methodology.** The first limitation concern the scoping review methodology. This method is effective in identifying gaps in the literature and in the mapping of a particular field. Still, a possible challenge with this review method is the emphasis on breadth rather than depth of evidence (Davis et al., 2009). Thus, the scoping review method does not assess the quality of included citations. No measures were taken in this review to evaluate the quality of included citations. Hence, a citation with reduced quality (e.g., low effect size) are weighted equally as a typical high-quality citation. Compared to a systematic review, scoping reviews do not reduce the quantity based on quality, which in turn reduces the possibility of providing a detailed analysis and appraisal (Arksey & O’Malley, 2005).

**Analyses.** Another limitation concern the chi square analysis. In this review the assumption for independence was not met. The chi square test for independence assume that the variables are mutually exclusive. That is, that a particular case fits into one and only one of each of the variables (McHugh, 2013). In this review a citation may have been coded on several variable (e.g., coaching and performance assessments). The data in this review would possibly be more appropriately tested by tests like Cochran’s Q or McNemar’s Q.

In this review we did not control for the possibility that one author could have contributed with several citations, which in turn can have influenced the results. If one author or group of authors have published several articles concerning for instance training activities, the analysis will still count these individually and could possible lead to a misinterpretation of the existing literature. The conclusions in this review must be interpreted in the light of these limitations.

### Conclusions

This review aimed at investigating the knowledge of implementation of internet interventions for depression in the existing literature. The results from this review provide support for the notion that limited emphasis have been given to the different implementation components suggested by Fixsen et al. (2005). The largest variable in this study, staff selection, was not concerned with the selection of practitioners to carry out an intervention; rather it was influenced by reporting norms of participant recruitment in empirical reports. The two components receiving the greatest attention in the data material were training and coaching efforts. Still, as concluded by other researchers, the information concerning these strategies was limited, especially in terms of how they were used and what they involved, which made it challenging to assess the effectiveness and differentiate between different usages of the strategies. Additionally, the organization and leadership drivers were given little to no attention in the literature on internet interventions for depression.

The Internet holds promise as an effective delivery platform for depression intervention. The present review recommends practical changes in the future research to further the dissemination of internet interventions. The implications from this review involve the movement from efficacy to effectiveness to implementation research. There still exists a pressing need to investigate the interactions between the different implementation components. To achieve this, the field must prioritize implementation studies, which include larger units of analyses, like organization, and observe the effects of the different components, over longer periods of time. By allocating resources to such types of research, the field may be able to strive and provide stakeholders and decision-makers with knowledge of what strategies that promote effective implementation of internet interventions for depression, and consequently, better outcomes for the target population.

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## Appendix A: Example of the search procedure

#	Searches	Results
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/	3299774
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 counsel* or education* or training or supervision).tw.	5589214
7	4 or 5 or 6	7393847
8	exp Depression/ or exp Depressive Disorder/	148943
9	depress*.tw.	310073
10	8 or 9	346505
11	3 and 7 and 10	1935

## Appendix B: Complete list of the hand-searched journals

Addiction  
Administration and Policy in Mental Health  
American Journal of Community Psychology  
American Journal of Preventive Medicine  
Annals of Behavioral Medicine  
Australian and New Zealand Journal of Psychiatry  
Behaviour Research and Therapy  
Behavioural and Cognitive Psychotherapy  
BioMed Central (<http://www.biomedcentral.com/>)  
BMC Psychiatry  
British Journal of Psychiatry  
Cognitive Behaviour Therapy  
Computers in Human Behavior  
Dissertation Abstracts International: Section B:  
The Sciences and Engineering  
European Psychiatry  
Health education research  
Implementation science  
Journal of Affective Disorders  
Journal of Applied Psychology  
Journal of Clinical Psychology  
Journal of consulting and clinical psychology  
Journal of Medical Internet Research  
Medical Journal of Australia  
PLoS ONE [Electronic Resource]  
Preventive Medicine  
Psychiatrische Praxis  
Psychological Medicine  
The Journal of Positive Psychology  
The Journal of Primary Prevention

