



## Internet-supported versus face-to-face cognitive behavior therapy for depression

Gerhard Andersson, Naira Topooco, Odd Havik & Tine Norgreen

To cite this article: Gerhard Andersson, Naira Topooco, Odd Havik & Tine Norgreen (2015): Internet-supported versus face-to-face cognitive behavior therapy for depression, Expert Review of Neurotherapeutics, DOI: [10.1586/14737175.2015.1125783](https://doi.org/10.1586/14737175.2015.1125783)

To link to this article: <http://dx.doi.org/10.1586/14737175.2015.1125783>



Accepted author version posted online: 26 Nov 2015.



Submit your article to this journal [↗](#)



Article views: 12



View related articles [↗](#)



View Crossmark data [↗](#)

**Publisher:** Taylor & Francis

**Journal:** *Expert Review of Neurotherapeutics*

**DOI:** 10.1586/14737175.2015.1125783

**Internet-supported versus face-to-face cognitive behavior therapy for depression**

AUTHOR LIST:

Gerhard Andersson<sup>1,2</sup>

Naira Topooco<sup>1</sup>

Odd Havik<sup>3,4</sup>

Tine Norgreen<sup>3,4</sup>

1 Department of Behavioural Sciences and Learning, Linköping University, Sweden

2 Department of Clinical Neuroscience, Psychiatry Section, Karolinska Institutet, Sweden

3 Department of Clinical Psychology, University of Bergen, Norway

4 Haukeland University Hospital, Norway

CORRESPONDING AUTHOR:

Gerhard Andersson, PhD

Department of Behavioural Sciences and Learning

Linköping University

SE-58183 Linköping

Sweden

E-mail: [gerhard.andersson@liu.se](mailto:gerhard.andersson@liu.se)

### Abstract

Major depression and depressive symptoms are highly prevalent and there is a need for different forms of psychological treatments that can be delivered from a distance at a low cost. In the present review the authors contrast face-to-face and internet-delivered cognitive behavior therapy (ICBT) for depression. A total of five studies are reviewed in which guided ICBT was directly compared against face-to-face CBT. Meta-analytic summary statistics were calculated for the five studies involving a total of 429 participants. The average effect size difference was Hedges  $g = 0.12$  (95% CI: -0.06~0.30) in the direction of favoring guided ICBT. The small difference in effect has no implication for clinical practice. The overall empirical status of clinician-guided ICBT for depression is commented on and future challenges are highlighted. Among these are developing treatments for patients with more severe and longstanding depression and for children, adolescents and the elderly. Also, there is a need to investigate mechanisms of change.

Key words: internet delivery, cognitive behavior therapy, face-to-face treatment, depression, mood disorders

## Introduction

Major depression is a common disorder and even more common are depressive symptoms [1]. A challenge for clinicians is not only to treat depression when it occurs but also to prevent relapse. In addition, minor depression can also be treated and this can be a way to prevent the onset of a full depressive episode [2]. There are numerous treatments for depression including medication and a range of psychological treatments [3]. Interestingly, psychological treatments tend to be preferred by many patients and initial evidence suggests that psychological treatments may be more suitable to prevent relapse compared to medication [4].

In spite of efforts to disseminate evidence-based psychological treatments for depression - most often cognitive behavior therapy (CBT) and interpersonal psychotherapy (IPT) - there is a need for treatment alternatives that are easily accessible and less costly. One way to handle this challenge is to deliver psychological treatment in the form of guided self-help via the internet [5]. Even if there are examples of psychodynamic internet treatment [6] and physical exercise [7] for depression, most studies and clinical implementations have been in the form of internet-delivered CBT (ICBT). ICBT was developed in the mid 1990s and has since been the topic of intensive research and implementation efforts with more than 120 randomized controlled trials and an increasing number of effectiveness studies [8]. There are various forms of ICBT ranging from automated self-guided treatments to real time chat-based treatment via video-conferencing [9]. When it comes to depression evidence suggests that clinician-guided treatments in terms of outcome are superior to self-guided treatments [10]. One way to describe clinician-guided ICBT is to contrast this treatment against regular face-to-face CBT. This is presented in **Table 1**.

