Efficacy and effectiveness of online cognitive behavioral treatment: A decade of interapy research

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Efficacy and effectiveness of online CBT: A decade of Interapy research

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Abstract. Since 1996, researchers of the Interapy research group of the University of Amsterdam have been examining the effects of online cognitive behavioral treatment (online CBT). Over the years, the group conducted nine controlled trials of online CBT of a variety of mental health disorders, among a total of 840 participants. These studies suggest that online CBT is a viable and effective alternative to face to face treatment. Treatment adherence was 82%, and reductions in psychopathology represented a large between-group effect size of SMD = 0.9 (95% CI: .7 to 1.1), which were maintained over long periods. The research culminated in the foundation of the Interapy clinic, which received Dutch health regulatory body approval in 2005. Since then, costs of online CBT are reimbursed through public health insurance. A large study of treatment outcome of 1500 patients of the Interapy clinic showed that effects in clinical practice are similar to those observed in the controlled trials, and comparable to selected benchmarks of naturalistic studies of face to face CBT. The accumulated evidence provides compelling support for the efficacy and effectiveness of online CBT.

Introduction

In 1996, researchers of the University of Amsterdam conducted a small feasibility study of internet-based psychotherapy. Although the World Wide Web was still in its infancy at that time, they created a website through which they treated 20 students with posttraumatic stress. 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, stress symptoms of 19 of the 20 students had reduced to normal levels after treatment [1].

The 1996 study was seminal. It was followed by over a decade of research which resulted in full integration of internet-based treatment in the Dutch public health system. In this article, we briefly summarize this research from a meta-analytical perspective. We discuss the Interapy method, the efficacy of Interapy as established in a series of controlled clinical trials, and the effectiveness of Interapy as observed in routine clinical practice.

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1. What is Interapy?

Interapy is web-based, manualized, therapist-assisted cognitive behavior therapy (CBT). Screening, treatment, and outcome measurement are conducted without any face to face contact. With exception of a diagnostic telephone interview, all interaction between patients and mental health personnel is online, in a secure website. They interact through an asynchronous exchange of text-messages, i.e., the dialogue resembles an e-mail conversation rather than a video-conference or an online chat-session. This dialogue is governed by a computer system that executes the treatment manual. The manual defines a fixed sequence of homework assignments that implement common CBT interventions, which are translated into a format suitable for delivery over the Internet. Therapist support consists of standardized, default feedback and instructions that are tailored by the therapists to the specific situation of their patients. In the feedback, motivational techniques are used to enhance the impact of the interventions, i.e., to ensure patients understand the purpose of the interventions, that they set realistic goals, that they do the exercises as prescribed, and that they continue treatment. These techniques target patients' motivation for change, the therapeutic alliance (e.g., by expressing empathy and understanding), and self-esteem and self-efficacy (e.g., by complimenting the patients with their progress and accomplishments). Treatments are brief, but intensive. The duration of treatment varies from 5 to 16 weeks, in which therapists provide feedback about two times per week.

2. The Efficacy of Interapy in Controlled Clinical Trials

Over the years, Interapy has been evaluated in the online treatment of depression, posttraumatic stress, bereavement, work-related stress, panic disorder and bulimia nervosa, in nine controlled trials [2-10]. Characteristics of these trials are listed in Table 1.

2.1. Method

Trials included a total of 840 participants. Most studies were randomized controlled trials (RCT), in which participants were randomly assigned to Interapy treatment condition, or to a waiting list control condition. One study was a within-subject baseline-control study, and one study included bibliotherapy as an additional active experimental control condition. Outcome was assessed through well-validated self-report measures of primary and secondary symptom severity, such as the Beck Depression Inventory, the Impact of Event Scale, and the Depression Anxiety Stress Scales. These measures were administered at baseline, immediately after treatment (posttest), and one to three years after treatment (long-term follow-up). Outcome was analyzed in terms of mean change in symptom severity over time, and in terms of clinical significant change (i.e., reliable recovery [11]). Most trials involved conservative intention-to-treat analyses: participants, who did not complete posttreatment measurements, were assumed to have gained nothing.

Table 1. Characteristics of the Interapy efficacy trials.

Study	Symptoms	Target population	Experimental condition	N	Primary Outcome
Lange 2001	posttraumatic stress	student, Dutch	Interapy	13	IES
			waiting list	12	
Lange 2003	posttraumatic stress	community, adult, Dutch	Interapy	122	IES
			waiting list	62	
Wagner 2006	bereavement	community, adult, German	Interapy	26	IES
			waiting list	29	
Knaevelsrud 2007	posttraumatic stress	community, adult, German	Interapy	49	IES
			waiting list	47	
Ruwaard 2007	work-related stress	community, adult, Dutch	Interapy	177	DASS
			waiting list	62	
Ruwaard 2009	depression	community, adult, Dutch	Interapy	36	BDI
			waiting list	18	
Ruwaard 2010	panic symptoms	community, adult, Dutch	Interapy	27	PDSS-SR /
			waiting list	31	panic diary
Lange 2010	posttraumatic stress	Dutch, adolescent, victims of sexual abuse	baseline-control	24	IES
Ruwaard (submitted)	bulimic symptoms	community, adult, Dutch	Interapy	35	EDE-Q
			waiting list	35	
			bibliotherapy	35	