## Appendix C: Included references

Article 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	Amstadter, A B	2009	Internet-based interventions for traumatic stress-related mental health problems: a review and suggestion for future research	Clinical Psychology Review
4	Andersson, G	2013	Effectiveness of guided internet-based cognitive behavior therapy in regular clinical settings. [German]	Verhaltenstherapie
5	Andersson, G	2013	Randomised controlled non-inferiority trial with 3-year follow-up of internet-delivered versus face-to-face group cognitive behavioural therapy for depression	Journal of Affective Disorders
6	Andersson, G	2013	A 3.5-year follow-up of Internet-delivered cognitive behavior therapy for major depression	Journal of Mental Health
7	Andersson, G	2013	Effects of two forms of Internet-delivered cognitive behaviour therapy for depression on future thinking	Cognitive Therapy and Research
8	Andersson, G	2012	Therapeutic alliance in guided internet-delivered cognitive behavioural treatment of depression, generalized anxiety disorder and social anxiety disorder	Behaviour Research and Therapy
9	Andersson, G	2009	Internet-based and other computerized psychological treatments for adult depression: a meta-analysis	Cognitive Behaviour Therapy

10	Andersson, G	2005	Internet-based self-help for depression: randomised controlled trial	British Journal of Psychiatry
11	Andersson, G	2004	Behavior therapy cognitive Internetbasierte fir easy until middle depression: Prediction of the therapy success after 6-monatiger Katamnese	Verhaltenstherapie
12	Andersson, G	2004	Delivering cognitive behavioral therapy for mild to moderate depression via the internet: Predicting outcome at 6-month follow-up	Verhaltenstherapie
13	Andrews, G	2010	Computer therapy for the anxiety and depressive disorders is effective, acceptable and practical health care: a meta-analysis	PLoS ONE [Electronic Resource]
14	Bae, J	2009	Development of a user-centered health information service system for depressive symptom management	Nursing & Health Sciences
15	Barazzone, N	2012	Computerized cognitive behavioural therapy and the therapeutic alliance: A qualitative enquiry	British Journal of Clinical Psychology
16	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
17	Batterham, P J	2008	Predictors of adherence among community users of a cognitive behavior therapy website	Patient preference & adherence
18	Beattie, A	2009	Primary-care patients' expectations and experiences of online cognitive behavioural therapy for depression: a qualitative study	Health Expectations
19	Bell, V	2007	Online information, extreme communities and internet therapy: is the internet good for our mental health?	Journal of Mental Health

20	Bendelin, N	2011	Experiences of guided Internet-based cognitive-behavioural treatment for depression: a qualitative study	BMC Psychiatry
21	Berger, T	2011	Internet-based treatment of depression: a randomized controlled trial comparing guided with unguided self-help	Cognitive Behaviour Therapy
22	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
23	Bolier, L	2013	An internet-based intervention to promote mental fitness for mildly depressed adults: randomized controlled trial	Journal of Medical Internet Research
24	Bowie, Christopher 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
25	Brakemeier, E L	2013	CBASP@home: Ein internetbasiertes situationsanalysen-training zur stabilisierung des therapieerfolgs nach stationarer therapie fur chronisch depressive patienten. [German]	Verhaltenstherapie
26	Button, K S	2012	Factors associated with differential response to online cognitive behavioural therapy	Social Psychiatry and Psychiatric Epidemiology
27	Calear, A L	2013	Adherence to the MoodGYM program: outcomes and predictors for an adolescent school-based population	Journal of Affective Disorders
28	Calear, A L	2010	Review of internet-based prevention and treatment programs for anxiety and depression in children and adolescents	Medical Journal of Australia
29	Calear, A L	2009	The YouthMood Project: a cluster randomized controlled trial of an online cognitive	Journal of Consulting and Clinical Psychology

			behavioral program with adolescents	
30	Carlbring, P	2013	Internet-based behavioral activation and acceptance-based treatment for depression: a randomized controlled trial	Journal of Affective Disorders
31	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
32	Choi, I	2012	Culturally attuned Internet treatment for depression amongst Chinese Australians: a randomised controlled trial	Journal of Affective Disorders
33	Choi, M	2012	Computer and internet interventions for loneliness and depression in older adults: a meta-analysis	Healthcare Informatics Research
34	Christensen, H	2013	State of the e-mental health field in Australia: where are we now?	Australian and New Zealand Journal of Psychiatry
35	Christensen, H	2009	Adherence in internet interventions for anxiety and depression	Journal of Medical Internet Research
36	Christensen, H	2008	Plenty of activity but little outcome data: a review of the "grey literature" on primary care anxiety and depression programs in Australia	Medical Journal of Australia
37	Christensen, H	2006	Online randomized controlled trial of brief and full cognitive behaviour therapy for depression	Psychological Medicine
38	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
39	Christensen, H	2004	Delivering interventions for depression by using the Internet: randomised controlled trial	BMJ: British Medical Journal (International Edition)
40	Christensen, H	2004	A comparison of changes in anxiety and depression symptoms of spontaneous users and trial participants of a cognitive behavior therapy website	Journal of Medical Internet Research