The aim of this paper is to review the literature on clinician-guided ICBT for depression and depressive symptoms, and how well ICBT compares against face-to-face

CBT. We begin with an updated brief review on the evidence-base for guided ICBT and then provide a meta-analytic summary of studies contrasting face-to-face and therapist guided ICBT for depression and depressive symptoms, including a recent study on smartphone and internet-delivered treatment. We conclude by discussing future research needs and a selection of topics concerning ICBT for depression.

### **The evidence base for ICBT for depression**

Depression has been the focus of ICBT research since the early 2000s and there are several systematic reviews and meta-analyses available. One uncertainty in this literature is the mixing of computerized CBT and ICBT, but increasingly the latter is less frequent and ICBT studies tend to dominate the reviews in terms of number of controlled trials. One example of a review including both computerized treatment overall and ICBT is a meta-analysis from 2009 in which the overall effect of ICBT and computerized treatments for depression were investigated [11]. The authors included 15 comparisons and found that the overall effect size (Cohen's  $d$ ) was  $d = 0.41$ . This effect size was significantly moderated by a difference between guided ( $d = 0.61$ ) and unguided ( $d = 0.25$ ) treatments. A more recent updated review of the same literature included 19 controlled trials [12]. Again, these researchers also included computerized CBT even if ICBT dominated. Results were in line with the previous meta-analysis with an average effect of  $d = 0.56$  against control and a moderating effect of support. Indeed, the authors found that a standardized mean difference (Cohen's  $d$ ) of  $d = 0.78$  for guided interventions,  $d = 0.58$  for treatments with administrative support, and  $d = 0.36$  for studies without any guidance. This is in line with a review focused on ICBT only [10] and with another a more recent meta-analytic review [13].

Increasingly, data on long-term effects of ICBT are being collected and also treatments that are directly aimed at preventing relapse in patients with residual symptoms [14,15]. One example is a long-term follow-up study that reported maintained treatment gains at a 3.5 year follow-up [16] and in another trial a three year follow-up was included [17] showing maintained reduced depression levels. Another therapist-assisted treatment program, Interapy, has also been found to generate long-term outcomes in an 18-month follow-up [18]. Several studies have included shorter follow-up periods such as 6 months post-treatment [19].

Given the number of controlled studies it is motivated to ask how well clinician guided ICBT works in more clinically representative settings. This was the topic of a review from 2013 [20], and since that publication a large effectiveness study on depression ( $N = 1203$ ) has been published with data from the internet psychiatry unit at Karolinska University Hospital in Sweden [21]. Results showed that guided ICBT lead to significant reductions of depression symptoms with a large within-group effect size ( $d = 1.27$ ). They also included a 6 months follow-up with large effects (which had substantial loss of data). Another example of how ICBT has been found to work in regular clinical settings was provided for the Interapy program [22]. A third example of effectiveness data was provided by an Australian research group who reported data from 359 patients treated with ICBT in primary care [23].

Overall, this brief update of the literature suggests that ICBT continues to be found to be effective in controlled trials [10,24], that long-term effects have been observed and that effectiveness data are being published, with all pointing in the direction of ICBT being as effective as face-to-face CBT. However, without direct comparisons within trials the notion of equivalence cannot be assumed as patients in ICBT and face-to-face trials may differ. Thus we now turn to the controlled studies on ICBT versus face-to-face CBT for depression.

### As effective as face-to-face?

There are two previous meta-analysis, with one on the contrast between guided self-help and face-to-face therapy for anxiety and depression [25], and another on the direct comparison between ICBT and face-to-face therapy [26]. Both showed no differences between the treatment formats. The latter meta-analysis only included two trials on depression/depressive symptoms and we therefore decided to do an updated search for trials contrasting ICBT and face-to-face CBT. To identify studies, systematic searches in PubMed (Medline database) were conducted in November 2015 using various search terms (e.g., “internet versus face-to-face”, “web-based AND face-to-face”, “web-based versus group”), and these terms were combined with the term “depress\*”, and the search filter “randomized controlled trial” was used. We also consulted other databases (Scopus, Google Scholar and PsychInfo), and reference lists of recent studies and reviews on internet interventions. In total we were able to include five controlled trials in this review after screening abstracts of 947 studies. In contrast to the overall status of ICBT, with a rapid increase of controlled trials [27], comparative trials involving face-to-face treatments are slower to conduct and hence more rare. We will first review the trials and in the next section calculate meta-analytic statistics.

