The efficacy and effectiveness of online CBT
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In 1997, researchers at the University of Amsterdam developed one of the first psychotherapeutic applications of the World Wide Web. They implemented a standardized cognitive behavioural treatment (CBT) of posttraumatic stress symptoms in a website, and used this site to treat a small number of students with matching symptoms. To the surprise of the research team, the results of what they called Interapy were very encouraging. Despite the lack of face-to-face contact, symptoms of 19 of the 20 students had been reduced to normal levels after treatment (Lange, van de Ven, Schrieken, Bredeweg, & Emmelkamp, 2000). Subsequently, controlled trials confirmed the value of this pilot study, and showed that a large part of these improvements could be attributed to the intervention. In this dissertation, we explore the wider applicability of online CBT, in four randomized controlled trials (Chapter 2 to 5) and a practice study (Chapter 6). In the controlled studies (N = 456), we assess the efficacy of online CBT for work-related stress, mild to moderate depression, and symptoms of panic disorder and bulimia nervosa. In the fifth study, we examine the effectiveness of online CBT in routine clinical practice (N = 1500).

1.1 Online CBT

While effective treatments exist for most common mental health disorders (Roth & Fonagy, 2005), evidence suggests that only a minority of those affected are reached (World Health Organization, 2001; Lancet Global Mental Health Group, 2007). Patients do not seek help, are unable to access it, or receive treatment that does not correspond to current practice guidelines (Shafran et al., 2009). The barriers are
psychological, social, geographical, and systemic (Collins, Westra, Dozois, & Burns, 2004). Internet applications have reduced or removed such barriers in many areas of life. Psychotherapeutic internet interventions may support public mental healthcare in a similar vein (F. Griffiths, Lindenmeyer, Powell, Lowe, & Thorogood, 2006; Emmelkamp, 2005).

In the past decade, researchers have developed psychotherapeutic internet interventions for a wide variety of mental health disorders (Barak, Hen, Boniel-Nissim, & Shapira, 2008). These interventions vary in terms of the intended purpose (prevention, early intervention, treatment, aftercare), the electronic means that are used to deliver the intervention (e-mail, e-chat, websites, video-conferencing, mobile applications), and in the level of professional support. In terms of the psychotherapeutic orientation, available interventions are surprisingly homogeneous: the vast majority of existing internet interventions are based on Cognitive Behavioural Therapy (CBT).

CBT is characterized by clear-cut therapeutic procedures, which are relatively easy to translate into an online format. In addition, there is general agreement on the effectiveness of CBT (Butler, Chapman, Forman, & Beck, 2006). Meta-analyses suggest that this effectiveness generalizes to internet interventions, although it should be noted that these meta-analyses also reveal significant heterogeneity in study outcomes (Cuijpers et al., 2009; Andersson & Cuijpers, 2009). There is growing consensus that professional guidance is a critical determinant of the efficacy of online CBT (Palmqvist, Carlbring, & Andersson, 2007; Spek et al., 2007).

1.1.1 Three types of online CBT

Self-help. Online self-help interventions do not include guidance from a mental health professional. Such interventions allow large-scale, low-cost dissemination of CBT. Online self-help appears to be effective for a variety of psychological symptoms, although its effects are statistically small and drop-out rates are very high (Kaltenthaler et al., 2006; Foroushani, Schneider, & Assareh, 2011; Spek et al., 2007; Andersson & Cuijpers, 2009). Even so, online self-help interventions are currently implemented in routine practice for preventive purposes, based on the assumption that interventions with small effects may have a noticeable impact if available to a large part of the population.
**Guided self-help.** Most internet interventions offer a mix of self-help and human guidance. In guided self-help, mental health professionals support clients in the use of the self-help material, through e-mail, e-chat, telephone support, or face-to-face sessions. This support is intended to be limited to approximately 60-90 minutes per treatment (e.g., Titov et al., 2010). The interventions are therefore alternatively labelled as ‘low-intensity CBT’ (Bennett-Levy et al., 2010). In comparison to online self-help, guided self-help is more expensive and less accessible. However, the professional support substantially increases the efficacy of, and adherence to, an intervention (Cuijpers et al., 2009; Andersson & Cuijpers, 2009; Spek et al., 2007).

**Psychotherapy.** Online psychotherapy is an extension of online guided self-help. Like guided self-help, online psychotherapy promotes self-efficacy through a combination of homework assignments and psycho-education. However, the role of the therapist is not limited to providing support or help if the client gets stuck. The online psychotherapist has the same role as the regular face-to-face CBT therapist (Barak, Klein, & Proudfoot, 2009): to explain each step of treatment, to give tailored feedback to the client feedback after each step, and to introduce the next step. Online treatment may be highly manualized, and thus provides therapists with specific guidelines and help in treating patients.

### 1.2 Interapy

The Interapy research program, which we introduced in the beginning of this chapter, represents one of the few systematic attempts to deliver full online psychotherapy, i.e., online CBT with extended therapist support that does not require any face-to-face contact between the client and a mental health professional.

