Implementation of Internet Interventions for Depression

A Scoping Review

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Abstract

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Background: Evidence for the efficacy of web-based treatments for depression has increased substantially the last few years. However, many of these programs obtain poor effect sizes or fail to become a part of routine practice. Such issues could be due to a knowledge gap on how these interventions should be implemented. *Objective:* The primary aim of this study is to examine what is known from the existing literature about implementation of internet interventions for depression. *Method:* A systematic scoping review of English and Scandinavian-language articles was carried out on 12 databases. Additional papers were identified by contacting relevant societies, as well as hand-searching journals and reference lists. Only empirical studies on internet-based interventions for depression were included. Relevant articles were subjected to a directed content analysis, using May and Finch's (2009) Normalization Process Theory (NPT) as a theoretical framework to identify implementation information. *Results:* 7 076 citations were identified and screened for relevance, resulting in 255 full-text articles on internet interventions for depression, of which 51 % were relevant to the implementation framework (N = 130). Content analysis revealed that there was a substantial lack of reporting on implementation. Furthermore, researchers tend to use a non-systematic approach when reporting on implementation and often fail to consider the different organizational levels involved in putting an intervention into practice. *Conclusion:* The review identified considerable knowledge gaps in the literature. These findings indicate that the field of internet interventions for depression require a great deal of research on implementation, especially in areas that relate to other levels than intervention users.

Keywords: internet interventions, depression, implementation, Normalization Process Theory

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Table of Contents

Introduction

Depression is a common mental disorder, with more than 350 million people affected worldwide (World Health Organization, 2012). It is currently among the most prevalent lifetime disorders and is estimated to contribute to the highest disease burden in high-income countries by 2030 (Kessler et al., 2005; Mathers & Loncar, 2006). Without treatment, depression has a tendency to become chronic, and over time can lead to greater disability (Moussavi et al., 2007). Depression is linked to a range of problems, such as sleep difficulties (Tsuno, Besset, & Ritchie, 2005), poorer quality of life (Saarni et al., 2007), increased mortality (Cuijpers & Smit, 2002) and a highly elevated risk of suicidal behavior (Beautrais et al., 1996).

Despite the existence of a number of effective treatments such as cognitive behavioral therapy (CBT) (Butler, Chapman, Forman, & Beck, 2006) and psychopharmacology (Khan, Faucett, Lichtenberg, Kirsch, & Brown, 2012), a substantial amount of people suffering from depression do not seek treatment (Wang et al., 2007). Lack of treatment seeking could be explained by factors such as high amounts of fatigue or lack of energy by sufferers of depression (Demyttenaere, De Fruyt, & Stahl, 2005), as well as common barriers to treatment, such as fear of stigma, lack of time for treatment, inadequate access to providers and mobility difficulties due to the severity of the disorder (Collins, Westra, Dozois, & Burns, 2004). One way of overcoming these barriers could be through the use of internet-based treatment for depression. Advantages of internet-based treatment include anonymity, being able to avoid stigma by seeing a therapist, obtaining treatment at any time, as well as being able to reach people through the internet who might not be able to access treatment otherwise (Spek et al., 2007).

In the last few years there has been increasing evidence for the efficacy of internet interventions for treating depression (Andersson & Cuijpers, 2009; Foroushani, Schneider, & Assareh, 2011; So et al., 2013; Spek et al., 2007). A recent meta-analysis of 18 web-based psychological interventions found a medium effect on the reduction in depression compared to controls (Cowpertwait & Clarke, 2013). Another review of 19 studies on web-based interventions for anxiety and depression found that 13 reported positive effects in terms of reducing rates of anxiety and depression compared to controls (Paul, Carey, Sanson-Fisher, Houlcroft, & Turon, 2013). Despite promising findings, not all of these interventions are effective or manage to achieve significant effect sizes. Moreover, numerous e-health projects end when research concludes and fail to become part of mainstream clinical care (Murray,

2012). Many researchers attribute these issues to a gap in knowledge of how to implement new methods in regular care (Murray et al., 2010), leading to calls for more research that explores implementation processes.

Some researchers have focused on implementation in relation to internet interventions for depression. Authors such as Andersson et al. (2008) and Hadjistavropoulos et al. (2011) describe "lessons learned" in the delivery of CBT-interventions over the internet, concerning such topics as recruitment, therapist training, costs and other practical issues. One paper outlined the researchers' experiences in training students into putting interventions into clinical practice (Hadjistavropoulos, Thompson, Klein, & Austin, 2012) and another provided a case report to illustrate the clinical considerations involved in delivering the intervention to patients (Kersting, Kroker, Schlicht, & Wagner, 2011). These papers can provide an insight into how internet-based treatment can be implemented, but as they are not based on any established frameworks or models, one can not be certain whether they cover the most important aspects outlined by implementation theories.

The work involved in implementing an intervention into regular practice can be a complex and time-consuming procedure (Stroetmann et al., 2011). In order to develop better interventions, theories are needed to enhance the understanding of this complicated process (McEvoy et al., 2014). Moreover, the utilization of theory can help prevent "type III error", that is "failing to find intervention effectiveness because the program is poorly designed or implemented" (Bartholomew, Parcel, Kok, Gottlieb, & Fernandez, 2011, p. 8). Various theories have been developed which outline factors that may contribute to successful implementation (Grol & Wensing, 2004). Among these theories are the Diffusion of Innovations Theory (Rogers, 2003), the Active Implementation Framework (Fixsen, Naoom, Blase, & Friedman, 2005), the RE-AIM Framework (Glasgow, Vogt, & Boles, 1999) and several others.

In order to improve the probability of implementing successful interventions in practice, Ferlie and Shortell (2001) suggest that one should consider four "levels of change": the individual, the group or team, the overall organization and the larger system in which organizations are embedded. However, a great number of implementation theories have limited themselves to emphasize only one or very few levels (Tabak, Khoong, Chambers, & Brownson, 2012). For instance, some theories focus on the behavior of individuals (e.g. the Theory of Planned Behavior), whereas other theories focus solely on processes within the organizational or community level (e.g. Diffusion of Innovations in Service Organizations). Thus, in order to gain a comprehensive overview of all relevant aspects of the implementation

process, there is a need for a theoretical framework that covers multiple levels of implementation.

The Normalization Process Theory (NPT; May & Finch, 2009; Murray et al., 2010) encourages a whole-system perspective on the implementation process, meaning that a wide range of levels are taken into account. As the authors point out:

> An intervention that appears to affect only one individual or group may, on closer inspection, require a successful chain of interactions. NPT will not solve these problems, but it can help to identify how links between participants may be affected by the intervention and how the intervention might be modified to support these interactions. This is, we believe, a clear strength of NPT compared to other approaches to implementation, which tend to focus principally on the needs of one professional group or level at a time, with less consideration given to the wider system issues (Murray et al., 2010, p. 8)

Moreover, the NPT has been suggested as a way to bridge the aforementioned knowledge gap by identifying barriers to implementation, thereby allowing implementers to focus their efforts on areas that are likely to become problematic (Morrison & Mair, 2011). The theory would be particularly well suited to the study of internet interventions for depression, as it has been used previously to explore the implementation of e-health initiatives (Mair et al., 2007; Murray et al., 2011). One systematic review has been published using the NPT to study the implementation of e-health systems (Mair et al., 2012). However, no reviews have attempted to use the theory in relation to internet interventions for depression, and perhaps even more importantly, no reviews to date have focused on the literature on implementation of internet interventions for depression. This highlights the need for a comprehensive, systematic review that explores the knowledge on online depression programs and how these are implemented. The following text will be an attempt to fulfill this need. First, an outline of the NPT will be presented, succeeded by a brief definition of implementation and associated terms, and finally the research aim of this study.

The Normalization Process Theory

May and Finch (2009) describe the NPT as an explanatory framework for investigating the routine embedding of material practices in their social contexts. In other words, the theory is concerned with how practices are made routine elements of everyday life and how these practices are integrated into a social setting. In the case of internet

interventions for depression, a *practice* may refer to the utilization of an intervention. By *normalization*, the authors mean

> the work that actors do as they engage with some ensemble of activities (that may include new or changed ways of thinking, acting, and organizing) and by which means it becomes routinely embedded in the matrices of already existing, socially patterned, knowledge and practices (May & Finch, 2009, p. 540)

Interventions can be said to be normalized as a result of individual and collective work to enact them in everyday practice. This enacting is promoted or enhanced through the operation of four core categories: Coherence, Cognitive Participation, Collective Action and Reflexive Monitoring (May et al., 2007). These categories are in turn divided into sixteen sub-categories (i.e. four sub-categories for each one of the core categories). Due to their importance to this study, each category will be defined below, as outlined by May and Finch (2009). See Appendix D for a full overview of the NPT framework.

Coherence. The process of making sense of a new practice is referred to as *Coherence,* which involves the process of understanding that individuals and organizations have to go through to promote the integration of that practice into everyday routines. The assumption is that the implementation of a practice is made possible by a set of ideas about its meaning, uses and utility. These ideas help sustain the practice and makes it possible to share and enact it. In the context of internet interventions, this could refer to how users or clinicians involved in a self-help program for depression are able to comprehend the purpose of the program and how they are going to use it. Coherence is divided into four sub-categories: differentiation, individual specification, communal specification and internalization. The first sub-category, *differentiation*, refers to the understanding of how a practice and its associated components are different from each other. The second, *individual specification*, concerns whether individuals have a personal understanding of the tasks and responsibilities associated with the intervention. Third, *communal specification* concerns whether individuals have a shared understanding among each other of the tasks and responsibilities associated with the intervention. Finally, *internalization* denotes the understanding of values, benefits and importance of an intervention.

Cognitive Participation. The process of engaging in a new set of practices is known as *Cognitive Participation*. This might more widely be described as both real and symbolic participation in a way that prepares people for the efforts involved in making the intervention happen. When a new practice is introduced, individuals must be willing to participate in order

for it to be properly integrated in their everyday practice. Furthermore, there must be a shared agreement on a group level in order for it to be enacted. To use another example, a clinician offered to participate in a therapist-administered online intervention must be willing to commit to the program and recommend it to users. Cognitive Participation is divided into four categories: legitimation, enrolment, initiation and activation. *Legitimation* refers to a sense of believing it is right to be involved in a new practice. *Enrolment* concerns the ways people prepare themselves to make a shared contribution to the new practice. *Initiation* refers to the ability and willingness of key individuals to get others involved in the new practice. *Activation* denotes the actions and procedures needed to stay involved in a practice over time.

Collective Action. The effort that is exerted in order to enact a new set of practices is known as *Collective Action*. Often, a new practice will involve a new set of tasks and responsibilities which will induce individuals and groups to reshape behaviors, reorganize relationships or employ new procedures. This effort will require people to mobilize skills and resources in order for the new practice to be carried out. In terms of internet interventions, a user of a treatment program for depression might need to employ all her computer skills in order to fully utilize the intervention. Collective Action is divided into four categories: skill set workability, contextual integration, interactional workability and relational integration. *Skill set workability* denotes the way the new practice fits with existing working practices, skill sets, job roles and training needs. *Contextual integration* describes the overall suitability of the new practice with existing practices. *Interactional workability* refers to the influence of the new practice on the interaction between people. *Relational integration* concerns how the practice fits with existing relationships among groups.

Reflexive Monitoring. The formal and informal evaluations of a practice is known as *Reflexive Monitoring*. This is a process which is assumed to be continuously ongoing. The evaluations may involve appraisals about the usefulness and effectiveness of the new practice, which can be based on either personal or shared beliefs. Evaluations can also result in actions that can shape the practice in new directions. To illustrate this construct in relation to internet interventions: a practitioner of an internet-based CBT program might perceive it as having no effect on his users and report this to the program developers. Reflexive Monitoring is divided into four categories: systematization, individual appraisal, communal appraisal and reconfiguration. *Systematization* refers to the various ways evaluation information is gathered. *Individual appraisal* concerns individuals' evaluation of a practice. *Communal appraisal*

concerns the way groups evaluate a new practice. *Reconfiguration* denotes the workarounds that people attempt when they perceive that the intervention is not working.

