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Invited Essay

Using the Internet to provide cognitive behaviour therapy

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ABSTRACT

A new treatment form has emerged that merges cognitive behaviour therapy with the Internet. By delivering treatment components, mainly in the form of texts presented via web pages, and provide ongoing support using e-mail promising outcomes can be achieved. The literature on this novel form of treatment has grown rapidly over recent years with several controlled trials in the field of anxiety disorders, mood disorders and behavioural medicine. For some of the conditions for which Internet-delivered CBT has been tested, independent replications have shown large effect sizes, for example in the treatment of social anxiety disorder. In some studies, Internet-delivered treatment can achieve similar outcomes as in face-to-face CBT, but the literature thus far is restricted mainly to efficacy trials. This article provides a brief summary of the evidence, comments on the role of the therapist and for which patient and therapist this is suitable. Areas of future research and exploration are identified.

Introduction

Defining Internet-delivered interventions can be problematic as there are different conceptualisations and viewpoints. A first distinction relates to the Internet itself, as it can be a way to communicate with a physical person on the other side of the connection (e.g., e-mail), a way to present information in a more or less one way direction (information web pages), or a platform for more interactive programs which do not require any input from a clinician. Finally, Internet interventions can be a little bit of all this. In some ways this resembles the problems when trying to define psychotherapy, even within cognitive behaviour therapy (CBT), as we are dealing with different techniques and delivery approaches. All of these may have an impact on the manner in which the therapy works. For example, the differences between individual and group CBT can be substantial, and different change processes could be involved (Morrison, 2001). In our research program in Sweden we have developed an approach to Internet-delivered CBT which is distinct in the sense that it involves therapist contact, albeit minimised, and that it is not heavily computerised in terms of interactive programmes requiring no therapist input. According to Marks, Cavanagh, and Gega (2007), computerised interventions should delegate at least some therapy decisions to the computer, but in the approach I will present in this paper this is not necessarily the case as the Internet very well can be used without any automatic, computer generated decision making. When describing our approach Marks et al. referred to the Swedish model as "Net-bibliosystem CBT", but that does not fully catch the essence of the approach. In a paper by our group we instead proposed the following definition of guided Internet-delivered treatment:

> … a therapy that is based on self-help books, guided by an identified therapist which gives feedback and answers to questions, with a scheduling that mirrors face-to-face treatment, and which also can include interactive online features such as queries to obtain passwords in order to get access to treatment modules (Andersson, Bergström et al., 2008 p. 164)

As seen from this definition we used the term self-help, which may cause some confusion. In research it is often the case that self-help refers to treatments that are delivered with minimal input from a clinician (Watkins & Clum, 2008). That approach is different from purely self-administered self-help. Guided Internet-delivered treatment is an approach which combines the advantages of structured self-help materials, presented in an accessible fashion via the Internet, with the important role played by an identified therapist who provide support, encouragement and occasionally direct therapeutic activities via e-mail (Postel, de Haan, & De Jong, 2008). As will be seen in this review there are strong reasons to assume that it is premature to leave out the therapist when moving to the new format of Internet-delivered CBT. For example, if Internet delivery is regarded as mainly one way to decrease therapist time, this follows a long-standing tradition in CBT when

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treatments are shortened without compromising the efficacy (e.g., Clark et al., 1999; Öst, 1997).

The present review will describe and comment on how CBT has the potential to reach more people by using the Internet. The focus will not be to describe all studies that have now been conducted (see Barak, Hen, Boniel-Nissim, & Shapira, 2008), but rather to give examples of trials and consider questions regarding therapist factors and dissemination issues. Indeed, systematic reviews of the literature on Internet-delivered CBT show that moderate to strong effects are observed at posttreatment (e.g., Cuijpers, van Straten, & Andersson, 2008a; Spek, Cuijpers et al., 2007).

Anxiety disorders

Among the first conditions to be systematically studied in self-help research and later on in research on Internet-delivered CBT are the anxiety disorders. Many people never seek help or do it after years of suffering (Clark, 1999).