To our knowledge the first controlled trial comparing face-to-face and ICBT for depressive symptoms was conducted in the Netherlands [28]. The researchers included 201 participants (mean age 55 years; 63 % females) in their trial in which they compared unguided ICBT and group CBT based on Lewinsohn’s Coping With Depression course [29]. They also included a waiting-list control condition. The treatments lasted for 10 weeks. There was a notable dropout rate with 34 % in ICBT and 43 % in the group CBT dropping out and not providing post-treatment data. Overall, both groups improved and the within-group effect was  $d = 1.0$  for ICBT and  $d = 0.65$  for the group treatment, but the two did not differ

significantly. A subsequent one-year follow-up study was published [30] showing that the lack of significant difference between the two treatments remained. Adverse events or deterioration were not mentioned.

In a second study retrieved, Wagner et al. compared guided ICBT for depression to face-to-face treatment, with the difference being that it was individual treatment and not group treatment [31]. They included 62 participants in the study (mean age 38 years; 64% females), and while there was no structured diagnostic interview, depression was defined as elevated scores on a self-report measure. The treatments lasted for 8 weeks and there was a 3-months follow-up. There was a somewhat larger dropout from the ICBT group (7 vs. 2 in the face-to-face group), and in particular at 3-months follow-up only 37/62 completed outcome measures. Both groups displayed large within-group effects ( $d = 1.27$  and  $1.37$  at post-treatment for ICBT and face-to-face treatment respectively). However, at 3-months follow-up there was a clear tendency for the ICBT group to fare better with a between-group effect of  $d = 0.61$  in favour of ICBT. This was explained by a significant worsening on BDI-II scores in the face-to-face group. The authors reported deterioration in the face-to-face group but no correspondent proportion of deterioration in the ICBT group.

In a study from our group we compared guided ICBT against face-to-face group treatment in a sample of 69 persons diagnosed with depression (mean age 42 years; 78% female), and recruited from the general public. In addition, to post-treatment data we also included follow-up data at 1 year and 3 years after treatment with randomization maintained [17]. The treatments lasted for 8 weeks and were similar in contents. Dropout rates varied during the course of the trial, but were generally low with as many as 62 completing the 3-year follow-up (90 %). There were large within-group effects for both treatments (Cohen's  $d$ 's above 1.0) and non-inferiority analyses could confirm non-inferiority of guided ICBT. Indeed, there was even a tendency for the guided ICBT group to be superior to the group-

based CBT condition at 3-year follow-up. No participant in either group had deteriorated at post-treatment as assessed by a clinical interview. However it is important to note that some participants had received additional therapy at the time of the 3-year follow-up (19 psychological treatment and 13 change of medication). Percentages of participants who had received additional psychological treatments during the follow-up period did not differ as a function of condition (ICBT=10 vs. group-CBT=9).

A fourth study compared guided ICBT against face-to-face treatment, but with both interventions being based on based on a form of CBT called Acceptance and Commitment Therapy (ACT) [32]. As with the Wagner et al. trial participants were not diagnosed with depression in a diagnostic interview. The Internet treatment (called iACT) and the individual face-to-face treatments lasted for 6 weeks. The iACT involved two visits at the clinic. Participants were recruited from the general public via advertisements, and in total 38 persons were randomized to either condition (mean age 45 years; 68 % females). There was almost no dropout ( $n = 1$ ) at post-treatment and follow-up assessments, the last one being at 18 months post-treatment. Results on the BDI-II showed large within-group effects, including large pre-to follow-up effects (Hedge's  $g = 1.59$  for the iACT group and 1.37 for the ACT group). There were also indications that the Internet condition fared better than the face-to-face treatment at 6-month follow-up with a between group effect on the BDI-II of  $g = 0.76$ . Deterioration was reported but no participant deteriorated during the trial.