41	Christensen, H	2002	Web-based cognitive behavior therapy: analysis of site usage and changes in depression and anxiety scores	Journal of Medical Internet Research
42	Clarke, G	2009	Randomized effectiveness trial of an Internet, pure self-help, cognitive behavioral intervention for depressive symptoms in young adults	Cognitive Behaviour Therapy
43	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
44	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
45	Cook, J E	2002	Working alliance in online therapy as compared to face-to-face therapy: Preliminary results	CyberPsychology & Behavior
46	Coull, G	2011	The clinical effectiveness of CBT-based guided self-help interventions for anxiety and depressive disorders: a systematic review	Psychological Medicine
47	Cowpertwait, L	2013	Effectiveness of web-based psychological interventions for depression: A meta-analysis	International Journal of Mental Health and Addiction
48	Crabb, R M	2012	Is computerized cognitive-behavioural therapy a treatment option for depression in late-life? A systematic review	British Journal of Clinical Psychology
49	Crisp, D	2014	An online intervention for reducing depressive symptoms: Secondary benefits for self-esteem, empowerment and quality of life	Psychiatry Research Feb
50	Cuijpers, P	2011	Self-guided psychological treatment for depressive symptoms: A meta-analysis	PloS One
51	Currie, S L	2010	Development and usability of an online CBT program for	Computers in Human Behavior



			symptoms of moderate depression, anxiety, and stress in post-secondary students	
52	Danaher, B G	2013	MomMoodBooster web-based intervention for postpartum depression: feasibility trial results	Journal of Medical Internet Research
53	Danaher, B G	2012	Web-Based Intervention for Postpartum Depression: Formative Research and Design of the MomMoodBooster Program	JMIR Research Protocols
54	Day, V	2013	Internet-based guided self-help for university students with anxiety, depression and stress: a randomized controlled clinical trial	Behaviour Research and Therapy
55	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
56	de Graaf, L E	2010	Predicting outcome in computerized cognitive behavioral therapy for depression in primary care: A randomized trial	Journal of Consulting and Clinical Psychology
57	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
58	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
59	Dear, B F	2013	Internet-delivered cognitive behavioural therapy for depression: A feasibility open trial for older adults	Australian and New Zealand Journal of Psychiatry
60	Dear, B F	2011	An open trial of a brief transdiagnostic internet treatment for anxiety and depression	Behaviour Research and Therapy

61	Donker, T	2013	Predictors and moderators of response to internet-delivered Interpersonal Psychotherapy and Cognitive Behavior Therapy for depression	Journal of Affective Disorders
62	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
63	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
64	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
65	Ellis, L A	2011	Comparative randomized trial of an online cognitive-behavioral therapy program and an online support group for depression and anxiety	Journal of CyberTherapy and Rehabilitation
66	Eysenbach, G	2004	Health related virtual communities and electronic support groups: systematic review of the effects of online peer to peer interactions	BMJ
67	Farrer, L	2013	Technology-based interventions for mental health in tertiary students: systematic review	Journal of Medical Internet Research
68	Farrer, L	2012	Web-based cognitive behavior therapy for depression with and without telephone tracking in a national helpline: secondary outcomes from a randomized	Journal of Medical Internet Research

			controlled trial	
69	Farrer, L	2011	Internet-based CBT for depression with and without telephone tracking in a national helpline: randomised controlled trial	PLoS ONE [Electronic Resource]
70	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 Oct
71	Foroushani, P S	2011	Meta-review of the effectiveness of computerised CBT in treating depression	BMC Psychiatry
72	García-Lizana, F	2010	Telemedicine for depression: a systematic review	Perspectives in Psychiatric Care
73	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
74	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
75	Gerrits, R S	2007	Master your mood online: A preventive chat group intervention for adolescents	AeJAMH (Australian e-Journal for the Advancement of Mental Health)
76	Gibbel, M R	2011	Evaluating a spiritually integrated intervention for depressed college students	Dissertation Abstracts International: Section B: The Sciences and Engineering
77	Gladstone, T	2014	Understanding adolescent response to a technology-based depression prevention program	Journal of Clinical Child and Adolescent Psychology
78	Griffiths, K M	2012	The effectiveness of an online support group for members of the community with depression: a randomised controlled trial	PLoS ONE [Electronic Resource]
79	Griffiths, K M	2010	The efficacy of internet interventions for depression and anxiety disorders: a review of	Medical Journal of Australia