Implementation

The term implementation may be defined as "the social organization of bringing a practice or practices into action" (May et al., 2009, p. 2). It should be pointed out, however, that this is just one of many possible ways to define implementation. In the case of this study, the "practice" refers to any web-based intervention designed to prevent or treat depression in some way, whereas the "social organization" refers to the individual and collective efforts to embed that intervention at the organizational, group, practitioner or user level. The term "practitioner" is used here to denote a clinician or other person providing health services to users, and "users" refers to the consumer who utilizes the intervention.

Research Aim

The overall aim of the study was to examine what is known from the existing literature about implementation of internet interventions for depression. Knowledge derived from the research aim could help advance research on implementation processes, as well as aid existing interventions in becoming more effective. The NPT was used as a theoretical framework, utilizing the sub-categories Coherence, Cognitive Participation, Collective Action and Reflexive Monitoring as the basis for coding. The aim was specified into two questions: 1) Are there any systematic differences in the reporting of implementation of internet interventions for depression, as coded onto the Normalization Process Theory? 2) What characterizes the existing literature and knowledge on Coherence, Cognitive Participation, Collective Action and Reflexive Monitoring, respectively, for the implementation of internet interventions for depression?

Methods

Study Design

A paper from the Centre for Reviews and Dissemination at the University of York outlines a methodological framework for carrying out scoping reviews (Arksey & O'Malley, 2005). According to the "York framework" a scoping review is distinct from a systematic review in the sense that it attempts to provide answers from a wide range of papers, as well as aiming to identify gaps in the literature. A systematic review, on the other hand, often centers on a more limited amount of papers, often with an emphasis on quality assessment of the

included studies. In that sense, this review is different from a systematic review, in that it attempts to cover the entire field of internet interventions for depression in order to identify significant research gaps. The framework outlines five stages required in a scoping review: 1) identifying the research question, 2) identifying relevant studies, 3) study selection, 4) charting the data and 5) summarizing and reporting the results. The four latter stages of the framework are outlined below.

Search Strategy

A systematic literature search for internet-based interventions for depression was performed in March 2014 by a librarian employed at RBUP. In total, 12 databases were searched, including Cinahl, ClinicalTrials.gov, Cochrane, Embase, Google Scholar, International Standard Randomised Controlled Trial Number Register (ISRCTN), OpenGrey, Ovid MEDLINE(r), PsychINFO, PubMed, Web of Science and WHO International Clinical Trials Registry Platform (ICTRP). No restriction regarding publication date was used. The search strategy focused on three core elements: 1) internet (e.g. “online*” or “web*”), 2) interventions (e.g. “intervent*” OR “program*”) and 3) depression (e.g. “depress* OR “depressive symptoms”). All journals that were searchable in the databases were included (peer-reviewed, non-peer-reviewed etc.). Three of the databases, ClinicalTrials, ISRCTN and ICTRP, are databases for registering clinical trials. As they only provide information about ongoing trials, they did not render any empirical information. Nevertheless, they were included in order to achieve a more complete summary of the research on internet interventions for depression. See Appendix A for the full search strategy.

The search strategy initially included a fourth element on implementation (“implement*”). However, this approach provided an outcome of about 40 000 citations. Random sampling showed that the vast majority of these articles were irrelevant to the research objective. Considering how a review of such a great number of citations would not be possible within the timeframe of this project, the term “implementation” was removed from the search strategy in order to obtain a more manageable outcome. The final search strategy would ideally cover all articles on internet interventions for depression, irrespective of whether they were about implementation or not. Consequently, the search output would not lose any information about implementation in internet interventions studies for depression. As opposed to locating implementation information directly through the search process, the relevant information would rather be identified in the coding process.

Subsequent to the database search, two raters (the author and a fellow student) examined the journals that were most frequently represented in the search results. Journals such as BMC Psychiatry, Journal of Medical Internet Research and PloS ONE were investigated to see whether Medline's search engine had missed any relevant articles. Additionally, journals known to be associated with research on implementation, such as Implementation Science, Journal of Applied Psychology and The Journal of Primary Prevention were examined by the same raters. Furthermore, a call for articles was e-mailed to members of The European Society of Internet Research (ESRII; www.esrii.org) and The International Society for Research on Interventions (ISRII; www.isrii.org). When all literature searches were finished, the raters hand-searched the reference lists of all identified meta-analyses and systematic reviews in order to find any articles that might have been overlooked.

Screening Search Results

All results were downloaded into the reference manager software Mendeley Desktop 13.1 (Mendeley Ltd., 2015) and screened independently by the two raters. The screening process was divided into two separate stages. First, the raters screened the full set of citations based on information from the title, abstract and keywords. Because relevance was sometimes difficult to determine on the basis of such limited amounts of information, the raters included citations in which there was uncertainty, in order to avoided excluding relevant articles. The second stage of the screening process involved retrieving all included articles in full text in order to make a final decision. The same criteria were used for both phases of the screening process, meaning that the article was included if it 1) concerned some form of intervention, 2) the intervention was internet-based, and 3) depression was the primary problem or disorder which the study or intervention addressed. No criteria regarding language was employed during the screening process. This was done in order to avoid missing any papers relevant to the research question. See Appendix B for the complete list of inclusion and exclusion criteria.

For the purpose of this review, an "internet intervention" was defined as a program that "attempts to create positive change and or improve/enhance knowledge, awareness, and understanding via the provision of sound health-related material and use of interactive web-based components" (Barak, Klein, & Proudfoot, 2009, p. 5). Programs that fit this definition might refer to therapy, prevention, promotion or education interventions. References containing screening tools for depression, questionnaires or experimental procedures, were considered irrelevant for this scoping review as they did not fit the intervention definition. As

for depression, papers were included if depression was the main focus of the intervention, regardless of whether the target group had a diagnosis of depression or were just suffering from depressive symptoms. However, if depressive symptoms were measured, but were not the primary focus of the intervention, the paper was not included. This was most often encountered with interventions directed towards anxiety or bipolar disorder.

Despite using a comprehensive and specific list of criteria for inclusion, some issues were not covered by the list of inclusion criteria and had to be resolved by consulting with a researcher with comprehensive insight to the field of internet interventions. Based on communication with the researcher in question, papers were excluded if they were 1) editorials, conference papers, methodological papers or protocols, 2) concerned with phenomena closely linked to depression, but not focused solely on depression, such as suicide, grief or loss, 3) concerned with physical disorders such as diabetes, cancer or multiple sclerosis, in which depression was a secondary problem linked to the disease, 4) concerned with non-depressed individuals, such as family members of the depressed.

To ensure consistency between the raters, inter-rater reliability was calculated at the end of both stages of the screening process. Cohen's Kappa was used to measure the inter-rater reliability. The raters obtained a value of $k = .65$ (95 % CI .61-.69), $p < .001$ for the first stage that involved screening the total amount of citations, and a value of $k = .82$ (95 % CI .78-.87), $p < .001$ for the second stage that involved screening of included articles in full text. Values between .61 and .80 indicate that there is a substantial agreement between raters, whereas a value between .81 and 1.0 means that the agreement is almost perfect (Landis & Koch, 1977). Consequently, the level of agreement between raters was viewed as acceptable.

A third rater randomly sampled 10% of the excluded references by both raters, respectively, from the original selection of search results. Thus, the a random sample consisted of 1180 (17,7 %) references which were compared to the selection of included and excluded articles made by the two raters. This was done to assess the validity of the screening and to ensure that no relevant references were omitted. Seeing how this is a scoping review which aims to cover the breadth of the research literature, it is considered better to include an irrelevant reference rather than to exclude a relevant reference. More than 99,3% of references were correctly classified. Consequently, the results were considered as valid, covering most of the existing literature on internet interventions for depression.

Analysis

A mixed-methods approach was used, meaning that data were analyzed both quantitatively and qualitatively. All data material was subjected to unitizing, coding and quantifying information from the references before it was analyzed. Qualitative data were submitted to a directed content analysis, while the quantitative data was analyzed using chi-square tests.

Unitizing. Unitizing referred to identifying statements that were relevant to implementation in some way. In the context of this review, a statement was defined as the smallest meaningful unit that expresses a logical, consistent and distinct viewpoint, which is relevant for implementation. A statement might be part of a sentence, an entire sentence or several sentences. A statement should be large enough to carry meaning, while at the same time small enough to not contain more than one set of meanings. Statements were distinct from "meaning units", which are defined in the section on coding below. In the present study, unitizing and initial coding was done concurrently. All references included in the screening process were retrieved and examined in full text by the two raters. Text from each article was unitized if it was relevant to implementation.

Coding. The NPT served as the basis of coding. Based on the published work describing the NPT, a coding framework was developed containing the core categories of the theory (see Appendix C). In order to keep with the recommended multi-level approach of the NPT described by Murray et al. (2010), an adapted version Ferlie and Shortell's (2001) four levels of change was added to the coding framework. All statements were coded in relation to users, practitioners or supervisors (the individual level); teams, groups, leadership or management (the group level); the organization in which the intervention is set (the organizational level); or as a residual, for all statements that did not fit with either of the aforementioned level codes (including the larger system level).

The two raters studied the coding framework and developed a coding scheme to guide the process of unitizing and coding. The coding scheme contained four steps:

1. Read through the article and identify relevant information that deals with facilitators or barriers to implementation (unitizing).
2. Take each piece of information and compare it to the core categories of the NPT, as formulated in the coding framework.
3. If the formulation fits one of the four categories, compare it to one of the associated sub-categories of the given core category and code it accordingly. If the formulation is

relevant, yet does not fit into any theoretical construct, code it as a residual. A residual is defined as any piece of information that is relevant, but is not directly compatible with any of the NPT categories.

4. Next, assess each piece of information in terms of organizational level and code it accordingly.

The approach used was Attribute Coding, which involves the coding of "basic descriptive information such as the fieldwork setting, participant characteristics or demographics, data format and other variables" (Saldaña, 2013, p. 261). In this case, the raters coded all descriptive information relevant to implementation. When a statement was identified, it was coded as nominal data and transferred to SPSS (e.g. a formulation might be coded as 1 = NPTCoherence, 4 = Internalization and 0 = User). The resulting information was referred to as a *meaning unit* (or just simply a *unit*), denoting both the set of nominal codes, as well as the statement to which the codes were linked. Each article could contain several meaning units, depending on the number of statements that were identified and coded.

As with the screening process, both raters worked independently on the same set of papers. Having two coders work on the same material can be an advantage, since different individuals can aid the interpretation by providing different insights and interpretations to the material (Saldaña, 2013). At the same time, agreement among coders is of vital importance to content analysis. As Neuendorf (2002) states: "given that a goal of content analysis is to identify and record relatively objective (or at least intersubjective) characteristics of messages, reliability is paramount. Without the establishment of reliability, content analysis measures are useless" (Neuendorf, 2002). Inter-rater reliability was calculated for the nominal data in order to evaluate the consistency between the raters. Cohen's Kappa was used to measure the level of agreement on all four core categories of NPT. The coefficient values were $k = .67$ (95 % CI .52-.82), $p < .001$ for Coherence; $k = .77$ (95 % CI .69-.86), $p < .001$. for Cognitive Participation; $k = .70$ (95 % CI .61-.80), $p < .001$ for Collective Action; and $k = .85$ (95 % CI .79-.91) for Reflexive Monitoring. These values were considered acceptable. Any disagreements were resolved through discussion. An additional researcher served as an arbiter in instances where agreement could not be reached.

Statistical analysis. As opposed to coding, which was performed together with a fellow student, all analysis (both quantitative and qualitative) was performed solely by the author. Articles were the basis for all statistical testing, as the number of relevant articles can easily be compared against the number of non-relevant articles (e.g. 50 papers may contain

information relevant to the NPT, as opposed to 100 that do not). Units on the other hand, are harder to compare, as they do not have a known, finite number of non-relevant units to be compared against (e.g. if one finds 300 relevant units in the 50 NPT-relevant articles, there is no finite set of non-relevant units in the 100 non-relevant articles to compare them to). Hence, units were reserved for the qualitative analysis, whereas articles were used as the basis for quantitative analysis. These were labeled with the nominal data from the attributive coding stage (e.g. one article may be coded as containing Coherence, including internalization, and Reflexive Monitoring, including systematization and individual appraisal) and analyzed using SPSS.