Panic disorder

More or less simultaneously, two independent research groups began to investigate if CBT for panic disorder could be delivered via the Internet. Typically, treatment consists of text materials like in bibliotherapy, but presented via the Internet and with some interactive features. Treatment is supported by a therapist with e-mail or telephone and duration of treatment is often up to 10 weeks. A few smaller trials by the Australian research group showed promising outcomes (Klein & Richards, 2001; Richards & Alvarenga, 2002). Later research by the same group, but with larger samples and improved programs confirmed the early findings (Klein, Richards & Austin, 2006; Richards, Klein, & Austin, 2006), and also extended the application by including other providers of treatment (Shandley et al., 2008). In a recent trial they compared Internet-delivered and face-to-face treatment and found equivalent outcomes (Kiropoulos et al., 2008). In this latter study, participants with a primary diagnosis of panic disorder were randomly assigned to either guided Internet-delivered CBT or to best practice face-to-face CBT. In other words this was an equivalence trial (Piaggio, Elbourne, Altman, Pocock, & Evans, 2006), as the authors expected and powered their study assuming equal outcome. The authors found that 30.4% (14/46) of their panic online treatment participants reached the criteria of high end-state functioning, with the corresponding figure in the face-to-face group being 27.5% (11/40). High end-state was defined as being free of panic and having a panic disorder clinician severity rating of less than 2 (on a 0–8 scale).

Our Swedish group has independently conducted similar research with three controlled trials all showing positive outcomes (Carlbring, Westling, Ljungstrand, Ekselius, & Andersson, 2001, Carlbring, Ekselius, & Andersson 2003; Carlbring et al., 2006), and a direct comparison between face-to-face and Internet-delivered CBT (Carlbring et al., 2005). In the Carlbring et al. (2003) study two active online treatments were compared (CBT versus applied relaxation), showing small differences in outcome. While this could be viewed as an argument for placebo effects in online CBT, we hesitated to draw that conclusion as applied relaxation following the protocol of Öst (1987) has been found to generate good outcome in Swedish panic trials (e.g., Öst & Westling, 1995). In terms of effect sizes we have generally found high standardised effect sizes, both for primary panic-related outcomes and secondary outcomes. For example, in the trial in which we added brief weekly supportive telephone calls (Carlbring et al., 2006), the mean between group effect size across all measures was $d = 1.00$, and outcomes were sustained at 9-month follow-up.

A third research group has independently tested Internet-delivered CBT for panic disorder, again showing that the treatment concept appears to hold (Schneider, Mataix-Cols, Marks, & Bachofen, 2005). The trial by that group differs in many respects from the trials conducted by the Australian and Swedish research groups, as in the outcome measures used. Overall, however the three independent replications by different research groups all point in a similar direction. A problem is that most trials have been small and there are few effectiveness studies showing that the treatment works in regular health care settings. A recent exception was an open uncontrolled Swedish trial in which we found that the results from the efficacy trials were replicated in a psychiatric setting (Bergström et al., 2009).

With all these trials we still need to be cautious as policy makers and some clinicians immediately infer that Internet delivery is close to free once the costs for programming have been covered. This is not the case. For example, the role of support was indirectly showed by Farvolden et al. (2005) who had a poor outcome and a huge dropout rate when no guidance was provided and the Internet program was made freely available.

Social anxiety disorder

Our research group inevitably came across social anxiety disorder (SAD)/social phobia in our research on panic as we had to exclude people who did not fulfil the criteria for panic disorder and mainly had their panic attacks in social situations. At the outset we first believed that it could not be enough to use a mainly text-based treatment (albeit with instructions on how self-exposure should be conducted), and hence we added two live group exposure sessions in our first study (Andersson, Carlbring et al., 2006). In the following trial we omitted the live exposures (Carlbring et al., 2007), which did not affect the outcome. Further trials from our group corroborate these preliminary findings (e.g., Tillfors et al., 2008), and between group effect sizes against no treatment controls ranging between $d = .73$ to $d = .98$ for the Liebowitz Social Anxiety Scale self-report version (Baker, Heinrichs, Kim, & Hofmann, 2002) have been reported. Two other research groups have found similar effects. Titov and coworkers in Australia reported two trials (Titov, Andrews, Schwencke, Drobny, & Einstein, 2008; Titov, Andrews, & Schwencke, 2008), with between group effect sizes above $d = .80$. Berger, Hohl, and Caspar (2008) in Switzerland have replicated the findings as well, with the common elements being a structured CBT program and guidance via Internet.

It is not obvious that Internet-delivered CBT should work for patients with SAD. It could be argued that we instead reinforce their avoidance of contact with people. Indeed it has been found that persons with severe social anxiety disorder do use the Internet extensively (Erwina, Turk, Heimberg, Frescoa, & Hantula, 2004). On the other hand, the "safe" environment in front of the computer might facilitate the necessary learning phase in CBT, in which the principles of treatment are described (e.g., rationale). Exposure and modification of behaviours such as safety behaviours in real life will however be needed, and are parts of the effective programs. Our experience so far is that many persons with social anxiety manage to go out and seek exposure with the guidance of a self-help programme and an online support person.