			randomised controlled trials (Structured abstract)	
80	Griffiths, K M	2009	Systematic review on Internet Support Groups (ISGs) and depression (1): Do ISGs reduce depressive symptoms?	Journal of Medical Internet Research
81	Griffiths, K M	2009	Systematic review on Internet Support Groups (ISGs) and depression (2): What is known about depression ISGs?	Journal of Medical Internet Research
82	Griffiths, K M	2007	Internet-based mental health programs: a powerful tool in the rural medical kit	Australian Journal of Rural Health
83	Griffiths, K M	2006	Review of randomised controlled trials of Internet interventions for mental disorders and related conditions	Clinical Psychologist
84	Griffiths, K M	2004	Effect of web-based depression literacy and cognitive-behavioural therapy interventions on stigmatising attitudes to depression - Randomised controlled trial	British Journal of Psychiatry
85	Gun, S Y	2011	Acceptability of Internet treatment of anxiety and depression	Australasian Psychiatry
86	Hadjistavropoulos, H D	2012	Dissemination of therapist-assisted internet cognitive behaviour therapy: development and open pilot study of a workshop	Cognitive Behaviour Therapy
87	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
88	Hailey, D	2008	The effectiveness of telemental health applications: a review	Canadian Journal of Psychiatry - Revue Canadienne de Psychiatrie
89	Hedman, E	2014	Effectiveness of Internet-based cognitive behaviour therapy for depression in routine psychiatric care	Journal of Affective Disorders

90	Hedman, E	2012	Cognitive behavior therapy via the Internet: a systematic review of applications, clinical efficacy and cost-effectiveness	Expert Review of Pharmacoeconomics & Outcomes Research
91	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
92	Hilvert-Bruce, Z	2012	Adherence as a determinant of effectiveness of internet cognitive behavioural therapy for anxiety and depressive disorders	Behaviour Research and Therapy
93	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 [Electronic Resource]
94	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
95	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
96	Hoifodt, R S	2011	Effectiveness of cognitive behavioural therapy in primary health care: a review	Family Practice
97	Hollandare, F	2013	Two-year outcome of internet-based relapse prevention for partially remitted depression	Behaviour Research and Therapy
98	Hollandare, F	2011	Randomized trial of Internet-based relapse prevention for partially remitted depression	Acta Psychiatrica Scandinavica
99	Hollinghurst, S	2010	Cost-effectiveness of therapist-delivered online cognitive-behavioural therapy for	British Journal of Psychiatry

			depression: randomised controlled trial	
100	Hunkeler, E M	2012	A web-delivered care management and patient self-management program for recurrent depression: a randomized trial	Psychiatric Services
101	Iloabachie, C	2011	Adolescent and parent experiences with a primary care/Internet-based depression prevention intervention (CATCH-IT)	General Hospital Psychiatry
102	Jacmon, J	2009	Treatment of major depression: Effectiveness of cognitive-behavioural therapy with an internet course as a central component	E-Journal of Applied Psychology
103	Johansson, R	2013	Affect-focused psychodynamic psychotherapy for depression and anxiety through the Internet: a randomized controlled trial	PeerJ
104	Johansson, R	2013	Personality change after Internet-delivered cognitive behavior therapy for depression	PeerJ
105	Johansson, R	2013	Choosing between Internet-based psychodynamic versus cognitive behavioral therapy for depression: a pilot preference study	BMC Psychiatry
106	Johansson, R	2012	Internet-based psychological treatments for depression	Expert Review of Neurotherapeutics
107	Johansson, R	2012	Psychodynamic guided self-help for adult depression through the internet: a randomised controlled trial	PLoS ONE [Electronic Resource]
108	Johansson, R	2012	Tailored vs. standardized internet-based cognitive behavior therapy for depression and comorbid symptoms: a randomized controlled trial	PLoS ONE [Electronic Resource]
109	Johnston, L	2014	Exploring the efficacy and acceptability of Internet-delivered cognitive behavioural therapy for young adults with	Australian and New Zealand Journal of Psychiatry