Research question 1 "Are there any systematic differences in the reporting of implementation of internet interventions for depression, as coded onto the Normalization Process Theory?" was approached by plotting out a contingency table of all articles that contained relevance to the NPT, as well as performing two statistical tests. The first test examined whether there was a systematic relationship between the reporting of one NPT category with another (e.g. do authors that report on Coherence-relevant information also report on information that is relevant to Collective Action?). This was analyzed using a chi-square of independence test, with the output values being the Yates' Correction for Continuity and the phi coefficient to indicate correlation. Yate's correction was chosen in order to avoid overestimation of the chi-square value when using a 2x2 table (Field, 2009). The second test utilized a chi-square test for goodness-of-fit in order to examine whether the reporting of each NPT sub-category was equally distributed. A chi-square goodness-of-fit test is used to determine whether the distribution of cases on a categorical variable follows an expected distribution (Pallant, 2010). In this case, the distribution of cases was expected to be equal (e.g. the frequency of reporting was expected to be equal for all the sub-categories of Coherence). The alpha levels were set to .05 and confidence intervals to 95 %.

Qualitative content analysis. Meaning units that resulted from the coding process were analyzed according to the principles of qualitative content analysis (Graneheim & Lundman, 2004). The content analysis approach was chosen because it reduces large amounts of text into smaller categories that are easier to interpret (Flick, 2014). As frequencies and statistical analyses would provide a sufficient overview of the core categories of the NPT, the aim of the qualitative analysis was to provide a general summary of the information contained within each NPT sub-category. In contrast to the theory-based coding process, the qualitative analysis was primarily inductive, meaning that the approach moved from specific instances to

a general whole, as opposed to moving from a general whole to specific instances (Elo & Kyngäs, 2008). Rather than transforming the material into a large set of units, the aim was to reduce the coded data into a small set of themes (within the boundaries of a theory). In this case, the author *condensed* each unit, which refers to "a process of shortening while still preserving the core" (Graneheim & Lundman, 2004, p. 106). For instance, a unit such as "The degree of satisfaction with the intervention program was measured at post-intervention using a questionnaire" might be condensed into "Satisfaction measured with a questionnaire". Subsequently, the condensed units were labeled with a theme, most often a single word, such as "Satisfaction", "Manageability" or "Benefits".

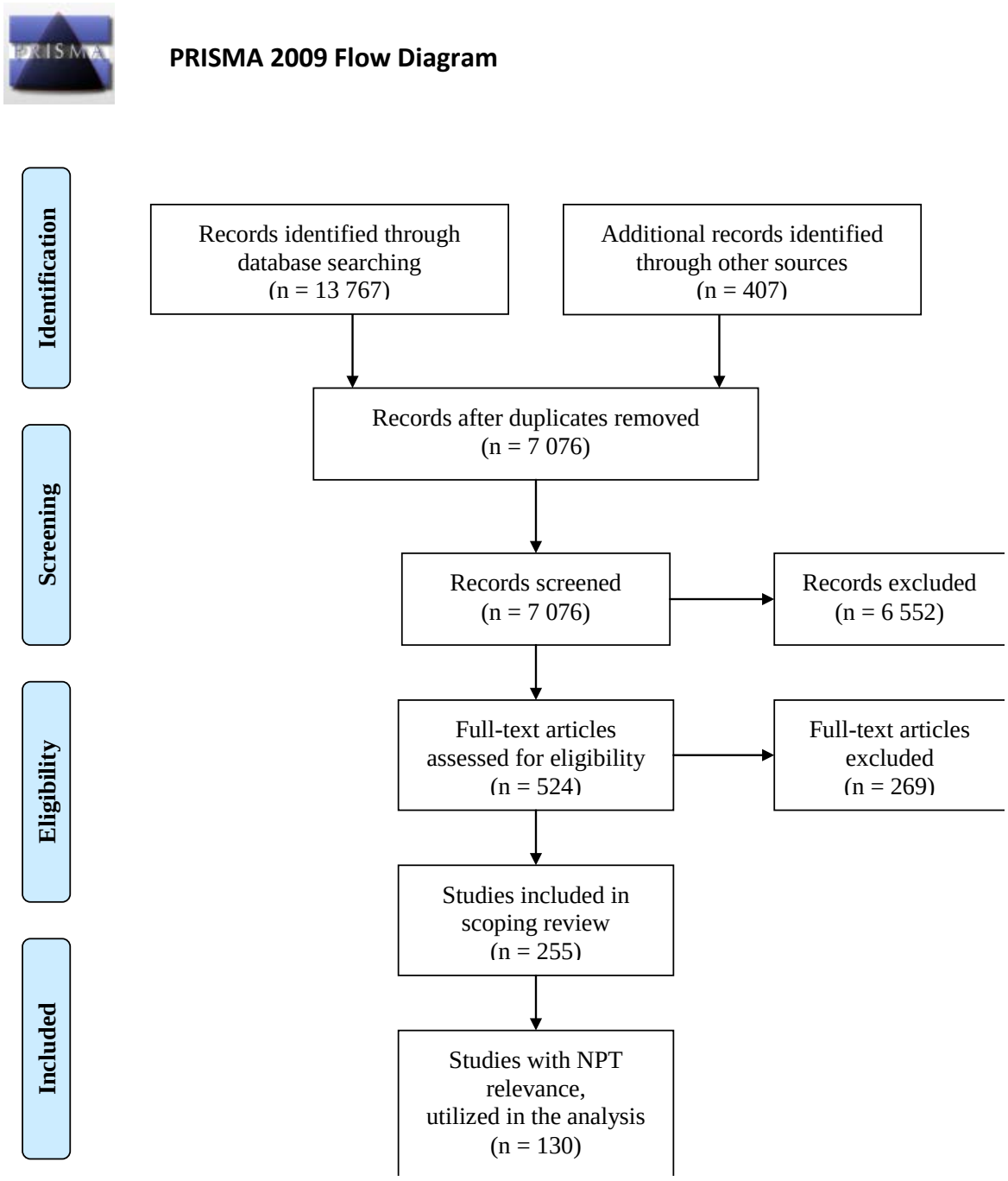
Results

The following section will provide a summary of the findings of the scoping review and content analysis. A brief overview of the findings will be presented first, followed by the results from the statistical analysis. Finally, there will be a summary of the outcomes from the qualitative analysis split into four segments for each of the NPT categories. In cases where themes from the qualitative analysis occur over several thematic levels (i.e. a theme contains various sub-themes) a figure will be presented to illustrate the relation among themes.

The initial database search resulted in 13 767 citations, in addition to 407 citations that were retrieved from other sources, such as reference lists, journal searches and requests to relevant societies (see Figure 1 for a flowchart of the screening process). After duplicates had been removed, the total number of citations was 7 067. The first stage of the screening process identified 524 of these as papers on internet interventions for depression. The second stage of screening involved retrieving these in full-text and evaluating them for eligibility. Two-hundred and sixty-nine articles were excluded for various reasons. The majority of the papers that were excluded were non-empirical (e.g. letter to the editor, study protocol, posters or congress abstracts etc.), others were duplicates that had not yet been identified, and some were not in English or any Scandinavian languages.

Figure 1

Flowchart of the Screening Process



The final number of empirical papers that met the inclusion criteria for internet interventions for depression was 255. The selection included qualitative and quantitative studies, interviews, pre- and post-tests, randomized controlled trials, meta-analyses and reviews, to mention some. Interventions were based on different therapeutic approaches such as CBT, mindfulness and psychoanalysis. All articles were coded for relevance to the NPT constructs. 51 % (130/255) of these contained information relevant to the NPT, which were used as the basis for further analysis. None of the articles made reference to the NPT, though four utilized other implementation theories: two on the Diffusion of Innovations Theory (Carper, McHugh, & Barlow, 2013; Lovejoy, Demireva, Grayson, & McNamara, 2009) and two on the RE-AIM framework (Eisen et al., 2013; Van Voorhees et al., 2010). Content analysis of the 130 articles revealed 1011 meaning units about implementation that could be interpreted using the NPT as an explanatory model. Appendix G contains an overview of all NPT sub-categories with the amount of units onto each of them. In addition to the NPT, all units were also coded on the organizational level, providing 928 units on users, 73 units on practitioners and 10 on residual levels. The following section will describe the findings from the quantitative analyses, including contingency tables and chi-square tests.

Statistical Findings

Analyses were performed on the papers that were found to carry relevance to the NPT. First, a contingency table was produced to show the number of relevant articles coded onto the four core NPT categories (see Table A). The number of relevant articles coded onto the NPT ranged from 25 for Coherence to 88 for Reflexive Monitoring, whereas the number of articles with no relevance to the NPT ranged from 167 for Reflexive Monitoring to 230 for Coherence. Hence, observed frequencies of non-relevant articles outnumbered the amount of relevant articles for all the categories of the NPT.

Table A

Articles Reporting Relevant Information to the Four Core Categories of NPT

	Coherence	**Cognitive**	**Collective**	**Reflexive**
Yes	25 (10 %)	60 (24 %)	67 (26 %)	88 (35 %)
No	230 (90 %)	195 (76 %)	188 (74 %)	167 (65 %)

Two chi-square tests were carried out to study whether there were any systematic differences in the reporting of internet interventions as coded onto the NPT. The first test was performed to assess whether there was a systematic relationship between the reporting of NPT-relevant information across NPT categories, using a chi-square test for independence. Table B displays the findings from this analysis, whereas Appendix E shows the contingency tables of observed frequencies. The chi-square comparisons indicated that there was a systematic relationship between the reporting of information relevant to all NPT categories, ranging from $\chi^2 = 10.941$ to $\chi^2 = 38.508$, all with a significantly low p-value ($p < .001$). Examination of the contingency tables indicated that the reporting of information relevant to one NPT category rarely co-occurred with the reporting of information relevant to another NPT category (<44). On the other hand, the most frequent values in the contingency table concerned the articles that did not carry relevance to either of the two compared NPT categories (<183). Consequently, the significant association between the NPT categories was due to a systematic absence of reporting.

Table B

Chi-Square Comparison Between Categories

	Categories	χ^2	df	p	phi	sig.
Contrast 1	Coherence Cognitive Participation	10.941	1	.001	.224	.000
Contrast 2	Coherence Collective Action	37.585	1	.000	.401	.000
Contrast 3	Coherence Reflexive Monitoring	12.542	1	.000	.237	.000
Contrast 4	Cognitive Participation Collective Action	18.616	1	.000	.282	.000
Contrast 5	Cognitive Participation Reflexive Monitoring	12.715	1	.000	.235	.000
Contrast 6	Collective Action Reflexive Monitoring	38.508	1	.000	.400	.000

Note: A dichotomous variable was used, in which 0 = No and 1 = Yes.

The second test was carried out to examine whether the reporting on information relevant to the 16 NPT sub-categories were systematically distributed. Appendix F provides an overview of the articles that contained relevant information to the 16 sub-categories. The distribution of frequencies indicated that reporting of NPT-relevant information was not evenly dispersed among the sub-categories. Reporting ranged from zero papers on some sub-categories, such as initiation and communal specification, to 80 papers on individual appraisal. A chi-square goodness-of-fit test indicated that these differences in reporting were significant for Coherence χ^2 (2, N = 30) = 15.00, $p < .001$; Cognitive Participation χ^2 (2, N = 67) = 49.194, $p < .001$; Collective Action χ^2 (3, N = 93) = 46.570, $p < .001$; and Reflexive Monitoring χ^2 (2, N = 145) = 60.179, $p < .001$. These results suggest that information on the implementation of internet interventions for depression, as coded onto the respective NPT sub-categories, was not equally distributed and that reporting of relevant information was clustered on certain sub-categories. In other words, there was a systematic distribution in the sense that certain sub-categories were reported significantly more than others.

Overall, these findings indicate that research on internet interventions for depression does not frequently emphasize relevant aspects of implementation, as analyzed with the NPT. The results also suggest that the reporting of information relevant to one NPT category rarely co-occurs with the reporting of information relevant to another NPT category. Moreover, the distribution of reporting is not evenly spread out, but is rather clustered on some NPT sub-categories, such as individual appraisal, systematization, activation and contextual integration.