#### 1.2.1 General characteristics

In Interapy, clients and therapists work on treatment in convenient locations with internet access, including the home. The therapeutic procedure is delivered completely through a secure website. Clients are assessed in an elaborate online screening procedure, in which standardized and validated self-report questionnaires query back-
ground data, symptom severity and contra-indications for online treatment. During the treatment, clients and therapists interact through an asynchronous exchange of text messages via web-based e-mail. Their dialogue is governed by a highly detailed treatment manual, which defines a fixed sequence of homework assignments that implement common cognitive-behavioural therapeutic techniques. Therapist support consists of standardized, default feedback and instructions that are tailored by the therapists to the specific situation and specific alliance of the client. In this feedback, motivational techniques are applied to enhance the impact of the intervention, i.e., to ensure clients understand the purpose of the homework, set realistic goals, do their exercises as prescribed, and continue the treatment (Lange, 2006, chapter 3; van der Velden, Hoogduin, & Lange, 2010). These motivational techniques, which are seen as the 'common factors' of psychotherapy (Messer & Wampold, 2002), target clients' motivation for change, the therapeutic alliance (e.g., by expressing empathy and understanding), and self-esteem and self-efficacy (e.g., by complimenting the clients on their progress and accomplishments, instead of confronting them when their homework is insufficient).

Figure 1.1: Screenshot of the Interapy treatment website.
1.2.2 Interapy for posttraumatic stress

The general principles of Interapy were developed from research into the treatment of posttraumatic stress (Lange, Van de Ven, Schrieken, & Schoutrop, 2002). Interapy addresses symptoms of posttraumatic stress through five weeks of online CBT, in which clients receive psycho-education, structured writing exercises, and regular instructions and feedback from a personal therapist. The treatment comprises three phases, which incorporate imag衬ory exposure (phase I), cognitive reappraisal (phase II) and social sharing (phase III).

Interapy for posttraumatic stress was first tested in 1997, in the seminal pilot study by Alfred Lange and colleagues mentioned above (Lange, van de Ven, et al., 2000). Since results of this pilot were almost too good to be true, the researchers checked for errors in their data and their analyses. As these checks revealed no errors, the online intervention was judged to be surprisingly effective.

To determine the controlled effects of the online treatment, the Interapy research group conducted two randomized waiting-list controlled trials (Lange, van de Ven, Schrieken, & Emmelkamp, 2001; Lange, Rietdijk, et al., 2003). In both trials, online CBT was more effective in comparison to the waiting-list, with large between-group effect sizes relating to symptoms of posttraumatic stress and general psychopathology. Subsequent follow-ups showed that gains sustained up to 18 months after treatment (Lange et al., 2002; Lange, van de Ven, & Schrieken, 2003). These findings were replicated in two RCTs by an independent Swiss/German research group (Knaevelsrud & Maercker, 2007, 2009; Wagner, Knaevelsrud, & Maercker, 2006; Wagner & Maercker, 2007). Recent trials indicate that the treatment can be successfully used to reach out to adolescent victims of sexual abuse (Lange et al., 2011), and to victims of war and human rights violations in remote conflict areas such as Iraq (Wagner, Schulz, & Knaevelsrud, 2012).
1.3 This dissertation

1.3.1 Research aims

The research aims of this dissertation were two-fold:

1. To assess the efficacy of online cognitive behavioural treatment for common mental health disorders other than posttraumatic stress.

Given the positive effects of Interapy for posttraumatic stress, we had good reasons to think that online CBT would provide an effective treatment for other mental health disorders. Evidence indicated that computer-mediated therapy allowed for an effective therapeutic relationship, and that evidence-based therapeutic procedures could be delivered online. But there were, of course, no guarantees that Interapy would be equally efficacious in the management of disorders that are different from posttraumatic stress. Hence, we developed new protocols for the online treatment of four common mental health disorders on the basis of the general principles on which Interapy for posttraumatic stress was based, and checked the efficacy of these protocols in a series of randomized controlled trials.

2. To assess the effectiveness of online cognitive behavioural treatment in routine clinical practice.

Favourable results in clinical trials do not necessarily imply favourable results in routine clinical practice. RCTs provide information about the efficacy of a treatment, i.e., the capacity of a treatment to produce an effect under ideal conditions. But efficacy should not be confused with effectiveness, which refers to the capacity of the treatment to produce positive effects under routine practice conditions (Andersson, Carlbring, & Cuijpers, 2009; Nathan, Stuart, & Dolan, 2000; Seligman, 1995). Findings suggest that effects are generally better under controlled conditions, i.e., that efficacy > effectiveness (Westbrook & Kirk, 2005). It was therefore important to check the degree to which the efficacy of online CBT, as determined in the controlled trials, would translate to treatment effectiveness in the routine clinical practice setting.
1.3. This dissertation

1.3.2 Outline

The dissertation comprises five studies. Chapters 2 to 5 describe four randomized controlled trials of online CBT for symptoms of work-related stress, depression, panic disorder, and bulimia nervosa. Chapter 6 presents the effects of online CBT in routine clinical practice.