A recent study compared a smartphone-delivered treatment including four brief live sessions against a full 10-session behavioral activation treatment [33], both delivered during a 10 week treatment period. The authors included 93 participants with depression (mean age 31 years; 70 % females). Primary outcome measure was the Beck Depression Inventory (BDI-II) [34], and in addition to pre- and post-measures a six months follow-up was included. Results showed large within-group effects ( $d = 1.35$  to 1.47), and only three participants dropped out

(at the 6-month follow-up this had increased to 16 participants). There were small differences between the groups. Adverse events or deterioration were not reported.

### **Meta-analytic summary**

We used the program Comprehensive Meta-Analysis (version 2.2.021; CMA) to calculate pooled mean effect sizes for the contrast between ICBT and face-to-face CBT. A forest plot for the five studies is presented in Figure 1. In total there were 229 participants who had been randomized to guided ICBT (in one case iACT and in one case smartphone treatment with four brief live sessions) and 200 who had been randomized to face-to-face CBT (in two studies group treatment). All studies used the Beck Depression Inventory II, which we used for the calculation of effect sizes. The overall random effects between-group effect size was Hedge's  $g = 0.12$  (95% CI: -0.06~0.30) in the direction of favoring guided ICBT and with no signs of heterogeneity ( $I^2=00\%$ ). Duvall and Tweedie's trim and fill procedure and Egger's test also did not suggest publication bias (as implemented in CMA). Thus on the basis of the five controlled studies guided ICBT and face-to-face CBT appears to be equally effective.

### Expert commentary & five-year view

Major depression and sub-clinical depressive symptoms are costly problems for society and there is a need for psychological treatments that can complement other services and be reached from a distance. Systematic reviews and meta-analysis of controlled trials suggest that guided ICBT can be as effective as face-to-face CBT and there are also studies indicating that ICBT for depression has enduring effects and can be delivered effectively in regular clinical settings. We show here that direct comparative studies also point in the same direction with no clinically relevant difference between ICBT and face-to-face CBT. However, most trials have been small and cost-effectiveness has not been reported yet. For example, therapist time spent has not been consistently reported and hence cannot be stated in any detail. Moreover, it is possible that for some patients ICBT is better and for others face-to-face CBT. Even if we believe we have located the published trials and did not find any registered additional ongoing trials, it is possible that unpublished trials exist. However, it is not necessarily the case that a bias exist in favour of ICBT as this treatment format sometimes is referred to as low-intensity and regarded as inferior by experienced face-to-face therapist. Further, in spite of a call for reporting of negative outcomes [35], there are still studies that fail to report this. Moreover, most studies have been conducted in Europe and Australia but increasingly ICBT is being adapted for other non-western cultures [36].

Future research in the upcoming five years could focus on severe depression and/or more chronic forms of depression such as dysthymia. Psychological treatments usually do better for these conditions when combined with medication [37], but is possible that the duration and format of the treatment may need to be altered. Internet delivery would facilitate long-term treatments but this has not yet been explored. Further, problems with memory and retention of session content can be handled with the use of the internet as treatment components can be repeated. Moreover, in ICBT comorbid symptoms can be included as

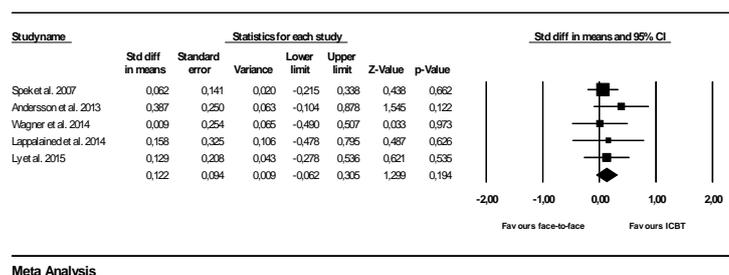
targets for intervention and treatment content can be adapted according to motivation and reading level [19]. Other forms of affective disorder such as bipolar disorder has not yet been the focus on much ICBT but could very well serve as a complement to other services [38]. Another task for the future is to develop and test guided ICBT for adolescents and older adults with depression. There are studies suggesting that ICBT for depression can work for adolescents [39] and older adults [40], but more studies are needed. Another possible future line of research is to focus on knowledge acquisition as there are only a few studies on what clients remember and actually learn from their treatments [41]. Finally, as with all intervention research involving multi-component treatment packages there is a need for studies on moderators and mediators of change as a way to further develop interventions and to understand what makes ICBT work [42].