The following section will outline the findings from the qualitative content analysis. The text will be split up according to the taxonomy of the NPT framework (see Appendix D for an overview of the NPT taxonomy). The initial paragraph will contain the overall findings on the first core category, providing the frequency of units and articles coded onto that category, as well as the distribution of coding on different organizational levels. The succeeding paragraphs will contain the four sub-categories affiliated with each core category, outlining the identified themes. Given that the majority of units were on the user level for all categories, only user themes will be reported. The only exception is in the few cases where units on other levels, such as practitioners, were comparably frequent in relation to the number of user units. In such cases, the reporting on practitioner themes will be explicitly stated.

Qualitative Findings

1. Coherence. Coherence refers to the process of sense-making and understanding that occurs when a new intervention is implemented (e.g. whether users understand how the intervention will affect them personally, if practitioners comprehend the benefits of the intervention etc.). Out of the 130 references that were coded onto and contained information relevant to the NPT, 25 references had information coded onto Coherence, comprising of a total of 72 identified meaning units. Coherence thus accounted for 7 % of the meaning units (72/1011), with 75 % of these units on the user level (54/72) and 25 % on the practitioner level (18/72). The four succeeding paragraphs contain the findings on implementation that relate to the four sub-categories of Coherence.

Differentiation. Differentiation refers to individuals' understanding of how an intervention is different to other practices (e.g. how a depression website is different from face-to-face therapy). 15 % of statements on Coherence were coded onto differentiation (11/72). Differentiation statements were divided into two themes: *confusion* and *comparisons with face-to-face treatment.* Confusion referred to users' misconceptions, such as believing that screening for study eligibility or research questionnaires were a part of treatment. Formulations about face-to-face treatment mainly concerned users' perceptions of advantages or disadvantages compared to the internet intervention in which they were involved. One author noted how an internet intervention might be viewed as less beneficial:

> For a number of participants who had previously participated in a mindfulness group, the Web-based approach lacked some advantages of the in-person format. Chief among these were the absence of an instructor and the opportunity to learn together as a group (Boggs et al., 2014, "Participant Feedback on Web-Based MBCT Group Process", para. 2).

Individual specification. Individual specification refers to how people comprehend their tasks and responsibilities and what the intervention requires of them (e.g. practitioners understand the amount of work involved in implementing the intervention). 14 % of the Coherence units were coded on individual specification (10/72). All statements were labeled under the theme *needs.* Needs referred to wanting to try the intervention before use and need for support. This theme reflected the individuals' understanding of what was required from them and what they needed in order to face the requirements involved in participating in the intervention.

Communal specification. Communal specification refers to how a group builds a shared understanding about the purpose and outcome of the intervention (e.g. all practitioners agree on the aim of the intervention). No meaning units were coded on communal specification.

Internalization. Internalization refers to how individuals understand the value, benefits and importance of an intervention (e.g. users feel the intervention promotes their well-being). This was the sub-category under Coherence with the most meaning units, comprising of a total of 68 % (49/72). The identified themes were *benefits* and *doubts*, with units coded on both the user (36/49) and practitioner level (13/49). Benefits pertained to ideas such as viewing depression treatment as important, expecting the intervention to be effective and believing that the program could teach useful skills. Some users "enjoyed how the program was not a mere channel for information that provides general advice, but it 'raised' questions that stimulated to self-reflection and it provided helpful exercises in an interactive manner" (Haga, Drozd, Brendryen, & Slinning, 2013, p. 9). Practitioner benefits generally concerned how aspects of the intervention would improve the existing relationship between therapist and client, as well as intervention features that that seemed useful in helping users improve. As for doubts, users either viewed the intervention as scary or had general negative impressions about the program. Practitioner doubts concerned impressions that the intervention might be time-consuming and that it might not be in line with cultural values.

Residual. There were only two meaning units within Coherence that did not fit any of the sub-categories. These had no common meaning and were therefore not labeled with a theme.

2. Cognitive participation. Cognitive Participation refers to the processes associated with getting individuals to "buy into" and engage with the intervention (e.g. whether practitioners are willing to contribute in implementing the intervention, if users are willing to keep using the intervention etc.). Out of the 130 NPT-relevant articles, 60 contained information relevant to Cognitive Participation, with 156 meaning units in total. Compared to the total amount of meaning units, Cognitive Participation accounted for 16,5 % (156/1011). 97,5 % of these units were on the user level (152/156), whereas 2,5 % were on the practitioner level (4/156). The four succeeding paragraphs contain the findings on implementation that relate to the four sub-categories of Cognitive Participation.

Legitimation. Legitimation refers to individuals' beliefs that it is right for them to be involved in the intervention, as well as their beliefs in being able to make a valid contribution

to the implementation process (e.g. users' justifications for why they intend to participate, or practitioners feeling able to provide useful insights that might aid the implementation work). 14 % of the Cognitive Participation units were coded on legitimation (22/156). Statements were divided into two themes: *future use intentions* (whether one intended to participate in the intervention) and *reasons for involvement* (justification for one's intention to participate). Future use intentions were reported in quite similar ways across studies. Authors tended to measure intentions quantitatively, with questionnaires evaluating the degree to which users would like to take part in the program. Justification for involvement was reported and assessed in a more varied fashion, with reasons like "desire to prevent recurrence", "flexibility of use" and "privacy and anonymity". These were the outcomes of both questionnaires and qualitative interviews.

Enrolment. Enrolment refers to the ways individuals organize themselves in order to contribute collectively to the implementation (e.g. all practitioners were willing to restructure their workday in order to take part in the implementation work). The reporting on enrolment was limited to 4,5 % of the units on Cognitive Participation (7/156). As there was no shared meaning among the units, there were no recurring themes that could be identified.

Initiation. Initiation refers to whether key individuals are willing to drive an intervention forward (e.g. a small group of practitioners are charged with the task of recruiting more users to join the intervention). No articles in the data set made any reference to key individuals, hence there were no units coded onto initiation.

Activation. Activation refers to what is needed in order to sustain involvement in an intervention (e.g. support from a practitioner helps users maintain their involvement in treatment). Activation was one of the more common subjects in the literature, occurring in a total of 49 articles. 79,4 % of the Cognitive Participation units were on activation (124/156). These were all clustered under the major theme of *fidelity*, denoting various aspects of compliance to the intervention. Fidelity was split up into two sub-themes, namely *completion* and *adherence.* See Figure 2 for an overview of how the themes were distributed.

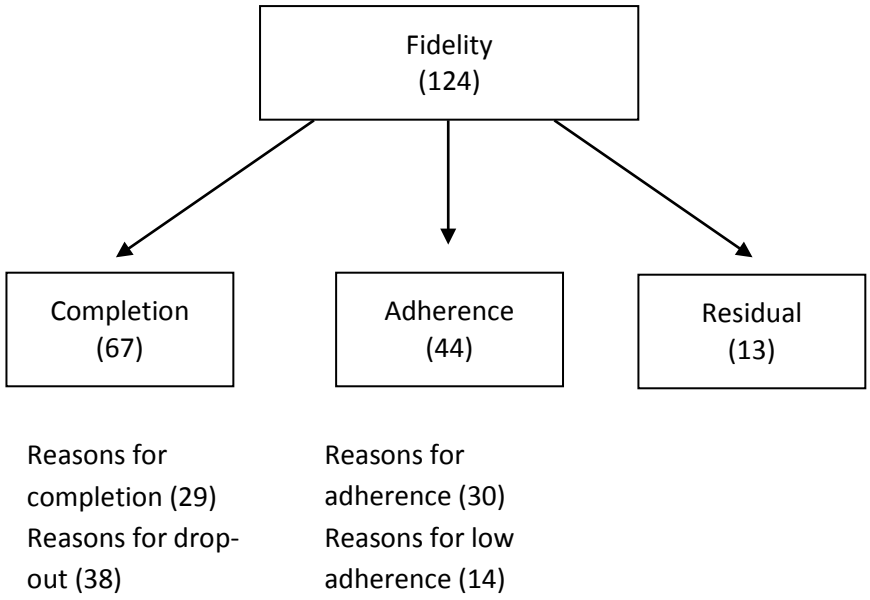
Both themes contained negative and positive statements, meaning that the theme completion covered both units on "completion" as well as "dropout" and "attrition". The distinction between completion and adherence is in line with Christensen, Griffiths and Farrer's (2009) distinction between dropout and adherence:

> the term adherence refers to the extent to which individuals experience the content of the Internet intervention. The term dropout is used to describe an individual who fails to complete the research trial protocol associated with an Internet intervention, and thus does not complete trial assessments (p. 3)

These themes may seem similar, but are conceptually distinct. Whereas completion refers to making it through the course, adherence refers to following the treatment regimen as prescribed. A person may be compliant to the planned course of therapy, but fail to complete the intervention.

Figure 2

Diagram of the Themes Under Activation



Note: The numbers in parentheses refer to the frequency of units for each given theme.

Completion contained 29 units on the sub-theme “reasons for completion”. Most of these units were from papers focused on studying associations between the number of completers and various user-related variables. These found significant positive effects for factors such as marital status (van Straten, Cuijpers, & Smits, 2008), level of engagement with the program (Meyer et al., 2009) and older age (e.g. Morgan, Jorm, & Mackinnon, 2013; Pittaway et al., 2009; Shapira & Mongrain, 2010; Williams & Andrews, 2013). In addition, qualitative interviews revealed reasons such as the intervention serving as a break from a hectic day and a desire to “do the right thing” (Haga et al., 2013).

Completion contained 38 units on the sub-theme "reasons for dropout". Compared to the reasons for completion, these were rarely analyzed statistically. Mostly, authors described reasons for dropout quite briefly. The most common reasons for why users failed to complete the interventions were lack of time, personal issues, technical issues, improvement in symptoms, not being motivated and lack of interest. One author described the reasons for why users dropped out as follows:

> The reasons most mentioned for dropping out were 'time of the course no longer convenient,' 'had obtained other help,' 'no longer had depressive symptoms,' 'had computer problems,' 'did not feel motivated by the materials provided,' or 'found the course too difficult' (Gerrits, van der Zanden, Visscher, & Conijn, 2007, p. 6).

Adherence was divided into a positive sub-theme "reasons for adherence", which contained 30 meaning units, and a negative sub-theme "reasons for low adherence", which contained 14 meaning units. Much like with reasons for completion, the reasons for adherence were often analyzed in order to determine whether they were significant predictors. Reasons that predicted adherence ranged from being in a school-based setting (Neil, Batterham, Christensen, Bennett, & Griffiths, 2009), lower baseline depression (Paul et al., 2013) and number of exercises (Schueller & Parks, 2012). However, there were no recurring predictors across studies. Other reasons that were not assessed as predictors included support and identification with the treatment material. As an example of improved adherence due to identification, consider the following testimony from a participant:

> And then I started to link the examples in the films to myself, and think about how I could make things better. It kept me occupied the whole week and then I noticed that I felt a bit better and that motivated me to follow the next lesson (Gerhards et al., 2011, p. 120).

Reasons for poor adherence were also split into reasons assessed as predictors and reasons that were not statistically evaluated. Among the predictors, only perceived support (Marko, Fogel, Mykerezi, & Van Voorhees, 2010; O'Mahen et al., 2013) occurred in more than one paper. Feeling stressed from high expectations, experiencing improvement and not currently being depressed were among the reasons for low adherence that were not evaluated statistically.

Residual. Three percent of the units on Cognitive Participation did not fit into any of the existing sub-categories (4/156). There were no common meanings among them, and so none were labeled with themes.

3. Collective action. Collective Action refers to the processes associated with the work individuals and organizations do to enact an intervention (e.g. whether users find the intervention manageable to use, if practitioners have the necessary skills to implement the intervention etc.). Compared to Coherence and Cognitive Participation, this concept was somewhat more prevalent in the literature. A total of 67 articles contained information relevant to Collective Action, with 388 meaning units. Collective Action comprised 38 % of all the units (388/1011), of which 90 % were on the user level (349/388) and 10 % on the practitioner level (39/388). The four succeeding paragraphs contain the findings on implementation that relate to the four sub-categories of Collective Action.

