

Internet-Based Treatment of Perfectionism: A Randomized Controlled Trial Comparing Two Types of Self-help

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INTERNET-BASED TREATMENT OF PERFECTIONISM:
A RANDOMIZED CONTROLLED TRIAL COMPARING TWO TYPES OF
SELF-HELP*

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Perfectionism may be a clinically relevant problem on its own or as a part of other conditions. Internet-based cognitive behavioral therapy (ICBT) is a promising method for treating perfectionism. ICBT with guidance is recommended over unguided versions; still there remain questions concerning the importance of guidance in ICBT. In this study, seventy-eight self-referred participants were randomized to either ICBT with support or ICBT with support on request in an eight-week treatment of perfectionism. Primary outcome measures included two subscales from Frost Multidimensional Perfectionism Scale, and the Clinical Perfectionism Questionnaire. In addition to this depression, anxiety and quality of life were assessed. A mixed effects model revealed significant pre-post reductions on all measures for both groups. Neither significant differences nor considerable effects were detected between groups (Cohen's $d = 0.01-0.33$). In conclusion, both types of ICBT may be helpful in treating perfectionism.

Perfectionism seems to be something everyone experiences to a certain extent (Egan, Wade, Shafran, & Antony, 2014a), but with different levels of severity (Frost, Marten, Lahart, & Rosenblate, 1990). A distinction can be made between a type of perfectionism that is associated to competence and success and a problematic form of perfectionism (Frost et al., 1990). Of clinical interest is foremost the negative impact perfectionism has on individuals, i.e. *clinical* perfectionism (Shafran, Cooper, & Fairburn, 2002). Clinical perfectionism has been described by Shafran et al. (2002) as the “[t]he overdependence of self-evaluation on the determined pursuit of personally demanding, self-imposed, standards in at least one highly salient domain, despite adverse consequences” (p. 778). According to The Diagnostic and Statistical Manual of Mental Disorders perfectionism is not a clinical condition of its own (5th ed.; DSM-5; American Psychiatric Association, 2013). There are no figures of prevalence for perfectionism in the general public. Yet, it is still conceivable that perfectionism can cause significant personal distress for a group of people.

According to Shafran, Coughtrey, and Kothari (2016) perfectionism may be problematic for several reasons. A person with problems related to clinical perfectionism may for example spend unnecessarily long time working on different tasks, checking and redoing them. This type of behavior can be problematic and lead to less time being available for other areas of life and enjoyable activities, which in turn can affect quality

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of life and mood causing low spirits. Performance anxiety is common among people with clinical perfectionism, often related to domains such as work or social situations. Perfectionism can furthermore lead to procrastination or complete avoidance of certain situations or tasks. Conceivably, this could interfere with daily functioning, with possible severe consequences (Shafran et al., 2016). Furthermore, perfectionism has been suggested to play a part in the etiology and maintenance for several psychiatric disorders including anxiety disorders, depression and eating disorders (Egan, Wade, & Shafran, 2011). Studies have also indicated that perfectionism may impede treatment progress for Axis I diagnoses, such as depression and anxiety disorders (Egan et al., 2011).

Definitions and measures of perfectionism

Different theories have been put forward regarding the definition and construct of perfectionism (e.g. Burns, 1980; Frost et al., 1990; Hewitt & Flett, 1991; Shafran et al., 2002). A shared assumption among them is the understanding of a perfectionist as someone who sets high standards (Egan et al., 2014a). Many definitions have also focused on how perfectionism is related to self-worth and self-evaluation (Shafran et al., 2016). For example, Burns (1980) described a perfectionist as someone who sets unattainable goals and whose self-worth is dependent on achievements. He also pointed out that the exertion for excellence is self-defeating for a perfectionist.

Proponents of a multidimensional view of perfectionism integrated interpersonal aspects into the concept of perfectionism (e.g. Frost et al., 1990; Hewitt & Flett, 1991). In Hewitt and Flett's (1991) three-dimensional model of perfectionism both personal and social components are integrated; including self-oriented perfectionism, other-oriented perfectionism, and socially prescribed perfectionism. Frost et al. (1990) in turn introduced a multidimensional construct of perfectionism that's made up of six different dimensions: Concern over Mistakes, Personal Standards, Parental Expectations, Parental Criticism, Doubts about Actions, and Organization. The main dimension, Concern over Mistakes, is described as "(...) a tendency to interpret mistakes as equivalent to failure, and a tendency to believe that one will lose the respect of others following failure" (Frost et al., 1990, p.453). The Personal Standards dimension concerns high standards and their impact on self-evaluation. The Parental Expectations dimensions reflect beliefs about high expectations and perceived critique from parents. The Doubts about Actions dimension concerns a tendency to doubt oneself and one's work. The final dimension, Organization, concerns a preference for orderliness (Frost et al., 1990). Based on this conceptualization of perfectionism Frost et al. (1990) developed the *Frost Multidimensional Perfectionism Scale* (FMPS), one of the most popular measures of perfectionism (Shafran et al., 2016).