			anxiety and depression: An open trial	
110	Jones, R B	2013	Recruitment to online therapies for depression: pilot cluster randomized controlled trial	Journal of Medical Internet Research
111	Jones, R B	2012	Accuracy of geographically targeted internet advertisements on Google AdWords for recruitment in a randomized trial	Journal of Medical Internet Research
112	Kaltenthaler, E	2008	Computerised cognitive-behavioural therapy for depression: systematic review	British Journal of Psychiatry
113	Kaltenthaler, E	2008	The acceptability to patients of computerized cognitive behaviour therapy for depression: a systematic review	Psychological Medicine
114	Kelders, S M	2013	Participants, usage, and use patterns of a web-based intervention for the prevention of depression within a randomized controlled trial	Journal of Medical Internet Research
115	Kelders, S M	2013	Development of a web-based intervention for the indicated prevention of depression	BMC Medical Informatics and Decision Making
116	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
117	Kenter, R	2013	Guided online treatment in routine mental health care: an observational study on uptake, drop-out and effects	BMC Psychiatry
118	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
119	Kessler, D	2009	Therapist-delivered internet psychotherapy for depression in primary care: a randomised	Lancet

			controlled trial	
120	Kojima, R	2010	Efficacy of Cognitive Behavioral Therapy Training Using Brief E-mail Sessions in the Workplace: A Controlled Clinical Trial	Industrial Health
121	Krusche, A	2013	Mindfulness online: an evaluation of the feasibility of a web-based mindfulness course for stress, anxiety and depression	BMJ Open
122	Kurki, M	2013	Integration of computer and Internet-based programmes into psychiatric out-patient care of adolescents with depression	Informatics for Health & Social Care
123	Kurki, M	2011	Usefulness of Internet in adolescent mental health outpatient care	Journal of Psychiatric and Mental Health Nursing
124	Lal, S	2014	E-mental health: a rapid review of the literature	Psychiatric Services
125	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
126	Lemma, A	2013	Feasibility study of a psychodynamic online group intervention for depression	Psychoanalytic Psychology
127	Levin, M E	2014	Feasibility of a Prototype Web-Based Acceptance and Commitment Therapy Prevention Program for College Students	Journal of American College Health
128	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
129	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
130	Lintvedt, O K	2013	Evaluating the translation process of an Internet-based self-help intervention for prevention of	Journal of Medical Internet Research



			depression: a cost-effectiveness analysis	
131	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
132	Lintvedt, O K	2008	The need for web-based cognitive behavior therapy among university students	Journal of Technology in Human Services
133	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
134	Mackinnon, A	2008	Comparative randomised trial of online cognitive-behavioural therapy and an information website for depression: 12-month outcomes	British Journal of Psychiatry
135	Mailey, E L	2010	Internet-delivered physical activity intervention for college students with mental health disorders: a randomized pilot trial	Psychology, Health & Medicine
136	Makarushka, M M	2012	Efficacy of an Internet-based intervention targeted to adolescents with subthreshold depression	Dissertation Abstracts International Section A: Humanities and Social Sciences
137	Mallen, M J	2011	Online counselling: An initial examination of the process in a synchronous chat environment	Counselling & Psychotherapy Research
138	Maloni, J A	2013	Web Recruitment and Internet Use and Preferences Reported by Women With Postpartum Depression After Pregnancy Complications	Archives of Psychiatric Nursing
139	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
140	Marko, M	2010	Adolescent Internet depression prevention: Preferences for intervention and predictors of	Journal of CyberTherapy and Rehabilitation

			intentions and adherence	
141	McNaughton, J L	2009	Brief interventions for depression in primary care: a systematic review	Canadian Family Physician
142	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 [Electronic Resource]
143	Meyer, B	2009	Effectiveness of a novel integrative online treatment for depression (Deprexis): randomized controlled trial	Journal of Medical Internet Research
144	Meyer, D	2007	Online self-help: developing a student-focused website for depression... www.studentdepression.org	Counselling & Psychotherapy Research
145	Mogoase, C	2013	Can concreteness training alone reduce depressive symptoms? A randomized pilot study using an internet-delivered protocol	Cognitive Therapy and Research
146	Mohr, D C	2013	A randomized controlled trial evaluating a manualized TeleCoaching protocol for improving adherence to a web-based intervention for the treatment of depression	PLoS ONE [Electronic Resource]
147	Mohr, D C	2010	Multimodal e-mental health treatment for depression: a feasibility trial	Journal of Medical Internet Research
148	Mohr, D C	2010	Interest in behavioral and psychological treatments delivered face-to-face, by telephone, and by internet	Annals of Behavioral Medicine
149	Mongrain, M	2012	Do Positive Psychology Exercises Work? A Replication of Seligman et al. ()	Journal of Clinical Psychology
150	Mora, L	2008	Psychologist treatment recommendations for Internet-based therapeutic interventions	Computers in Human Behavior
151	Morgan, A J	2013	Internet-based recruitment to a depression prevention	Journal of Medical Internet Research