### Key issues

- Internet-based cognitive behavior therapy has been tested in many trials showing good results when guidance from a clinician is provided.
- Increasingly, long-term effects of guided ICBT has been documented.
- There are also studies conducted in regular clinical settings suggesting that ICBT works in real life.
- To date there are few direct comparative studies but the five studies included here all suggest that guided ICBT can be as effective as face-to-face CBT.
- Future studies could focus on more severe and chronic cases of depression, other age groups than adults (older adults and adolescents), and mechanisms of change.

## Figure legend

FIGURE 1: Forest plot of studies comparing guided internet-delivered cognitive behavior therapy against face-to-face cognitive behavior therapy.



### *Financial and competing interests disclosure*

This paper was sponsored in part by the Swedish research council, Linköping University (Professor contract) and the E-COMPARED project (EC funded). The authors have no other relevant affiliations or financial involvement with any organization or entity with a financial interest in or financial conflict with the subject matter or materials discussed in the manuscript apart from those disclosed.

## References

Papers of special note have been highlighted as:

- of interest
- of considerable interest

1. Ebmeier KP, Donaghey C, Steele JD. Recent developments and current controversies in depression. *Lancet*, 367, 153-167 (2006).
2. van Zoonen K, Buntrock C, Ebert DD *et al.* Preventing the onset of major depressive disorder: a meta-analytic review of psychological interventions. *Int J Epidemiol*, 43, 318-329 (2014).
3. Gotlib IH, Hammen CL (eds.) *Handbook of depression* (The Guilford Press, New York, 2009).
4. Cuijpers P, Hollon S, Van Straten A, Bockting C, Berking M, Andersson G. Does cognitive behaviour therapy have an enduring effect that is superior to keeping patients on continuation pharmacotherapy? A meta-analysis. *BMJ Open*, 3, e002542 (2013).
5. Andersson G. Using the internet to provide cognitive behaviour therapy. *Behav Res Ther*, 47, 175-180 (2009).
6. Johansson R, Ekbladh S, Hebert A *et al.* Psychodynamic guided self-help for adult depression through the Internet: a randomised controlled trial. *PLoS ONE*, 7 (5), e38021 (2012).

- **Controlled trial suggesting that other forms of psychotherapy than CBT can be effective**

7. Ström M, Uckelstam C-J, Andersson G, Hassmén P, Umefjord G, Carlbring P. Internet-delivered therapist-guided physical activity for mild to moderate depression: A randomized controlled trial. *PeerJ*, 1, e178 (2013).
8. Andersson G. Internet-delivered psychological treatments. *Ann Rev Clin Psychol*, (In press).
9. Andersson G. *The internet and CBT: A clinical guide* (CRC Press, Boca Raton, 2014).

• **Book length review of internet-delivered cognitive behavior therapy**

10. Johansson R, Andersson G. Internet-based psychological treatments for depression. *Expert Rev Neurother*, 12, 861-870 (2012).
11. Andersson G, Cuijpers P. Internet-based and other computerized psychological treatments for adult depression: A meta-analysis. *Cogn Behav Ther*, 38, 196-205 (2009).
12. Richards D, Richardson T. Computer-based psychological treatments for depression: a systematic review and meta-analysis. *Clin Psychol Rev*, 32, 329-342 (2012).
13. Cowpertwait L, Clarke D. Effectiveness of web-based psychological interventions for depression: A meta-analysis. *Int J Ment Health Addiction*, 11(2), 247-268 (2013).
14. Holländare F, Johnsson S, Randestad M *et al*. Two-year outcome for Internet-based relapse prevention for partially remitted depression. *Behav Res Ther*, 51, 719-722 (2013).
15. Holländare F, Johnsson S, Randestad M *et al*. Randomized trial of internet-based relapse prevention for partially remitted depression. *Acta Psychiatr Scand*, 124, 285-294 (2011).