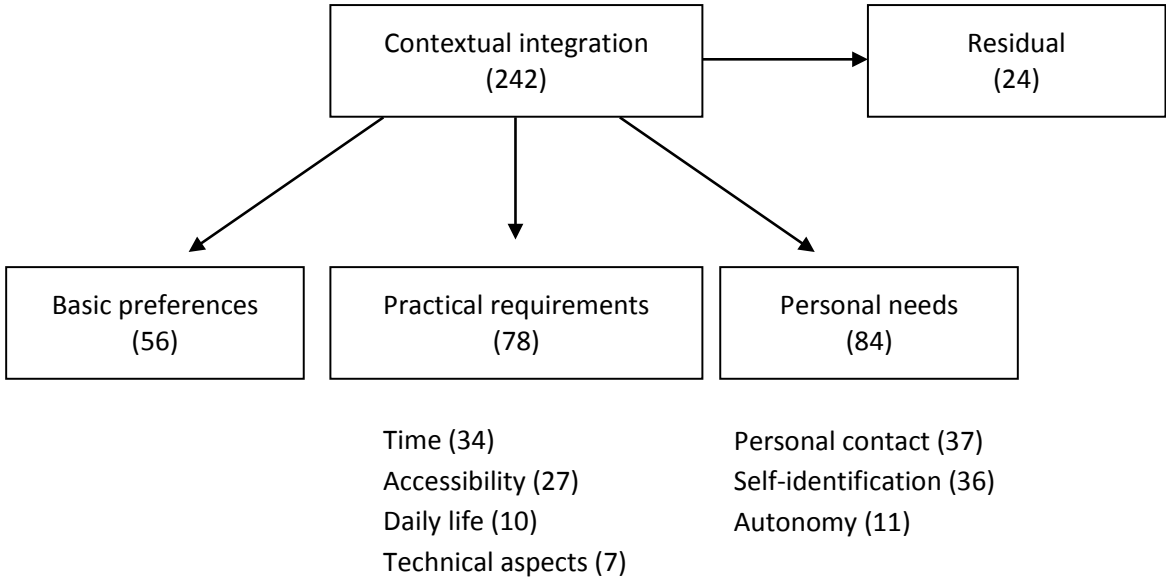
Skill set workability. Skill set workability refers to whether the intervention fits with individuals' skills and perceived job role (e.g. users have all the skills needed in order to access the intervention material). Out of all the Collective Action units, 23 % were coded onto skill set workability (88/388), providing the themes *skills* and *manageability*. Skills refer to the abilities (or lack thereof) that had impact on the implementation of the intervention in some way. Computer skills were the ones most frequently reported, either because participants had the sufficient level of competency, or because they were not able to perform the tasks required and needed training or support in order to do so. Crabb et al. (2012) describe lack of computer skills in this way: "Three authors commented that they had observed older adults having technical challenges in accessing or engaging with CCBT programs [author's note: computerized CBT]" (p. 462). Manageability is related to skills, but rather than focusing on specific abilities, it pertains to whether users were able to handle the intervention with their complete set of relevant skills. In general, the intervention was perceived as either too difficult to comprehend or maneuver, or easy to understand and operate. Authors of one study described how users "reported that the treatment could be complicated and impersonal and involved a lot of work" (Richards & Timulak, 2013, p. 198).

Contextual integration. Contextual integration refers to the overall compatibility or "fit" with the intervention (e.g. users feel the intervention is suitable to their particular circumstances, practitioners find it convenient for them to participate etc.). Contextual integration was one of the most frequently reported sub-categories of the NPT, occurring in a total of 48 articles. 62,5 % of the Collective Action units were coded on contextual integration (242/388). Three major themes were identified: *basic preferences, practical requirements* and *personal needs.* See Figure 3 for an overview of how these themes were distributed.

Basic preferences involved how the intervention suited individuals' taste in relation to the content of the intervention (e.g. layout, navigation, structure etc.). These mainly concerned superficial aspects of the material, such as the colors of the website, the organization of module sections, the preference for emoticons and impressions about the use of videos. This kind of information was most often collected from users in order to improve the usability of the intervention. Currie, McGrath and Day (2010) received feedback on the interface of their intervention platform: "A couple of participants liked the expanding side tab menu of the program, however, a few participants were unsure of how to use, or did not notice the feature at all" (p. 1423). Later on, the authors used this feedback in order to improve the intervention interface.

Figure 3

Diagram of the Themes Under Contextual Integration



Note: The numbers in parentheses refer to the frequency of units for each given theme.

A great number of articles discussed the compatibility between the intervention and the users' practical requirements. These requirements were divided into three sub-themes: *time, accessibility* and *daily life.* Time denoted whether the amount of time required by the intervention was agreeable with the users' needs. For some, the interventions were perceived positively since they allowed for a more flexible scheduling than would be possible with face-to-face treatment. Whereas others had difficulty finding time to devote themselves to participating and thus felt that the intervention was not compatible with their requirements. Accessibility denoted whether the users experienced the intervention as available. Users'

experiences within this domain was almost uniformly positive. Many participants pointed out the lack of travel time associated with an internet platform, whereas others were pleased with the affordability of the intervention. As one user pointed out: “this is wonderful, because you can do it at home and you don’t have to go somewhere and talk to somebody” (Danaher et al., 2012, p. 6). Daily life referred to the intervention’s overall fit with the users’ day-to-day routine. This theme was reported somewhat less than the other two, with just a few articles focusing on the effect of the intervention on participants’ everyday lives. Most formulations within this theme were rather general, such as: “The treatment was said to facilitate the generalization of treatment to the patients’ everyday lives” (Mansson, Skagius Ruiz, Gervind, Dahlin, & Andersson, 2013, "Patients' User Experiences", para. 2).

The compatibility between the intervention and people’s personal needs was covered by several meaning units. These personal needs were divided into three sub-themes: *self-identification, personal contact* and *autonomy.* Self-identification concerned whether the intervention material was experienced as applicable to one’s own personal situation. One user expressed it in this way:

> From my perspective, the best part of the program was simply the fact that I felt so much applied directly to me and my situation. To sum it up, I felt that the program ‘seemed to be written specifically for me.’ A very large part of the program ‘fit me very well.’ (Pugh, Hadjistavropoulos, Klein, & Austin, 2014, p. 73)

The majority of units were on the positive end of the spectrum. However, some units referred to how individuals experienced the content as impersonal and superficial. Personal contact denoted whether the intervention fit with one’s need to have some form of interpersonal contact or whether one would like to be undisturbed and free from intrusion. The majority of reporting was on how users experienced that the intervention maintained their privacy, with mainly positive statements overall. Many were concerned with a need for anonymity, and appreciated how online treatment was suited to protect that need. Others would rather have preferred more personal contact than the intervention offered: “I need to be with people, I can't just be alone behind my computer screen” (Gerhards et al., 2011, p. 122). Finally, the sub-theme autonomy referred to whether people’s needs for self-control was fulfilled, as well as their needs to personalize and alter the intervention. Most units within this theme pertained to whether one experienced the programs as either flexible (e.g. the possibility to chose parts of the program that was suitable for them) or inflexible (e.g. impossible to go back and repeat previous sessions).

Interactional workability. Interactional workability refers to the impact of the intervention on the work done in a consultation (e.g. the program improves communication in the client-therapist relationship). Fourteen percent of the Collective Action units were on interactional workability (53/388), which were sorted into the themes *expectations* and *outcomes* for both users (34/53) and practitioners (19/53). User expectations were mainly negative and referred to concerns about not being able to develop a trusting relationship online, though some were attracted to the anonymity of the program and expected this to enable them to commit more. Negative user outcomes in relation to interactional workability were mainly experiences of poor relationships with therapists. In one study by Bendelin et al. (2011) the users "reported feeling stressed by too high expectations and demands from the therapist behind the program" (p.6-7). Positive user outcomes were reported more often than any other units on interactional workability. Some of these referred to how users experienced that the therapists were able to help them more rapidly and how they themselves became more open and honest. Notably, a large part of the positive outcomes were on alliance scores, which tended to be very good: "Results indicated that the overall working alliance scores […] were significantly higher in e-therapy than in face-to-face interventions, with medium to large effect sizes" (Sucala et al., 2012).

Practitioner expectations were rarely reported (5/53), with all being in the negative domain. A few therapists had concerns that the intervention would prove detrimental to their relationship with clients. Practitioner outcomes were also quite rare (13/53). These were mainly positive, with practitioners reporting good experiences with therapy online. The impact of the using the internet was positively received in a paper by Robertson, Smith, Castle and Tannenbaum (2006): "All surveyed clinicians reported that they were satisfied with the system; 83% reported that it helped their relationship with their patients, and 100% reported that it helped their patients to better manage their condition" (p. 416).

Relational integration. Relational integration refers to how the intervention fits with existing relationships among groups, as well as the degree to which it promotes trust, accountability and responsibility in these relationships (e.g. the intervention contributes to improved trust between nurses and doctors). Five units were coded onto relational integration (1,5 % of the Collective Action units; 5/388), which had no shared meanings. Hence, no themes were extracted for relational integration.

4. Reflexive monitoring. Reflexive Monitoring refers to the ways an intervention is evaluated once it is in use, as well as the outcomes of this evaluation (e.g. how developers of

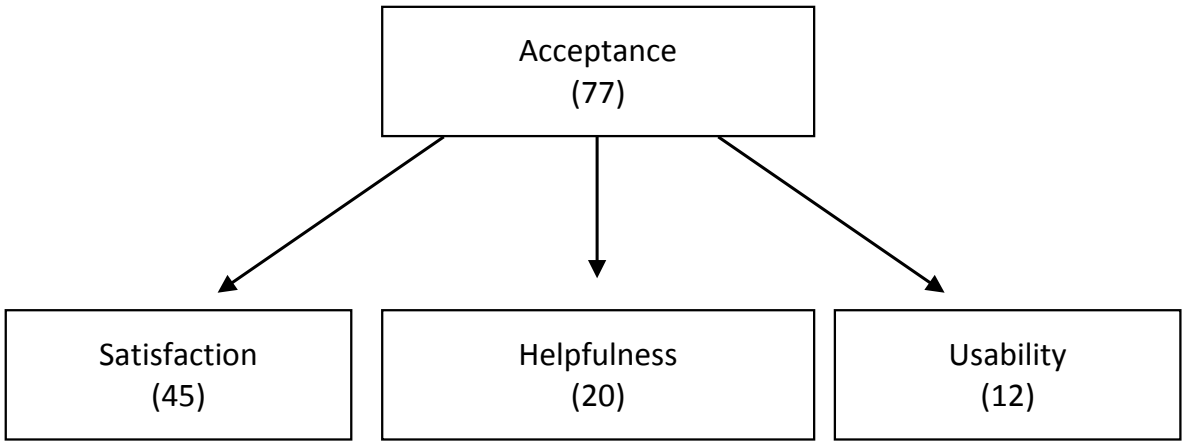
the intervention measure the usefulness of the intervention, whether users view the intervention as worthwhile, if practitioners attempt to alter the intervention etc.) This concept occurred most frequently in the literature compared to the other NPT constructs. In total, 88 articles contained information relevant to Reflexive Monitoring, with 395 meaning units. Compared to the total amount of units, Reflexive Monitoring accounted for 39 % (395/1011). The bulk of these units were on the user level with 94,5 % (373/395), whereas 3 % were on the practitioner level (12/395) and 2,5 % on residual levels (10/395). The four succeeding paragraphs contain the findings on implementation that relate to the four sub-categories of Reflexive Monitoring.

Systematization. Systematization refers to the ascertainment of how effective and useful an intervention is, involving the various ways information may be collected (e.g. practitioners use formal evaluation methods to evaluate how useful the intervention is). Systematization occurred quite frequently in the literature, with a total of 59 relevant articles. Of all the Reflexive Monitoring units, 24,5 % were coded onto systematization (97/395). People's evaluation of interventions tended to be measured by means of post-intervention questionnaires with Likert scales. Open-ended questions and interviews were rarely used to assess the evaluation of an intervention. The most frequently used questionnaire types are reported in Appendix H.