			intervention: lessons from the Mood Memos study	
152	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
153	Morgan, A J	2013	Behavior change through automated e-mails: Mediation analysis of self-help strategy use for depressive symptoms	Behaviour Research and Therapy
154	Morgan, A J	2012	Email-based promotion of self-help for subthreshold depression: Mood Memos randomised controlled trial	British Journal of Psychiatry
155	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
156	Moritz, S	2012	A randomized controlled trial of internet-based therapy in depression	Behaviour Research and Therapy
157	Mota Pereira, J	2014	Facebook Enhances Antidepressant Pharmacotherapy Effects	Scientific World Journal
158	Mureşan, Vlad	2012	Emotional Outcomes and Mechanisms of Change in Online Cognitive-Behavioral Interventions: A Quantitative Meta-Analysis of Clinical Controlled Studies	Journal of Technology in Human Services
159	Naversnik, K	2013	Cost-effectiveness of a novel e-health depression service	Telemedicine Journal and e-Health
160	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
161	Newby, J M	2013	Internet cognitive behavioural therapy for mixed anxiety and depression: a randomized controlled trial and evidence of effectiveness in primary care	Psychological Medicine

162	Newman, M G	2011	A review of technology-assisted self-help and minimal contact therapies for anxiety and depression: is human contact necessary for therapeutic efficacy?	Clinical psychology review
163	Nordgreen, T	2011	Use of self-help materials for anxiety and depression in mental health services: A national survey of psychologists in Norway	Professional Psychology: Research and Practice
164	O'Kearney, R	2009	A controlled trial of a school-based Internet program for reducing depressive symptoms in adolescent girls	Depression and Anxiety
165	O'Kearney, R	2006	Effects of a cognitive-behavioural internet program on depression, vulnerability to depression and stigma in adolescent males: a school-based controlled trial	Cognitive Behaviour Therapy
166	O'Mahen, H A	2013	Netmums: a phase II randomized controlled trial of a guided Internet behavioural activation treatment for postpartum depression	Psychological Medicine
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183	Richards, D	2013	A comparison of two online cognitive-behavioural interventions for symptoms of depression in a student population: The role of therapist responsiveness	Counselling & Psychotherapy Research
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202	Shapira, L B	2010	The benefits of self-compassion and optimism exercises for individuals vulnerable to	The Journal of Positive Psychology

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203	Sharry, J	2013	A service-based evaluation of a therapist-supported online cognitive behavioral therapy program for depression	Journal of Medical Internet Research
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218	Talbot, F	2012	Client Contact in Self-Help Therapy for Anxiety and Depression: Necessary But Can Take a Variety of Forms Beside Therapist Contact	Behaviour Change
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220	Titov, N	2013	Improving adherence and clinical outcomes in self-guided internet treatment for anxiety and depression: randomised controlled trial	PLoS ONE [Electronic Resource]
221	Titov, N	2011	Transdiagnostic internet treatment for anxiety and depression: a randomised controlled trial	Behaviour Research and Therapy
222	Titov, N	2010	Internet treatment for depression: a randomized controlled trial	PLoS ONE [Electronic Resource]