According to Shafran et al. (2002) the multidimensional approaches to perfectionism included dimensions that were not actually part of the perfectionism construct, but rather related issues, such as Parental Expectations and Parental Criticism. A cognitive behavioral model of perfectionism was therefore developed with the routine clinical practice in mind, aiming to improve the treatment of clinical perfectionism (Shafran et al., 2016). From this model the *Clinical Perfectionism Questionnaire* (CPQ) was developed (Egan et al., 2016). The questionnaire was designed to assess individual strivings to meet standards and the effect on self-evaluation when this fails (Egan et al.,

2016). The purpose of the CPQ is to detect changes in clinical perfectionism due to treatment (Shafran et al., 2016).

A cognitive-behavioral model of perfectionism

The clinical model of perfectionism was first presented in 2002 and renewed in 2010 (Shafran et al., 2002; Shafran, Egan & Wade, 2010). The updated version emphasized the role of behavioral components in the maintenance of perfectionism, such as different behaviors related to checking performance (Egan et al., 2014a). According to Shafran et al. (2002) a dysfunctional schema for self-evaluation constitutes the core of clinical perfectionism. Shafran et al. (2002) describe that self-evaluation in individuals with clinical perfectionism is largely dependent on the pursuit and accomplishment of personally demanding standards. This causes a vulnerability to self-criticism and negative self-evaluation when standards are not met. Domains in which the perfectionistic standards are held furthermore become critical for the schema of self-evaluation. An example of a possible perfectionistic domain is the domain of weight loss, with possible personal demanding standards concerning dietary restrictions (Shafran et al., 2002).

According to Shafran et al. (2002) a personal demanding standard is challenging for the individual that has made it their own. Not implying that it objectively seen would be considered extreme. A distinction can be made between pursuits for achieving high standards that are functional and those that come with adverse consequences. Thus, as described by Shafran et al. (2002) clinical perfectionism not only takes into account the setting of high personal standards but also considers how this affects self-image and evokes self-criticism as a reaction to perceived failure. According to Shafran et al. (2002) perfectionism is considered pathological when the pursuit of standards continues in spite of negative consequences of emotional, behavioral, or cognitive character. Potential rewards that can come of clinical perfectionism are also mentioned; these involve getting praise from others and having a sense of being in control.

The clinical model of perfectionism illustrates the factors maintaining the cycle of clinical perfectionism (see figure 1). At the root of perfectionism is a strong fear of failure and a tireless strive to succeed (Shafran et al., 2002). Shafran et al. (2002) assume that perfectionists internalize their standards and operationalize them as rigid rules. For the achievability of these standards self-control is exerted and enjoyable activities are restricted. The individual also frequently evaluates their performance. This is done in a biased manner where selective attention is focused on failure (Shafran et al., 2002). Cognitive biases involved in the maintenance of perfectionism include dichotomous thinking, overgeneralizing and double standards (Egan et al., 2014a). Common behaviors include checking and rereading work, or replaying a certain situation in one's head (Shafran et al., 2002). Performance is also frequently checked in relation to set standards and goals. The individual can do this by seeking assurance from other people or by comparing themselves to other people (Egan et al., 2014a).

According to the model, self-criticism will result from not meeting personal standards, maintaining a negative self-image as well as influencing mood and behavior (Shafran et al., 2002). In the case of achieving personal standards this temporarily gives a sense of relief. However it also brings the individual to re-examine standards and raise them

since prior standards are deemed too readily attainable. Furthermore, a strong fear of failure can cause some individuals to procrastinate or completely avoid doing certain tasks. This in turn can elicit more self-criticism and a sense of needing to work harder. All these different scenarios are assumed to reinforce a self-evaluation dependent on achievements (Shafran et al., 2002; Egan et al., 2014a).