The type of information measured was sorted into themes, with a*cceptance* being a major recurring theme. Additionally, three sub-themes were identified: *satisfaction, helpfulness* and *usability*. See Figure 4 to see how these themes were distributed. It should be noted that for most themes, terms were often operationalized quite differently across studies, which entailed that some concepts had a tendency to overlap (e.g. "satisfaction" could be a composite measure of "helpfulness" and "usefulness"). Consequently, the themes presented here are not always mutually exclusive, but somewhat overlapping.

Figure 4

Diagram of the Themes Under Systematization



Note: The numbers in parentheses refer to the frequency of units for each given theme.

The most frequently reported measure of acceptance was satisfaction, generally referring to whether users' overall attitude towards the intervention was positive or negative. More general terms such as "like" or "dislike" were also used quite often when satisfaction was assessed. There were few types of measurement reported across studies, the exception being the 8-item version of the Client Satisfaction Questionnaire (CSQ-8), which was reported in six different articles, and the Credibility/Expectancy Questionnaire, which was mentioned in four articles.

A few studies measured participants' ratings of helpfulness, meaning how useful or practical users experienced the intervention to be. There were no recurring measures of helpfulness, apart from those overlapping with satisfaction questionnaires. The Helpful Aspects of Therapy form was the only validated questionnaire used on helpfulness (Richards & Timulak, 2012).

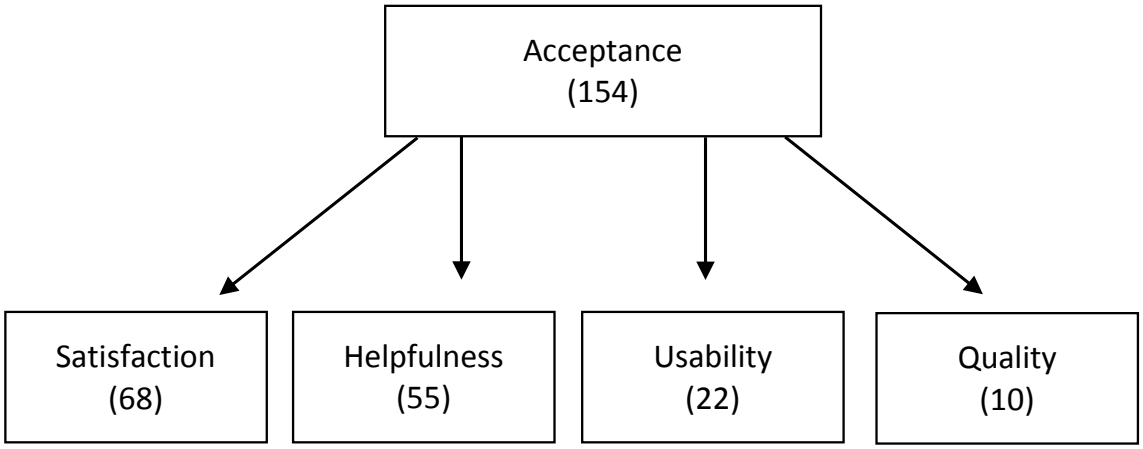
Usability was measured in a few studies, mainly in terms of how the participants described the difficulty of the intervention (e.g. "ease of use", "positive and negative experiences of use", "usability of content" etc.). Among these, there was one recurring questionnaire, the System Usability Scale (SUS), which was used in three papers. Apart from this, there were no measures of usability that occurred frequently across studies.

Individual appraisal. Individual appraisal refers to individuals' evaluation of an intervention and its effects on them and their context (e.g. users assess the intervention as worthwhile). As opposed to systematization, individual appraisal concerns the outcome of evaluation methods. Individual appraisal was the most frequently reported sub-category of the NPT, appearing in 80 articles. Out of all the units on Reflexive Monitoring, 60 % were coded

onto individual appraisal (236/395). The themes on individual appraisal were *satisfaction, helpfulness, usability* and *quality.* See Figure 5 to see how these themes were distributed.

Figure 5

Diagram of the Themes Under Individual Appraisal



Note: The numbers in parentheses refer to the frequency of units for each given theme.

As in systematization, satisfaction was the most commonly reported theme. The units mainly concerned overall ratings of the interventions on Likert-type scales. Dear et al. (2011) described their users' ratings in this way:

> Participants who completed the post-treatment satisfaction questionnaires reported a high level of satisfaction with the overall program with 25/28 (89%) being either very satisfied or mostly satisfied and 3/28 (10%) neutral/somewhat satisfied and no participants rating the program as unsatisfactory (p. 835).

There were also a few ratings of treatment quality. These were closely related to the satisfaction ratings, in the sense that they referred to individuals' perceptions of how the intervention conformed to their personal standards, but tended to focus more on specific aspects of the intervention (e.g. quality of treatment modules etc.)

Helpfulness was also reported quite frequently, and did mainly contain quantitative ratings. Units differed from satisfaction in the sense that they were less concerned with the intervention in its entirety, and more focused on specific aspects of the intervention. Some papers reported on the helpfulness of the program in dealing with problems, learning and benefitting from treatment and acquiring new skills. For instance, one article mentioned how "ratings of helpfulness of the domains of understanding and behavior change were in the moderately favorable range" (Iloabachie et al., 2011, p. 550).

Usability was reported less frequently than satisfaction and helpfulness. The units that contained information about ease of use or how logical the treatment was experienced, all reported quantitative ratings, and generally tended to focus on the overall program, rather than specific aspects of treatment.

Communal appraisal. Communal appraisal concerns the way a group evaluates the intervention (e.g. a group of nurses collectively judge the new program as being worthwhile). No meaning units were coded on communal appraisal.

Reconfiguration. Reconfiguration refers to individuals' attempts to redefine or modify the intervention (e.g. users try to adapt components of the intervention to suit their needs). Ten percent of the Reflexive Monitoring units were on reconfiguration (38/395). These statements were labeled with the themes *preferred changes* and *tailoring.* Some authors reported participants' suggestions for improvements or preferred changes to the intervention. Most suggestions were related to the users' need for more interpersonal contact. As expressed by one user in Boggs et al. (2014)"I think this would be a lot better if there was a Web-based group…I felt alone out here. I would have been engaged more" ("Participant Feedback on Web-Based MBCT Group Process", para. 4). A few units pertained to actual changes, or tailoring, made by participants. Some users found that the intervention program did not suit them in the way it was presented and responded by modifying it to their own needs:

> Due to negative experiences with some components (e.g. homework or mood diary), completers did not necessarily use all the components of each course session. These completers tailored the CCBT program to their own situation by selecting only those components experienced as beneficial (Gerhards et al., 2011, p. 121).

In cases where developers responded to suggestions from users in order to alter the intervention, units were coded on a residual organizational level, as "developers" were not a part of the organizational level coding framework (see Appendix C). These units concerned different actions that were carried out to improve different aspects of the intervention: "The re-design of the website therefore aimed to increase socio-cultural relevance, improve the efficacy of the depression prevention exercises, and include more motivational structure" (Landback et al., 2009, p. 350-351).

Residual. There were 27 units on Reflexive Monitoring that did not fit into its associated sub-categories (6 % of the units on Reflexive Monitoring; 24/395). These were all statements regarding whether users would *recommend the program to others*. The general

trend was either to ask “Would you recommend the intervention to a friend/a friend with depression?” or “Would you recommend the intervention to others?”

Discussion

The primary aim of this paper was to explore what is known about implementation in the literature on internet interventions for depression, using the Normalization Process Theory as a theoretical framework. The review process identified 255 empirical papers on internet interventions for depression. 130 of these contained information relevant to the NPT, meaning that 125 (49 %) of the articles on online interventions for depression did not report any implementation information relevant to the NPT. It should also be pointed out that, even though the NPT has been used extensively in relation to other e-health initiatives (McEvoy et al., 2014), none of the papers identified in this review made reference to the theory. Moreover, only a small number of papers made direct reference to other implementation theories.

Principal Findings

The first research question concerned whether there are any systematic differences in the reporting of implementation of internet interventions for depression, as coded onto the NPT. An examination of the contingency table of all papers coded onto the NPT (Table A) indicated that information about the implementation of internet interventions for depression was most commonly not reported. The first statistical test revealed that there were systematic relationships between reporting information relevant for implementation. However, these associations referred to the absence of reporting NPT-relevant material, indicating that authors tend to not emphasize implementation information. More specifically, papers that contained information about implementation on one NPT category often did not contain information about another NPT category. These findings show that there is a lack of systematic reporting on the implementation of internet interventions for depression (note: *systematic* in the sense of ordered, not in the sense of *systematic distribution* as mentioned above). One would expect that a systematic approach to the reporting would lead authors who report on one aspect of implementation to report on other aspects of implementation. However, these results demonstrate that this was not the case for studies published up until March, 2014. Furthermore, the second statistical analysis showed that there was a systematic distribution of relevant material within each of the NPT categories, with certain sub-categories (such as individual appraisal and systematization) being significantly more

reported on than others. In other words, the literature on implementation-relevant information was not evenly distributed, but rather clustered among some of the NPT-sub categories. This suggests that researchers tend not to report on all or most aspects of implementation, but rather emphasize a limited selection of certain aspects.

The second research question concerned the content of knowledge relating to the core NPT categories for internet interventions for depression and how this knowledge was characterized. The majority of content was concentrated on the implementation effort (Contextual Integration) and the intervention evaluation (Reflexive Monitoring). Additionally, all information was coded on the individual level (users and practitioners), with no content being coded on higher levels such as groups, organizations or larger systems. The more specific distribution of content within the 16 NPT sub-categories is outlined below, as well how this content was characterized in the sense of themes.

Coherence. Sense-making and understanding of a new intervention, was rarely emphasized in the literature. Most information was focused on understanding of benefits and doubts of an intervention (under the sub-category internalization). Users and practitioners tended to expect the intervention to be useful and effective, despite some doubts being present. These impressions were more prevalent than the understanding of differentiation between practices (differentiation) and the individual perceptions of tasks and responsibilities (individual specification). Communal specification was not covered whatsoever, suggesting that there is little or no focus on how individuals work together to build a shared understanding of the purpose of a program.

Cognitive Participation. Engagement and willingness to participate was rarely a topic in the reviewed papers. Two of the sub-categories were hardly covered at all (enrolment and initiation), and information on whether individuals were willing to "buy into" the intervention (legitimation) was only reported in a handful of statements. Information concerning sustained involvement in an intervention (activation) was the only concept to obtain a substantial amount of focus. All statements within this concept were devoted to data on fidelity, suggesting that there is a marked interest in concepts such as completion and adherence. Interestingly, a selection of articles were primarily devoted to study predictors and ways to improve adherence (Christensen et al., 2009; Farrer, Griffiths, Christensen, Mackinnon, & Batterham, 2013; Gerhards et al., 2011; Lillevoll, Vangberg, Griffiths, Waterloo, & Eisemann, 2014; Marko et al., 2010; Neil et al., 2009; Titov et al., 2014), which substantiates the claim that there is a noticeable interest in fidelity in the field of internet interventions for

depression. Furthermore, these articles were all published after 2009, which might indicate a recent upswing in the emphasis on fidelity-related information.

Collective Action. A great deal of information was provided on efforts that are performed in order to enact an intervention. The major share of this data was on the overall compatibility or "fit" with the new intervention (contextual integration). Users were concerned with how the program fit their everyday requirements in regard to such practical matters as accessibility and sufficient time. Moreover, there was an emphasis on how personal needs were met, such as personal contact, privacy and autonomy. Other Collective Action categories were covered, though in a lesser degree than contextual integration. There was some reporting on the intervention's fit with existing skills (skill set workability), which mainly emphasized how the intervention suited existing abilities, as well as whether the program was perceived as manageable. As for the work done in a consultation (interactional workability), most statements concerned either expectations or experiences about how the intervention affected the client-therapist relationship. Information relating to existing relationships among groups (relational integration) was hardly reported.

Reflexive Monitoring. Information on intervention evaluation was the most prevalent among the articles on internet interventions for depression. Within this category, individual appraisal was by far the most reported subject in the literature. Evaluation was primarily centered on users' acceptance of program aspects like usability, helpfulness and quality. These appraisals were the outcomes of the evaluation methods (systematization) used by the program developers. However, systematization did not get an equal amount of coverage as individual appraisal. It seems that reporting on individual appraisal is not as common as reporting on how that evaluation was measured. Other categories of reflexive monitoring were covered, though to a lesser extent than individual appraisal and systematization. Reconfiguration was identified occasionally, but few studies seemed interested in attempts to redefine or modify the intervention program. A residual theme on whether users would recommend the program to other was also identified, though it also received limited amounts of coverage. Communal appraisal was not covered at all, much in the same way that communal specification did not receive any coverage.