Post-traumatic stress disorder

Post-traumatic stress disorder (PTSD) is a debilitating condition with marked symptoms of avoidance and intrusions that can have a significant negative impact on the quality of life (Keane & Barlow, 2002). As with other anxiety disorders shame is often involved and hence, the prospect of receiving treatment from

a distance can appear appealing. At least four different research groups have developed Internet treatments for symptoms of PTSD. First were a Dutch group who developed their own approach called "Interapy" (Lange, van de Ven, & Schrieken, 2003). This protocol has been tested in RCTs (e.g., Lange, Rietdijk et al., 2003), and includes many ingredients involving structured writing assignments in line with the work by Pennebaker (1993). Another research group conducted a small controlled study on an Internet-based self-help program with some therapist support (Hirai & Clum, 2005). Improvements were observed with above half of the treated participants showing clinically significant improvement. A third research group has completed a series of studies on trauma and grief, focusing on the working alliance, and found high patient ratings of therapeutic alliance in Internet treatment, as well as improvements on symptoms measures (e.g., Knaevelsrud & Maercker, 2007). This group used the same program as the Lange group (Lange, Rietdijk et al., 2003), and replicated their findings. Independently, a fourth group have developed and tested an Internet-based CBT treatment for PTSD (Litz, Engel, Bryant, & Papa, 2007). In their controlled trial they had an active control group, which is uncommon in this research field. The authors reported a between group effect size of $d = 0.95$ for their overall measure of PTSD symptoms, when considering treatment completers at 6-month follow-up. Using intent-to-treat analyses they reported that a significantly greater percentage of cases in the CBT group no longer met criteria for PTSD at the 6-month follow-up. With most studies on PTSD pointing in the same direction, and with independent research groups replicating the findings, it is important to further test and develop Internet-based treatment of PTSD.

Mood disorders

Depression represents one of the major challenges for maintenance of public health (Ebmeier, Donaghey, & Steele, 2006). At least in a mild to moderate form, depression tends to respond well to most forms of psychotherapy (Cuijpers, van Straten, Andersson, & van Oppen, 2008b). This includes self-help interventions (Cuijpers, 1997), and several trials on Internet-delivered CBT have been conducted by different research groups (Andersson, 2006). Our own experience in using a guided Internet-delivered program in three controlled trials has been positive. In the published trial we found a high between group effect size ($d = 0.90$) for the main outcome measure (Andersson, Bergström et al., 2005). Equally promising outcomes have been reported in the Netherlands (Spek, Nyklicek, et al. 2007). Other groups have found somewhat lower effects (Christensen, Griffiths, & Jorm,2004), and even lower effects and large dropout rates when no support is provided (Christensen, Griffiths, Mackinnon, & Brittliffe, 2006), but the public health perspective can still make these low cost alternatives suitable as early interventions in a stepped-care process. Another group has also confirmed that Internet-delivered treatment can work but that some kind of guidance might be needed when targeting depressive symptoms (Clarke et al., 2002, 2005). It remains to be seen if depression is particularly sensitive to the need for a therapist, with at least a few unguided programs showing very weak or non-existent benefits (e.g., Patten, 2003). It is important to know that most studies in the field of mood disorders and Internet treatment have not dealt with diagnosed cases of major depression (e.g., O'Kearney, Gibson, Christensen, & Griffiths, 2006), but rather people with depressive symptoms (Andersson & Cuijpers, 2008). The literature on Internet-based treatment of major depression and depressive symptoms is scattered with several research groups being active. For example, some researchers focus more on prevention and early intervention (Van Voorhees et al., 2007). Overall, the evidence is promising and future studies could target well diagnosed patients as well as maintenance of treatment gains.