NOTE: IES: Impact of Event Scale; PDSS-SR: Panic Disorder Severity Scale, Self-rate; BDI: Beck Depression Inventory; EDE-Q: Eating Disorder Examination-Questionnaire; DASS: Depression Anxiety Stress Scales.
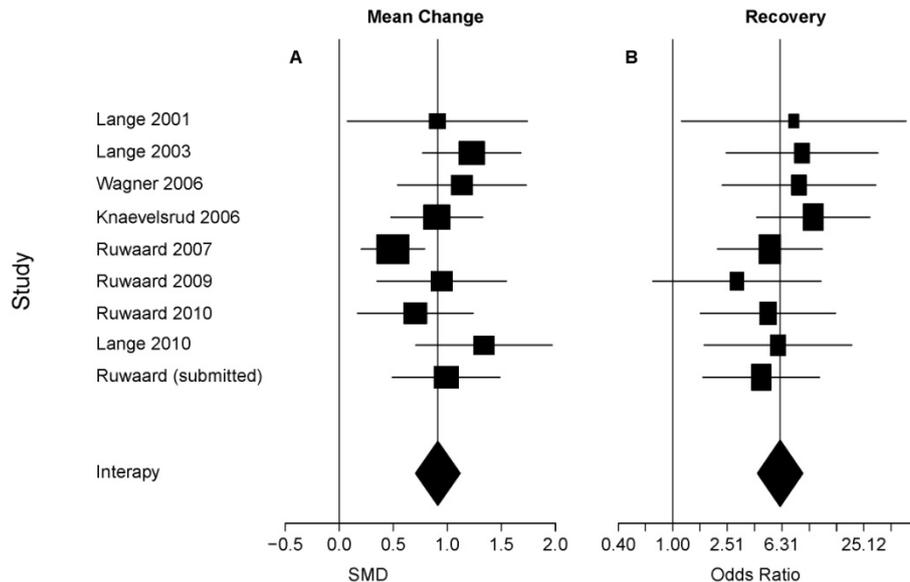

Figure 1. Forest plot of between-group effect sizes and 95% confidence intervals for the Interapy trials.

2.2. Results

Dropout rates were encouragingly low: an (unweighted) average of 82% of the patients completed every step of treatment. As illustrated by the left forest plot in Figure 1 (A), reductions in primary symptom severity were significantly larger with Interapy, in comparison to the experimental controls. The standardized mean difference (SMD) in improvement between Interapy and the experimental controls ranged from SMD = .5 to SMD = 1.3, with a pooled SMD of .9 (95% CI: .7 to 1.1). These are large effects, roughly equivalent to those of face to face CBT. Studies also revealed higher recovery rates with Interapy compared with experimental controls. Across the trials, the unweighted average recovery rate with Interapy was 60% (range: 36% to 85%) and 23% in the experimental comparison groups (range: 9% to 42%). As illustrated by Figure 1 (B), this equated to a significant, moderate-to-large odds ratio (OR) of 6.1 (95% CI: 4.2 to 9.0). One to three years after treatment, these treatment gains were found to be maintained.

3. The Effectiveness of Interapy in Routine Clinical Practice

In 2001, the Interapy research team founded the Interapy clinic, with the aim of implementing online CBT in the public health system. This clinic has been in operation since. In 2008, the team examined treatment outcome of 1500 patients of the clinic, to assess the effectiveness of online CBT during routine clinical practice.

3.1. Method

This was an uncontrolled, retrospective pretest-posttest study, with two follow-ups. Data were collected from unselected, consecutive electronic patient records of the clinic, which contained scores of self-report questionnaires that were administered at pretest, posttest, six weeks after treatment and 1 year after treatment. Patients were Dutch adults (female: 67%; age: Mean = 40; SD = 10) with a GP-referral for psychotherapy, who started treatment of depression (n = 413; 28%), posttraumatic stress (n = 478; 32%), panic disorder (n = 139; 9%) or work-related stress (n = 470; 31%). The majority of patients scored above clinical cut-off on the primary outcome measures (n = 1420, 95%; range 74%- 99% across treatments). Scores of about a quarter of the patients (24%; n = 364) indicated severe symptomatology. Most (n = 1052; 71%) did not use psychiatric medication. Primary outcome variables were treatment adherence, primary and secondary symptom severity and recovery rates.

3.2. Results

Due to routine outcome measurement, posttreatment data were available for 79% of the patients. Treatment dropout was 29%, which is comparable to known dropout rates in Dutch mental healthcare (30%). Symptom reductions met selected benchmarks of naturalistic studies of face to face CBT. On the short-term (at post-test and six weeks follow-up), patients reported significant (P < .001) reductions in symptom severity, which represented a large pooled (uncontrolled) effect size of SMD = 1.4 (range: $0.7 \leq$ SMD $\leq$ 1.9). Among treatment completers, 71% reliably improved and 52%

experienced a clinically significant change (i.e., recovery). Follow-up measurements were difficult to interpret given an attrition rate of 67%. Nonetheless, available data suggested that improvements sustain up to one year after treatment.

4. Conclusion

A decade of research has provided compelling support for the efficacy and effectiveness of online CBT. Treatment adherence rate is high (82%), effect sizes are comparable to those of face to face CBT, and method and outcome generalize well to routine clinical practice. Despite limitations of the present evidence (most comparison groups were waiting lists, most long-term follow-up results were uncontrolled, outcome was determined through self-report measures, and the applicability of Interapy to other disorders is unclear), the results identify online CBT as a valuable addition to existing treatment options. Online treatment provides relatively easy access, and may facilitate the timely implementation of new evidence-based treatment methods in routine healthcare. Dutch regulatory health bodies have recognized this potential. In 2005, these bodies endorsed the services of the Interapy clinic as a valid alternative to regular, face to face treatment. Since then, costs of online treatment are reimbursed through public health insurance to all Dutch citizens with a GP-referral for psychotherapy. The implementation and dissemination of online treatment has started.

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