In sum, the content of knowledge was concentrated on a few sub-categories, with the most frequently reported being contextual integration, individual appraisal, activation and systematization. Out of the total number of meaning units, 7 % were coded on Coherence (72/1011), 15,5 % on Cognitive Participation (156/1011), 38,5 % on Collective action

(388/1011) and 39 % on Reflexive Monitoring (395/1011). A similar review by Mair et al. (2012) using the NPT as a conceptual framework to examine the amount of reporting on implementation of e-health systems found results that somewhat resembled these. Much like the current review, Coherence and Cognitive Participation did not receive much coverage (12 % and 11 % respectively). Collective Action was most frequently found in their data set (65 %), a finding that deviates somewhat from the current study. Most notably, only a small amount of information was found on Reflexive Monitoring (13 %), which is highly different from the current study in which statements concerning appraisal and feedback were the most frequent. There may be various reasons for why these findings differ, one of them being that Mair et al.'s paper was restricted to different kinds of reviews (systematic reviews, narrative reviews etc.), while the current review made no such limitation. The difference in the number of included articles (N = 37 against N = 255) could also have had an impact on the outcome of analysis. Additionally, the fields are somewhat different. Whereas Mair et al. examined e-health in general, this review was focused specifically on internet interventions for depression. This might indicate that the general field of e-health is less concerned with evaluation than what is common in the field of online depression interventions. On the other hand, Mair et al.'s review did not utilize a scoping review approach with the aim of summarizing the field of e-health interventions. Hence, these two reviews are not fully comparable.

Knowledge Gaps

The major finding of this review is that the reporting on implementation is very sparse, with only 51 % of papers reporting on relevant aspects. A substantial number of papers do not contain implementation information, and those who do tend to focus on a limited set of subjects rather than a wide range of possible implementation aspects. Hence, the principal knowledge gap lies in implementation overall, in the sense that many authors do not emphasize important factors for putting an intervention into practice. This absence of information could either be due to implementation not being studied or not being reported. It is not unlikely that most researchers are more attentive to implementation than what is evident from the literature, but that they fail to describe their experiences of putting interventions into practice in the published material. However, as this kind of reporting could provide useful insights for others seeking to implement the same type of intervention, the lack of reporting is a significant issue. Moreover, the reporting on empirical implementation findings is needed in order to further develop the field of implementation research.

The review has shown that many aspects of implementation are neglected, with only a few of the 16 sub-categories of the NPT being reasonably well-covered. Most notably, information relating to sense-making and understanding of an intervention (i.e. Coherence) is hardly ever represented in the literature. These findings indicate that there is another important knowledge gap, in the sense that there is very little systematic reporting of implementation in the literature. A more systematic or theory-based approach could aid researchers in focusing on a wide range of implementation aspects, as opposed to the small number of aspects presently being emphasized. Interestingly, there are a some papers that describe implementation in detail (e.g. Hadjistavropoulos et al., 2012; Kersting et al., 2011), but these do not utilize a theoretical approach. The current review could only identify four studies that made use of implementation theories (Carper et al., 2013; Eisen et al., 2013; Lovejoy et al., 2009; Van Voorhees et al., 2010), meaning that only 1,6 % (4/255) of all the reviewed intervention studies explicitly used a theoretical approach when putting their program into practice. If the remaining 98,4 % had applied a theoretical framework to their implementation efforts, they would have been less vulnerable to failure in finding intervention effectiveness due to poor implementation (i.e. type III error, see Bartholomew et al., 2011).

Ferlie and Shortell (2001) suggest that four levels should be considered when putting interventions into practice: individuals, groups, organizations and the larger system in which organizations are embedded. This relates to the third important knowledge gap identified in this review: the absence of reporting on the group, organization and system level. In total, 92 % of statements were coded on the user level (928/1011), 7 % were coded on the practitioner level (73/1011) and 1 % on the residual level (referring to a few statements on “developers” and “parents”; 10/1011). Researchers’ lack of emphasis on group-related processes are clearly evident in their failure to report on information relevant to the NPT sub-categories communal specification and communal appraisal. These group-based constructs relate to how individuals work collectively to build shared understandings and evaluations of an intervention. The NPT developers May and Finch (2009) point out that one of the underlying assumptions of the NPT is that it is “the contribution of both individuals and groups to the process that lead to implementation, embedding, and integration are interdependent” (p. 540). In other words, the way individuals contribute to an intervention is highly dependent of the contributions of the group. The fact that communal thoughts and actions (as well as organizational and larger system processes) are seemingly absent from the literature on online depression interventions suggests a notable gap in the literature. In sum, all reviewed papers that describe implementation information focus on the individual level, with most emphasis on the

intervention users, and fail to emphasize other levels. This is a major issue, especially considering how "strategies focusing on individuals alone in efforts to improve quality are seldom effective by themselves" (Ferlie & Shortell, 2001, p. 284).

Limitations

Even though this scoping review was highly systematic and was carefully executed, it has a few limitations. First, the NPT is only one of numerous other theories on implementation and dissemination. Since different theories conceptualize implementation in different ways, another theory might have a very different view of implementation. Had another framework or model been applied, the outcome might have been quite different. Therefore, the results presented here cannot be said to cover all features of implementation. Furthermore, as the theory is relatively new, it might contain unknown weaknesses or issues that are yet to be discovered, making it less suited for identifying relevant information. However, seeing how the NPT has been used successfully in previous studies on e-health initiatives (see Mair et al., 2012) and how it supports a multi-level approach (Murray et al., 2010), it is one of the best theories to apply to this review's research aim.

Second, an important limitation to the statistical testing is that the assumption of independence was disregarded for the second chi-square test. Normally, each case should be counted only once, meaning that they cannot appear in more than one category or group at a time (Pallant, 2010). In this case, the goodness-of-fit test (which assessed the distribution of reporting of all the NPT sub-categories) compared all articles that occurred within each of the four sub-categories. As one article could contain implementation-relevant information coded onto more than one of the sub-categories in the NPT theory (e.g. a paper with differentiation information might just as well contain internalization) the assumption of independence was violated. This can be seen clearly in the contingency table for the 16 sub-categories (Appendix F), in which the total row frequencies under "Yes" all outnumber total column frequencies (e.g. the total amount of articles coded onto Coherence is 25, and yet the total number of articles coded under "Yes" is 30), indicating that some articles must overlap in order to produce the seemingly nonsensical total row frequencies.

It should also be noted that if one author has written more than one article, this might impact the outcome of the analysis. It is likely that one author will tend to emphasize the same themes over a number of articles. For instance, if he or she has written extensively about post-intervention evaluation (Reflexive Monitoring) in one paper, it is probable that the same subject will appear in another paper by the same author. However, it is difficult to control for

this factor, as it is impossible to know how much one author has contributed to an article compared to other co-authors of the same article. Additionally, it would be difficult to weigh the responsibility of an author from one article to the next. For instance, if a person is the primary author of one article, but is the last co-author among a group of seven in another article, it would be inappropriate to weigh that person equally for both papers.

Finally, as the authors of the York framework point out, the sheer quantity of data produced by a scoping review can itself be problematic (Arksey & O'Malley, 2005). Dealing with such large amounts of material can make the review process quite challenging, especially during the stages in which raters have to select relevant studies (screening) and chart the key items of information (coding). These challenges were approached by working structured and systematically, applying inter-rater reliability and random sampling to ensure a high level of quality throughout all stages of the review.

Future Directions

Suggestions for practice. The current review has outlined an absence of a systematic approach to implementation. Developers should take this into consideration when planning future interventions. For instance, carefully structured implementation strategies could be applied when putting novel intervention programs into practice. An intervention guideline could utilize theory to ensure that some of the essential aspects of implementation are covered. This would improve the chances of the intervention being successfully adopted in practice, as well reducing the risk of poor intervention effects due to implementation-related issues.

Suggestions for research. The principal finding of this review is that there is a lack of knowledge on implementation of internet interventions for depression. This highlights the need for more research on implementation. An interesting approach would be to assess how different implementation strategies could impact the outcome of a web-based depression program. For instance, researchers could evaluate a Coherence-based workshop, in which users and practitioners were aided in their sense-making and understanding of the program. It would be interesting to see whether increasing individuals' understanding of an intervention could impact its overall implementation, and ultimately the intervention outcome.

The findings of this review show that there is a significant absence of reporting on multiple organizational levels. As this review has shown, most emphasis is placed on the individual level, with no focus being directed at the group, organization or larger system in which the intervention is set. Researchers would gain by taking more than one level into

account, or simply focusing on the levels that have not yet been examined, when conducting future studies. The impact of group processes and organizational forces on the implementation of internet interventions for depression is a hitherto untapped source of knowledge that is worthy of examination.

Finally, a potential source of additional information is to perform a similar review to this one, but utilize a different theoretical framework. As discussed above, a different theory that would conceptualize implementation in a different way than the NPT, might provide a different outcome than the one presented here. It would be interesting to utilize a different framework, such as the Diffusion of Innovations Theory or the RE-AIM Framework, to see whether the results might reveal a different picture of the implementation of internet interventions for depression.

Conclusion

This review breaks new ground in the sense that it attempts to cover the entire field of internet interventions for depression in order to identify gaps in the literature on implementation. The systematic approach of utilizing two raters, a comprehensive literature search and random sampling to assess validity, lends confidence to the findings as it reduces the risk of information being omitted. Moreover, the review not only summarizes data in terms of frequencies, but also analyzes and interprets it within a theoretical framework.

The findings presented in this study contribute to the understanding of the amount of literature on implementation in the field of internet interventions for depression. One of the principal findings was that a large number of articles do not contain any information relevant to implementation whatsoever. By failing to account for implementation-related phenomena, developers may fail to understand why their intervention is either successful or ineffective. Additionally, they might end up making a type III error, by being unable to find intervention effectiveness because of poor design or implementation. Despite generally poor reporting on implementation, certain implementation aspects such as sustaining an intervention over time (activation), appraisal of acceptance-related variables (individual appraisal) and features that concern the overall compatibility with the intervention (contextual integration), are relatively well-covered. However, this information pertains primarily to users of the interventions, and to a lesser extent the practitioners. Furthermore, most papers in the data set neglect to describe ways their interventions are impacted by group processes or organizational structures. This is problematic, as implementation is a complex process that touches upon many organizational levels, not just the individual level. These findings indicate that the field of internet

interventions on depression require a great deal of research on implementation, especially in areas that relate to other organizational levels than intervention users. More research is needed to explore how the implementation of internet interventions can be improved, as well as what implementation factors are the most influential in providing a successful intervention program.