Other health problems

There are several other conditions for which guided Internet-delivered CBT has been tested (Cuijpers et al., 2008a). In our research group we have conducted controlled trials on tinnitus (Kaldo et al., 2008), headache (Andersson, Lundström, & Ström, 2003), insomnia (Ström, Pettersson, & Andersson, 2004), and chronic pain (Buhrman, Fältenhag, Ström, & Andersson, 2004). Other targets of Internet-based intervention have included pathological gambling (Carlbring & Smit, 2008), eating disorders (Ljótsson et al., 2007), obesity (Tate, Wing, & Winett, 2001), and stress management (Zetterqvist, Maanmies, Ström, & Andersson, 2003). Given the number of completed and ongoing trials from different research groups around the world it is safe to conclude that Internet-delivered CBT is here to stay. What is less clear is the format of therapy. For example, the Internet can be used as an adjunct to existing treatments (Spence, Holmes, March, & Lipp, 2006), and online assessment procedures are increasingly used in research and clinic (Andersson, Ritterband, & Carlbring, 2008). It is now fairly established that psychometric properties of self-report measures tend to transfer well when the same questionnaires are administered via the Internet, but that each instrument needs to be validated for online use (Buchanan, 2003). A likely development in the near future is that we will see more use of the Internet in regular clinical practice.

The Internet and the therapist

Emerging evidence across trials clearly suggests that the computer cannot totally replace human contact, even if it can be minimised. In fact, we found a correlation of rho = 0.75 ($p < 0.005$) between the amount of therapist contact in minutes and the between group effect size in 15 trials dealing with psychiatric conditions (Palmqvist, Carlbring, & Andersson, 2007). It is possible that there is a cut-off point below which smaller effects and more dropouts are seen. Indeed, this is especially clear in online depression treatments as little or no therapist contact either via live meetings, telephone calls or e-mails tend to increase dropout and reduce effects markedly (Christensen et al., 2006). Spek, Cujpers et al. (2007) found similar effects of human support in their meta-analysis.

A common question is whether Internet treatment can generate a positive working alliance (Cook & Doyle, 2002). Overall, Internet-based treatments tend to generate a strong therapeutic alliance (Knaevelsrud & Maercker, 2007), while not being strongly associated with outcome. Some indications of a weaker alliance in Internet treatments as compared with live CBT have been noted, albeit not statistically significant (Klein et al., 2006).

Yet another way to investigate if the therapist is important is to analyse the variance in treatment outcome attributed to the therapist. Using data from three controlled trials on panic disorder, social phobia and generalised anxiety disorder (total $N = 119$), with respect to the individual therapists ($N = 8$) who gave support during the treatment period, we have found very small therapist effects (Almlöv et al., 2008). This does not rule out the importance of expertise. First, in many of our Swedish trials we have had students under supervision as therapists, and it is possible that they improvise less or adhere more to the protocol as they have little clinical experience to rely on. Second, the self-help texts used in the treatments can also reflect clinical experience and empathy, and as the text material is the same for all trial participants it is rather the interaction with the therapist and the text that is relevant to

consider. For example, if a therapist does not fully understand the text material, perhaps not having a robust knowledge of CBT, it is likely that difference in between skilled versus less skilled therapists will be more noticeable.

In sum, there are clear indications that the presence of an online therapist guiding the patients and providing feedback is important for adherence and outcome. A therapeutic alliance can also develop in online treatments, but thus far we cannot say that it matters much who the therapist is.

For whom is Internet-based treatment suitable?

Some obvious limitations relate to comprehension of text materials and computer expertise. In many studies, patients who lack these characteristics are excluded. It does not have to be this way however, as multimedia presentations (e.g., video and audio files online), and simplified language can be used to handle these obstacles. Another limitation relates to comorbidity and the mere fact that an evidence-based treatment, with its research base coming from standard individual therapy, does not necessarily lends itself to the self-help format. On the other hand comorbidity is not always an obstacle in CBT (e.g., Ramnerö & Öst, 2004), and in the few studies available on Internet-delivered CBT few consistent predictors have been identified. In a depression trial we found a negative correlation between change scores on the main depression outcome measure and number of previous depression episodes (Andersson, Bergström, Holländare, Ekselius, & Carlbring, 2004).

It is also possible that differential predictors of live versus face-to-face treatment outcomes exist. For example, agoraphobic avoidance was predictive of outcome in the face-to-face treatment, but not in the Internet treatment (Andersson, Carlbring, & Grimlund, 2008). A self-report screening of personality disorder (anxious cluster) was associated with the worse outcome for the Internet treatment, but surprisingly associated with better outcome in face-to-face treatment. Cognitive capacity as measured by a test of verbal fluency was not predictive of outcome in the Internet group, and neither was a rating of treatment credibility. Spek, Nyklicek, Cuijpers, and Pop (2008) investigated predictors of outcome of group versus Internet-based CBT for depression. They found that higher baseline depression scores, female gender, and low neuroticism predicted better outcome for both groups, but altruism (as a personality factor) was only related to outcome in the live group treatment. It is yet premature to draw any conclusions regarding different predictors, and even less so regarding the neglected issue of moderators and mediators of outcome in Internet-delivered CBT. Mediators might include understanding the written material in the programs, adherence to the homework conducted, but could also involve other aspects relating more directly to online behaviours (such as how the website is accessed).