**Online CBT for work-related stress.** Chapter 2 describes the controlled evaluation of online CBT for work-related stress. We developed this program in 2001. At that time, work-related stress had been identified by the European Union (EU) as the second most common work-related health problem, affecting an estimated 28% of EU workers (possibly a greater percentage in the Netherlands; Schaufeli & Kompier, 2001), accounting for a quarter of long-term absences from work, and amounting to a staggering 20 billion euros of annual costs to EU member states (Paoli & Merllie, 2001). A meta-analysis had identified individual-focused CBT as an effective intervention for work-related stress (van der Klink, Blonk, Schene, & van Dijk, 2001). Based on these findings, we developed a treatment protocol with which employees could be trained, over the internet, to apply new coping skills and stress reduction techniques in their work-environment.

**Online CBT for depression.** Chapter 3 presents the randomized trial of online CBT for depression, which we started in 2003. Colleagues in Australia and the UK had reported some success with online and computer-supported self-help in the treatment of depressive symptoms (Christensen, Griffiths, & Korten, 2002; Christensen, Griffiths, & Jorm, 2004; Proudfoot et al., 2003, 2004), but these positive results were countered by the negative results of a large RCT, in which unsupported online CBT was ineffective (Clarke et al., 2002). We hypothesized that results were inconclusive because existing programs did not include therapist support. Hence, we set out to develop a web-based treatment for depressive symptoms with scheduled therapist feedback, and assessed the efficacy of this treatment in an RCT.

**Online CBT for panic disorder.** Since 2002, the Interapy research group had been experimenting with online CBT for symptoms of panic disorder and agoraphobia. This
Chapter 1. General Introduction

treatment was delivered through e-mail. Although the research suggested that this treatment was potentially effective (Jager, Emmelkamp, & Lange, 2004), many clients dropped out (Jager, Emmelkamp, & Lange, 2005). This raised doubts whether this research should be continued. However, since drop-out appeared to be related to technical difficulties only, and since reports of online treatments for panic disorder were generally positive (Carlbring, Westling, Ljungstrand, Ekselius, & Andersson, 2001; Carlbring, Ekselius, & Andersson, 2003; Carlbring et al., 2005; Klein & Richards, 2001; Klein, Richards, & Austin, 2006; Marks, Kenwright, McDonough, Whittaker, & Mataix-Cols, 2004), we decided to redesign the treatment as a web-based intervention, instead of depending on e-mail communication. Chapter 4 provides a description of this treatment and of the RCT that we conducted to assess its efficacy.

Online CBT for Bulimia Nervosa. Chapter 5 describes a fourth RCT, which we started in 2007. In this study, we assessed the efficacy of online CBT for Bulimia Nervosa. Since sufferers from Bulimia Nervosa tend to hide their eating habits out of guilt and shame (Fairburn & Cooper, 1982; Fairburn & Harrison, 2003), we supposed that online CBT could provide an acceptable low-threshold treatment alternative. At that time, a number of computer-supported and online (self-help) programs for eating disorders existed, but the effects of these programs were found to be modest at best (Marks, Cavanagh, & Gega, 2007, chapter 6). In contrast, a Swedish research group found strong effects of an online guided self-help treatment for bulimic symptoms (Ljotsson et al., 2007). Encouraged by these results, we developed an Interapy program and tested this program in an RCT. In contrast to the previous RCT’s, we included three experimental comparison groups in this RCT. Participants were randomly allocated to online CBT, a waiting list, or to a pure (offline) self-help comparison group, in which participants received a self-help book. With the extra comparison group, we hoped to gain further insight in the role of therapist support.

Online CBT in routine clinical practice. In 2001, the University of Amsterdam and members of the Interapy research group founded the Interapy clinic. This was one of the first attempts to implement online mental healthcare in routine clinical practice. In 2008, the Interapy clinic had been offering online treatment for posttraumatic stress, work-related stress and depression for several years, and had just launched online
CBT for panic disorder. Outcome data, collected through routine outcome monitoring, started to provide a unique database. Although research in the field had been growing exponentially, most existing internet interventions had not been implemented in routine clinical practice. Some routine practice data had been published, but these concerned either online self-help (Christensen, Griffiths, Korten, Brittliffe, & Groves, 2004) or computer-supported therapy with face-to-face contact (e.g., Gega, Marks, & Mataix-Cols, 2004; Hayward, MacGregor, Peck, & Wilkes, 2007). While routine practice studies of therapist-assisted CBT were absent, the database of the Interapy clinic contained treatment outcome data of hundreds of clients. These data were waiting to tell how online CBT performed in routine clinical practice. Chapter 6 presents treatment outcome data of $N = 1500$ clients of the clinic.