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Appendixes

Appendix A

Search Strategy
18th of march 2014
Search by Sølvi Biedilæ

#	Searches
1	exp Internet/
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.
3	1 or 2
4	exp Therapeutics/
5	exp Psychotherapy/
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.
7	4 or 5 or 6
8	exp Depression/ or exp Depressive Disorder/
9	depress*.tw.
10	8 or 9
11	3 and 7 and 10

Appendix B

Inclusion and Exclusion Criteria for the Screening Process

Internet		Intervention		Depression		Implementation	
Include	Exclude	Include	Exclude	Include	Exclude	Include	Exclude
cyberpsych*	admin* system	counsel*	intervent* protocol*	depress*	affect*	adopt*	
cybertherap*	app*	educati*	method*	depressive symptoms	affect* disorder*	barrier* to use	
e-health	archiv* system	intervent*	non-empirical		anxi*	deploy*	
e-mental health	artificial intelligence (AI)	program* psych*	study protocol*		behavio* change	design	
e-psych*	cd	intervention	theor*		bereavement	development	
e-therap*	cd rom	psych* treatment	theor* method*		bipolar depress*	diffus*	
internet	cell* phone	psychotherap*	theor* method*		body dysmorphi*	disseminat*	
online*	clinical admin* system	self-care			chronic disease*	distribut*	
web*	clinical decision-support system	self-control			chronic ill*	embed*	
website	computing intelligence (CI)	self-help			disease	evidence-based*	
	decision-support system	self-management			emotional disorder	execut*	
	diagnos*	supervis*			emotional dysregulation	implement*	
	digital archiv* system	therap*			emotional instability	innovat*	
	dvd	train*			health behavio*	integrat*	
	dvd-rom	treat*			illness	knowledge transfer*	
	e-learning				maladjustment	knowledge translat*	
	electronic health record (EHR)				mood disorder*	long tail*	
	health record				mood*	normaliz*	
	human-robot interaction				obsessive-compulsive*	performance evaluat*	
	interactive television				panic	program evaluat*	
	interactive voice response (IVR)				paranoi*	reach*	

m-health
mobile
monitor*
palmtop comput*
personal health record (PHR)
robot*
screening
sensor technolog*
short message service (SMS)
smartphone
telecar*
telecomm*
telemed*
telephone
telephone-based
telepsych*
television (TV)
test*
text messag*
treatment guide*
treatment plan*
video
video-based
virtual reality (VR)
virtual*
phobi
phobi*
posttraumatic stress*
psych* health
psycho*
ptsd
schizophren*
self-esteem
stress*
well-being
realiz*
routin*
spread*
technology transfer*
utili*

Appendix C

NPT and Level Coding Framework

Codebook of NPT Components

	Value	NPT sub-component	Definition
Coherence			
	1	Differentiation	Understanding of how a set of practices and their objects are different from each other
	2	Individual specification	Personal understanding of specific tasks and responsibilities
	3	Communal specification	A shared understanding of tasks and responsibilities
	4	Internalization	Understanding of the value, benefits and importance of a set of practices
Cognitive Participation	1	Legitimation	A belief it is right to be involved/whether one "buys into" the intervention
	2	Enrolment	Reorganization of work to participate in a new intervention
	3	Initiation	Whether key individuals are willing to drive the intervention
	4	Activation	Sustainment of the intervention and staying involved
Collective Action	1	Skill set workability	The degree to which the intervention fits with existing working practices, skill sets and job role
	2	Contextual integration	The degree of overall contextual fit with the intervention
	3	Interactional wokability	The impact of the intervention on the work done in a consultation
	4	Relational integration	The way in which different professional groups relate to each other
Reflexive Monitoring	1	Systematization	How one evaluates the effectiveness and usefulness of an intervention
	2	Individual appraisal	Personal evaluation of the effect of the intervention
	3	Communal appraisal	Collective evaluation of the effect of the intervention
	4	Reconfiguration	Attempts to redefine or change the intervention in any way

Organizational Level	Value	Label
	0	User/client/recipient
	1	Practitioner
	2	Supervisor
	3	Team/group
	4	Leadership/management
	5	Organization
	6	Residual

Appendix D

Overview of NPT Categories

Normalization Process Theory

1. Coherence	2. Cognitive Participation	3. Collective Action	4. Reflexive Monitoring
Differentiation	**Legitimation**	**Skill Set Workability**	**Systematization**
Understanding of how a practice and its objects are different from each other	A sense of believing it is right to be involved in a new practice	The way the new practice fits with existing working practices, skill sets, job role and training needs	Refers to the various ways evaluation information is gathered
Individual Specification	**Enrolment**	**Contextual Integration**	**Individual Appraisal**
Whether individuals have a personal understanding of the tasks and responsibilities associated with the intervention	The ways people prepare themselves to make a shared contribution to the new practice	The overall suitability of the new practice with existing practices	Individuals' evaluation of a practice
Communal Specification	**Initiation**	**Interactional Workability**	**Communal Appraisal**
Concerns whether individuals have a shared understanding of the tasks and responsibilities associated with the intervention	The ability and willingness of key individuals to get others involved in the new practice	The influence of the new practice on the interaction between people	The way groups evaluate a new practice
Internalization	**Activation**	**Relational Integration**	**Reconfiguration**
Denotes the understanding of values, benefits and importance of an intervention	The actions and procedures needed to stay involved in a practice over time	How the practice fits with existing relationships among groups	The workarounds that people attempt when they perceive that the intervention is not working

Appendix E

Contingency Tables of the Contrasting of Reporting of Relevant Information to the Four Core Categories of NPT

Contrast 1

		Coherence		
		Yes	No	Total
Cognitive Participation	Yes	13	47	60
	No	12	183	195
	Total	25	230	255

Contrast 2

		Coherence		
		Yes	No	Total
Collective Action	Yes	20	47	67
	No	5	183	188
	Total	25	230	255

Contrast 3

		Coherence		
		Yes	No	Total
Reflexive Monitoring	Yes	17	71	88
	No	8	159	167
	Total	25	230	255

Contrast 4

		Cognitive Participation		
		Yes	No	Total
Collective Action	Yes	29	38	67
	No	31	157	188
	Total	60	195	255

Contrast 5

		Cognitive Participation		
		Yes	No	Total
Reflexive Monitoring	Yes	33	55	88
	No	27	140	167
	Total	60	195	255

Contrast 6

		Collective Action		
		Yes	No	Total
Reflexive Monitoring	Yes	44	44	88
	No	23	144	167
	Total	67	188	255

Appendix F

Contingency Table of Articles Reporting Relevant Information to the Sixteen Sub-Categories of the NPT

		Yes	No	Total
Coherence	Differentiation	5	20	25
	Individual specification	5	20	25
	Communal specification	0	25	25
	Internalization	20	5	25
	Total	30	70	
Cognitive Participation	Legitimation	13	47	60
	Enrolment	5	55	60
	Initiation	0	60	60
	Activation	49	11	60
	Total	67	173	
Collective Action	Skill Set Workability	24	43	67
	Contextual Integration	48	19	67
	Interactional Workability	19	48	67
	Relational Integration	2	65	67
	Total	93	175	
Reflexive Monitoring	Systematization	59	29	88
	Individual Appraisal	80	8	88
	Communal Appraisal	0	88	88
	Reconfiguration	6	82	88
	Total	145	207	

Note: only the “Yes” category data served as the basis for the chi-square analysis. The “No” data are shown here to provide a visual comparison to the number of non-relevant papers.

Appendix G

The Number of Units Coded Onto Each Sub-Category of the NPT

Coherence		**Cognitive Participation**		**Collective Action**		**Reflexive Monitoring**	
Differentiation	11	Legitimation	22	Skill Set Workability	88	Systematization	97
Individual specification	10	Enrolment	6	Contextual Integration	242	Individual appraisal	236
Communal specification	0	Initiation	0	Interactional Workability	53	Communal appraisal	0
Internalization	49	Activation	124	Relational Integration	5	Reconfiguration	38
Residual	2	Residual	4	Residual	0	Residual	24
Total	72	Total	156	Total	388	Total	395

Appendix H

Most Frequently Reported Questionnaires

Questionnaire Type

		Frequency	Percent
Valid	Client Satisfaction Questionnaire (CSQ)	6	7 %
	Credibility/Expectancy Questionnaire (CEQ)	4	5 %
	System Usability Scale (SUS)	3	4 %
	Therapy Attitude Inventory	1	1 %
	Treatment Expectancy and Outcomes Questionnaire	1	1 %
	HAT form	1	1 %
	Not determinable	63	74 %
	Residual	2	2 %
	Not a questionnaire	4	5 %
	Total	85	100 %
Missing	9999	969	
Total		1051	

Appendix I

All Identified Articles on Internet Interventions for Depression

First author	Year	Title
Allen, M	2008	Improving patient-clinician communication about chronic conditions - Description of an Internet-based nurse e-coach intervention
Almlov, J	2009	Therapist factors in Internet-delivered cognitive behavioural therapy for major depressive disorder
Amstadter, A B	2009	Internet-based interventions for traumatic stress-related mental health problems: a review and suggestion for future research
Andersson, G	2004	Behavior therapy cognitive Internetbasierte fiir easy until middle depression: Prediction of the therapy success after 6-monatiger Katamnese
Andersson, G	2004	Delivering cognitive behavioral therapy for mild to moderate depression via the internet: Predicting outcome at 6-month follow-up
Andersson, G	2005	Internet-based self-help for depression: randomised controlled trial
Andersson, G	2009	Internet-based and other computerized psychological treatments for adult depression: a meta-analysis
Andersson, G	2012	Therapeutic alliance in guided internet-delivered cognitive behavioural treatment of depression, generalized anxiety disorder
Andersson, G	2013	A 3.5-year follow-up of Internet-delivered cognitive behavior therapy for major depression
Andersson, G	2013	Effectiveness of guided internet-based cognitive behavior therapy in regular clinical settings
Andersson, G	2013	Effects of two forms of Internet-delivered cognitive behaviour therapy for depression on future thinking
Andersson, G	2013	Randomised controlled non-inferiority trial with 3-year follow-up of internet-delivered versus face-to-face group
Andrews, G	2010	Computer therapy for the anxiety and depressive disorders is effective, acceptable and practical health care: a meta-analysis
Bae, J	2009	Development of a user-centered health information service system for depressive symptom management
Barazzone, N	2012	Computerized cognitive behavioural therapy and the therapeutic alliance: A qualitative enquiry
Barrera, A Z	2014	Keywords to recruit Spanish- and English-speaking participants: evidence from an online postpartum depression randomized controlled trial
Batterham, P J	2008	Predictors of adherence among community users of a cognitive behavior therapy website
Beattie, A	2009	Primary-care patients' expectations and experiences of online cognitive behavioural therapy for depression: a qualitative study
Bell, V	2007	Online information, extreme communities and internet therapy: is the internet good for our mental health?
Bendelin, N	2011	Experiences of guided Internet-based cognitive-behavioural treatment for depression: a qualitative study
Berger, T	2011	Internet-based treatment of depression: a randomized controlled trial comparing guided with unguided self-help
Boggs, J M	2014	Web-based intervention in mindfulness meditation for reducing residual depressive symptoms and relapse prophylaxis: a qualitative study
Bolier, L	2013	An internet-based intervention to promote mental fitness for mildly depressed adults: randomized controlled trial
Bowie, Christopher R	2013	Cognitive remediation for treatment-resistant depression: effects on cognition and functioning and the role of online homework
Brakemeier, E L	2013	CBASP@home: Ein internetbasiertes situationsanalysen-training zur stabilisierung des therapieerfolgs nach stationarer therapie
Button, K S	2012	Factors associated with differential response to online cognitive behavioural therapy
Calear, A L	2009	The YouthMood Project: a cluster randomized controlled trial of an online cognitive behavioral program with adolescents
Calear, A L	2010	Review of internet-based prevention and treatment programs for anxiety and depression in children and adolescents
Calear, A L	2013	Adherence to the MoodGYM program: outcomes and predictors for an adolescent school-based population

Carlbring, P	2013	Internet-based behavioral activation and acceptance-based treatment for depression: a randomized controlled trial
Carper, M M	2013	The Dissemination of Computer-Based Psychological Treatment: A Preliminary Analysis of Patient and Clinician Perceptions
Choi, I	2012	Culturally attuned Internet treatment for depression amongst Chinese Australians: a randomised controlled trial
Choi, M	2012	Computer and internet interventions for loneliness and depression in older adults: a meta-analysis
Christensen, H	2002	Web-based cognitive behavior therapy: analysis of site usage and changes in depression and anxiety scores
Christensen, H	2004	A comparison of changes in anxiety and depression symptoms of spontaneous users and trial participants of a cognitive behavior therapy website
Christensen, H	2004	Delivering interventions for depression by using the Internet: randomised controlled trial
Christensen, H	2006	Free range users and one hit wonders: community users of an Internet-based cognitive behaviour therapy program
Christensen, H	2006	Online randomized controlled trial of brief and full cognitive behaviour therapy for depression
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
Christensen, H	2009	Adherence in internet interventions for anxiety and depression
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de Graaf, L E	2010	Predicting outcome in computerized cognitive behavioral therapy for depression in primary care: A randomized trial
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García-Lizana, F	2010	Telemedicine for depression: a systematic review
Gerhards, S A	2011	Improving adherence and effectiveness of computerised cognitive behavioural therapy without support for depression
Gerhards, S A H	2011	Economic evaluation of online computerized cognitive behavioural therapy without support for depression in primary care: A randomized trial
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