• **Controlled trial suggesting that relapse in depression can be prevented**

16. Andersson G, Hesser H, Hummerdal D, Bergman-Nordgren L, Carlbring P. A 3.5-year follow-up of Internet-delivered cognitive behaviour therapy for major depression. *J Mental Health*, 22, 155-164 (2013).
17. Andersson G, Hesser H, Veilord A *et al.* Randomized controlled non-inferiority trial with 3-year follow-up of internet-delivered versus face-to-face group cognitive behavioural therapy for depression. *J Affect Disord*, 151, 986-994 (2013).
18. Ruwaard J, Schrieken B, Schrijver M *et al.* Standardized web-based CBT of mild to moderate depression: A randomized controlled trial with a long-term follow-up. *Cogn Behav Ther*, 38, 206-221 (2009).
19. Johansson R, Sjöberg E, Sjögren M *et al.* Tailored vs. standardized Internet-based cognitive behavior therapy for depression and comorbid symptoms: A randomized controlled trial. *PLoS ONE*, 7(5), e36905 (2012).
20. Andersson G, Hedman E. Effectiveness of guided Internet-delivered cognitive behaviour therapy in regular clinical settings. *Verhaltenstherapie*, 23, 140-148 (2013).

• **Review of effectiveness studies on ICBT.**

21. Hedman E, Ljótsson B, Kaldø V *et al.* Effectiveness of Internet-based cognitive behaviour therapy for depression in routine psychiatric care. *J Affect Disord*, 155, 49-58 (2014).
22. Ruwaard J, Lange A, Schrieken B, Dolan CV, Emmelkamp P. The effectiveness of online cognitive behavioral treatment in routine clinical practice. *PLoS One*, 7(7), e40089 (2012).
23. Williams AD, Andrews G. The effectiveness of Internet cognitive behavioural therapy (iCBT) for depression in primary care: a quality assurance study. *PLoS One*, 8, e57447 (2013).

24. Andersson G. Internet based cognitive behavioral self-help for depression. *Expert Rev Neurother*, 6, 1637-1642 (2006).
25. Cuijpers P, Donker T, van Straten A, Andersson G. Is guided self-help as effective as face-to-face psychotherapy for depression and anxiety disorders? A meta-analysis of comparative outcome studies. *Psychol Med*, 40, 1943-1957 (2010).
26. Andersson G, Cuijpers P, Carlbring P, Riper H, Hedman E. Internet-based vs. face-to-face cognitive behaviour therapy for psychiatric and somatic disorders: a systematic review and meta-analysis. *World Psychiatry*, 13, 288-295 (2014).

•• **Meta-analysis of studies comparing ICBT against face-to-face CBT showing no difference.**

27. Hedman E, Ljótsson B, Lindefors N. Cognitive behavior therapy via the Internet: a systematic review of applications, clinical efficacy and cost-effectiveness. *Expert Rev Pharmacoecon Outcomes Res*, 12, 745-764 (2012).

• **Comprehensive review of ICBT studies.**

28. Spek V, Nyklicek I, Smits N *et al.* Internet-based cognitive behavioural therapy for subthreshold depression in people over 50 years old: a randomized controlled clinical trial. *Psychol Med*, 37, 1797-1806 (2007).
29. Cuijpers P, Munoz RF, Clarke GN, Lewinsohn PM. Psychoeducational treatment and prevention of depression: the "Coping with Depression" course thirty years later. *Clin Psychol Rev*, 29, 449-458 (2009).
30. Spek V, Cuijpers P, Nyklicek I *et al.* One-year follow-up results of a randomized controlled clinical trial on internet-based cognitive behavioural therapy for subthreshold depression in people over 50 years. *Psychological Medicine*, 38, 635-639 (2008).