Treatment credibility is another topic that has been investigated in some trials. For example in one panic trial we compared credibility ratings between live versus Internet CBT (Carlbring et al., 2005). Credibility ratings were significantly higher in the face-to-face treatment condition versus the Internet conditions. A similar observation was made in a tinnitus trial comparing Internet versus live group treatment (Kaldo et al., 2008). In terms of prediction we have found treatment credibility to be predictive of outcome of Internet-delivered CBT in some studies (e.g., Carlbring et al., 2006), but not in others (e.g., Carlbring et al., 2001).

Therapists' attitudes towards Internet treatment are important. Wangberg, Gammon, and Spitznogle (2007) did a survey on psychologists in Norway and found that most were rather neutral regarding the use of the Internet, and a few were very negative. Moreover, they found that a CBT orientation was associated with a more positive attitude towards using the Internet than having a psychodynamic orientation. A similar result was obtained by Mora, Nevid, and Chaplin (2008), with CBT practitioners being more positive than psychoanalytically oriented practitioners.

In sum, we have limited knowledge on predictors of outcome making it hard to state for whom Internet treatment is unsuitable. Treatment credibility tends to slightly lower than for face-to-face treatments, and many practitioners of therapy still hesitate to endorse Internet-based treatments. CBT clinicians however tend to be more positive.

Future challenges

It is not difficult to identify future challenges regarding Internet-delivered CBT. Methodological problems are one. High attrition in some studies is one example. Lack of proper diagnoses in many trials is another. It is also difficult to grasp the content of the self-help materials used, and the content of treatment programs and compliance with the treatment could be described better. Another issue has to do with costs of developing and implementing the interventions, for example describing the amount of time spent with each client during the treatment.

A second challenge has to do with dissemination and effectiveness research. While CBT now increasingly has been found to work in regular clinical settings (Hunsley & Lee, 2007), there are only a few Internet studies in which the treatment has been implemented in clinical settings. Some are not really full CBT treatment programs but should rather be seen "information", potentially acting as an early step in a stepped-care process. These programs might very well be feasible from a public health point of view (Andersson & Cuijpers, 2008). Program such as the "blue pages" necessitates little if any clinician input (Christensen et al., 2004), and a large group of people can be given access to the information content. While clinician input is minimised in the effective programs, it is still there. From the patient perspective it is just as time consuming and demanding as live CBT. The main advantage lies in overcoming distances as clients can get treatment even if they live far away provided that they have Internet access.

Different treatment formats can be combined. We have tested combined treatments (e.g., live exposure and Internet treatment) in some studies. It is possible that future clinicians will stay in touch with their clients via the Internet (or in some other manner such as mobile phones) while still having treatment sessions in the clinic. A potential use of the Internet could be as a tool in relapse prevention, following an intervention in the clinic. Online maintenance programs and check-ups could then be used. In fact, most likely the Internet will be used in some way in more or less all future treatments. Homework assignments could be handled via secure webpages. This would be feasible in intensive treatments (for example with obsessive-compulsive disorder when daily exposure and response prevention is called for). New technology should not be automatically seen as a replacement, but rather as a complement to existing treatment protocols.

Finally, a fourth challenge is to take advantage of the treatment format. We have recently begun to test tailored treatments using modified versions of treatment modules from different programs. For example, a person with anxiety might fulfil the criteria for one anxiety diagnosis and partly for other diagnoses. In fact, comorbidity across the anxiety and mood disorders is more common than not (Barlow, 2002). This person could be given a tailored program. This kind of tailored program could consist of psychoeducation, cognitive restructuring, exposure to both interoceptive (from the panic program) and social (from the social phobia program) stimuli.

In conclusion, we are only seeing the beginning of Internet-delivered CBT. It might even be a paradigm shift as CBT clinicians

are increasingly using text materials in their treatments (Keeley, Williams, & Shapiro, 2002), and the Internet can be used not only to present text but also films, and audio files, structured self-assessments, discussion groups, and many other functions. We are now in a position that we can safely conclude that Internet-delivered CBT tends to work for a range of problems for at least some of our patients. Given the lack of trained CBT practitioners and low uptake of evidence-based treatments (Lovell & Richards, 2000), it would be inappropriate not to use Internet treatment at least as a complement to our other treatments.

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