			comparing clinician vs. technician assistance	
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226	van der Zanden, R	2013	Online cognitive-based intervention for depression: exploring possible circularity in mechanisms of change	Psychological Medicine
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235	Van Voorhees, Benjamin W	2010	Adolescents in primary care with sub-threshold depressed mood screened for participation in a depression prevention study: Comorbidity and factors associated with depressive symptoms	The Open Psychiatry Journal
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237	Vangberg, H C	2012	Does Personality Predict Depression and Use of an Internet-Based Intervention for Depression among Adolescents?	Depression Research and Treatment
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243	Warmerdam, L	2013	Predicting outcome of Internet-based treatment for depressive symptoms	Psychotherapy Research
244	Warmerdam, L	2010	Cost-utility and cost-effectiveness of internet-based treatment for adults with depressive symptoms: randomized trial (Provisional abstract)	Journal of Medical Internet Research
245	Warmerdam, L	2010	Online cognitive behavioral therapy and problem-solving therapy for depressive symptoms: Exploring mechanisms of change	Journal of Behavior Therapy and Experimental Psychiatry
246	Warmerdam, L	2008	Internet-based treatment for adults with depressive symptoms: randomized controlled trial	Journal of Medical Internet Research
247	Watkins, D C	2011	Email reminders as a self-management tool in depression: a needs assessment to determine patients' interests and preferences	Journal of Telemedicine and Telecare
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251	Williams, A D	2013	The effectiveness of Internet cognitive behavioural therapy (iCBT) for depression in primary care: a quality assurance study	PLoS ONE [Electronic Resource]
252	Williams, A D	2013	Combining imagination and reason in the treatment of	Journal of Consulting and Clinical Psychology

			depression: a randomized controlled trial of internet-based cognitive-bias modification and internet-CBT for depression	
253	Williams, A D	2013	The impact of psychological distress tolerance in the treatment of depression	Behaviour Research and Therapy
254	Wojtowicz, M	2013	Predictors of participant retention in a guided online self-help program for university students: prospective cohort study	Journal of Medical Internet Research
255	Woodford, J	2011	Recruitment into a guided internet based CBT (iCBT) intervention for depression: lesson learnt from the failure of a prevalence recruitment strategy	Contemporary Clinical Trials

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## Appendix D: Final template

1. Program Promotion/User recruitment (K=90)
  - 1.1 Advertisements (k = 82)
    - 1.1.1 Online (k= 39)
    - 1.1.2 Newspaper (k = 27)
    - 1.1.3 Brochures (k=7)
    - 1.1.4 Other (k=11)
2. Program Referral (K=29)
  - 2.1 Primary care (k=24)
    - 2.1.1 General practitioner (k=12)
      - 2.1.1.1 Risk-of-disorder screening (k=4)
  - 2.2 Secondary care (k=7)
    - 2.2.1 Psychologists (k=2)
  - 2.3 Other (k=2)
3. Training: (K=37)
  - 3.1 Scope (K=9)
    - 3.1.1 Content of the program (k=4)
    - 3.1.2 Internet-related therapeutic skills (k=4)
    - 3.1.3 Other (k=1)
  - 3.2 Method (K=20)
    - 3.2.1 Manual (k=10)
      - 3.2.1.1 User (k=6)
      - 3.2.1.2 Practitioner (k=4)
    - 3.2.2 Briefing (k=3)
    - 3.2.3 Video demonstration (k=2)
    - 3.2.3 Lecture (k=3)
    - 3.2.4 Other (k=2)
  - 3.4 Length (K=12)
    - 3.4.1 Less than one day of training (k=8)
    - 3.4.2 One day of training (k=1)
    - 3.4.3 More than one day of training (k=3)
- 4.1 Supervision of practitioners (K=39)
  - 4.1.1 Format (k=7)
    - 4.1.1.1 Group Supervision (k=5)
    - 4.1.1.2 Other (k=2)
  - 4.1.2 Content (k=10)
    - 4.1.2.1 Monitor treatment integrity and fidelity (k=4)
    - 4.1.2.2 Monitor user progress (k=2)
    - 4.1.2.3 Other (k=4)
  - 4.1.3 Supervisor(s) (k=16)
    - 4.1.3.1 Authors (k=5)
    - 4.1.3.2 Experienced therapist(s) (k=11)
  - 4.1.4 Schedule (k=18)

- 4.1.4.1 Continuous (k=17)
- 4.2 Support of users (K=27)
  - 4.2.1 Administrative or technical support (non-therapeutic) (k=24)
  - 4.2.2 Other (k=3)
- 5. Performance assessments (K=9)
  - 5.1 Treatment integrity and adherence to treatment manual (k=8)
  - 5.2 Other (k=1)
- 6. Administrative/technical support (K=5)
  - 6.1 Personnel support (k=2)
- 7. External cooperation (K=5)
  - 7.1 Support from outside (k=2)
  - 7.2 Other (k=2)