31. Wagner B, Horn AB, Maercker A. Internet-based versus face-to-face cognitive-behavioral intervention for depression: A randomized controlled non-inferiority trial. *J Affect Disord*, 152-154, 113-121 (2014).
32. Lappalainen P, Granlund A, Siltanen S *et al.* ACT Internet-based vs face-to-face? A randomized controlled trial of two ways to deliver Acceptance and Commitment Therapy for depressive symptoms: An 18-month follow-up. *Behaviour Research and Therapy*, 61, 43-54 (2014).
33. Ly KH, Topooco N, Cederlund H *et al.* Smartphone-supported versus full behavioural activation for depression: a randomised controlled trial. *PLoS One*, 10, e0126559 (2015).
34. Beck AT, Steer RA, Brown GK. *Manual for the Beck Depression Inventory-II* (Psychological Corporation, San Antonio, TX, 1996).
35. Rozental A, Andersson G, Boettcher J *et al.* Consensus statement on defining and measuring negative effects of Internet interventions. *Internet Interventions*, 1, 12-19 (2014).

• **Consensus statement regarding the reporting of negative effects of internet interventions.**

36. Choi I, Zou J, Titov N *et al.* Culturally attuned Internet treatment for depression amongst Chinese Australians: a randomised controlled trial. *J Affect Disord*, 136, 459-468 (2012).
37. Cuijpers P, van Straten A, Schuurmans J, van Oppen P, Hollon SD, Andersson G. Psychotherapy for chronic major depression and dysthymia: A meta-analysis. *Clin Psychol Rev*, 30, 51-62 (2010).

38. Smith DJ, Griffiths E, Poole R *et al.* Beating Bipolar: exploratory trial of a novel Internet-based psychoeducational treatment for bipolar disorder. *Bipolar Disord*, 13, 571-577 (2011).
39. van der Zanden R, Kramer J, Gerrits R, Cuijpers P. Effectiveness of an online group course for depression in adolescents and young adults: a randomized trial. *J Med Internet Res*, 14, e86 (2012).
40. Titov N, Dear BF, Ali S *et al.* Clinical and cost-effectiveness of therapist-guided internet-delivered cognitive behavior therapy for older adults with symptoms of depression: a randomized controlled trial. *Behav Ther*, 46, 193-205 (2015).
41. Harvey AG, Lee J, Williams J *et al.* Improving outcome of psychosocial treatments by enhancing memory and learning. *Perspectives on Psychological Science*, 9, 161-179 (2014).
42. Andersson G, Carlbring P, Berger T, Almlöv J, Cuijpers P. What makes Internet therapy work? *Cogn Behav Ther*, 38(S1), 55-60 (2009).

Table 1. Contrasting face-to-face cognitive behavior therapy (CBT) against internet-delivered guided cognitive behavior therapy (ICBT).

	CBT	ICBT
1. Pre-treatment assessment	Paper and pencil questionnaires completed in session or between sessions.	Structured telephone interview following questionnaire assessment via the internet in a secure web-platform.
2. Treatment delivery	Scheduled sessions at a clinic. Mainly verbal but sometimes complemented with text-material.	Via text, video and audio in a secure web-platform. Access from where the patients are. Scheduling and travel not needed.
3. Access to the treatment after a session	Rarely possible with the exception of audio-recorded sessions handed out to patients as homework.	Always possible for patients to go back to the treatment modules including previous reading correspondence with therapist.
4. Therapist role	Explaining treatment rationale, checking homework, doing in-session activities, to secure a therapeutic alliance. Therapist training and competence probably crucial.	Therapist role is mainly supportive and based on text. Occasional need to clarify the treatment material. Therapist skills and training probably less crucial, with the exception of writing skills.

5. Outcome monitoring	Time-consuming as part of sessions.	Embedded in many ICBT solutions as part of treatment.  Psychometric properties equal or better in comparison with paper-and-pencil format.
6. Security and ethical issues	Regulated by ethical standards and codes of conduct.	Data security important.  Ethical standards not well developed and differ between countries. Back-up and referral needed for emergency cases.

ACCEPTED MANUSCRIPT