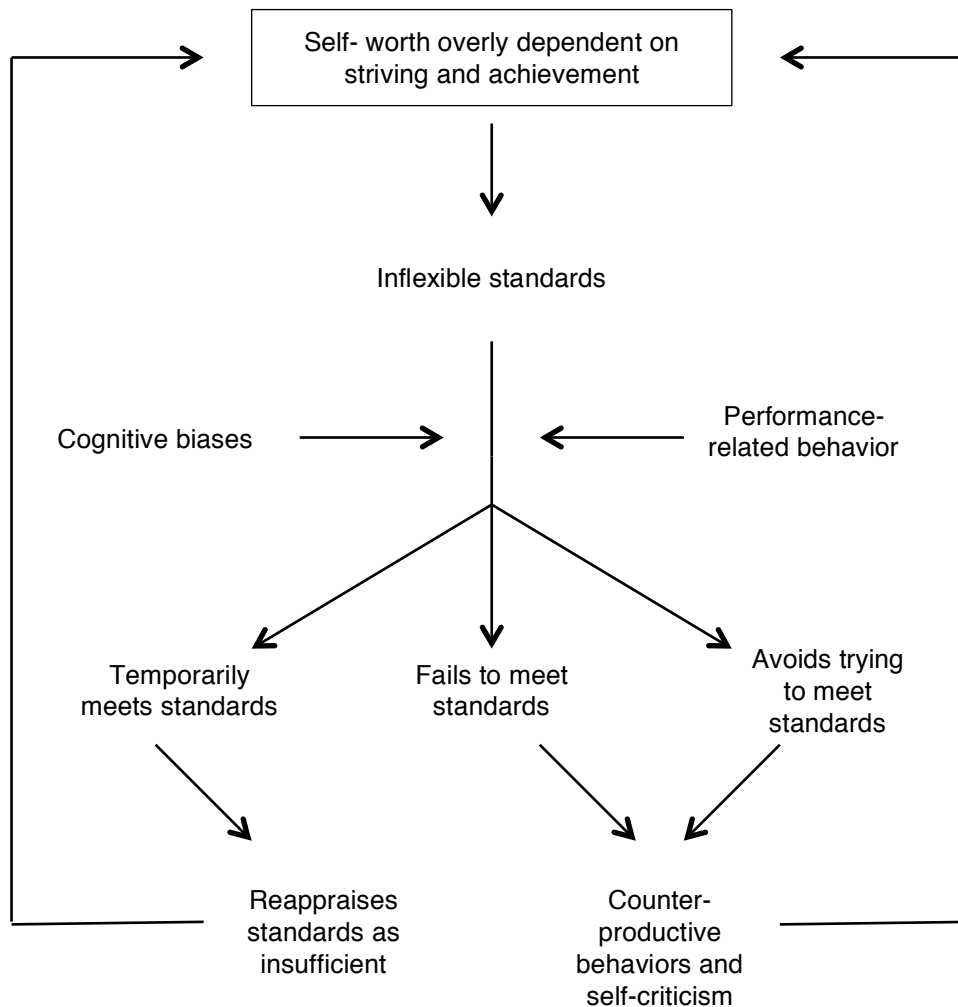


Figure 1. The clinical model of perfectionism, derived from the book “Overcoming Perfectionism” (Shafran et al., 2010).

A transdiagnostic perspective on perfectionism

Recent research has focused on perfectionism as a transdiagnostic process (e.g. Egan et al., 2011). A transdiagnostic approach as an alternative to the disorder specific perspective assumes that there are certain essential cognitive and behavioral processes that exist across disorders. Focusing on these factors is presumed to lead to a greater understanding of different psychological conditions and how to treat them (Mansell, Harvey, Watkins, & Shafran, 2009). Furthermore, a transdiagnostic perspective may help explain comorbidity across disorders, and perfectionism may contribute to this understanding (Egan et al., 2011). Perfectionism has for example been found across a range of psychiatric disorders. Findings from a large study, examining 345 patients referred to a clinic for anxiety disorders, indicated that scores on scales of

perfectionism, including FMPS, correlated with the number of diagnoses on Axis I (Bieling, Summerfeldt, Israeli & Antony, 2004). In a review of perfectionism as a transdiagnostic process Egan et al. (2011) present a body of empirical evidence suggesting that perfectionism may be a maintaining and risk factor for several psychiatric conditions.

Perfectionism has been linked to anxiety disorders such as obsessive-compulsive disorder, social anxiety disorder, and panic disorder (Egan et al., 2011). Antony, Purdon, Huta, and Richard (1998) found that perfectionism, measured with FMPS, was elevated in these patient groups in comparison to a control group. Egan et al. (2011) also present data suggesting that perfectionism may interfere with patient's engagement in treatment and help maintain conditions such as obsessive-compulsive disorder and social anxiety disorder. In addition to different anxiety disorders, the relationship between perfectionism and eating disorders has received much attention. Perfectionism is considered one of the core maintaining factors behind eating disorders (Fairburn, Cooper, & Shafran, 2003), and it has also been discussed as a likely risk factor for developing eating disorders (Egan et al., 2011).

The connection between depression and perfectionism has been covered in several studies and perfectionism is suggested to help maintain depression (Egan et al., 2011). In a study by Sassaroli et al. (2008) levels of perfectionism were raised for individuals with depression in comparison to a control group on the FMPS. In addition to these findings, prospective studies have suggested that levels of perfectionism can predict levels of depression at a later stage (Dunkley, Sanislow, Grilo, & McGlashan, 2006; Dunkley, Sanislow, Grilo, & McGlashan, 2009). These studies have used a subscale from the *Dysfunctional Attitude Scale* (DAS; Weissman & Beck, 1978) assessing self-criticism, as a measure of perfectionism. DAS assesses negative attitudes related to depression (Weissman & Beck, 1978). The authors reported findings from a three and four year follow-up of a clinical group of depressed patients, suggesting that the subscale from DAS could predict an increase on a depression scale at these two time points (Dunkley et al., 2006; Dunkley et al., 2009). According to Dunkley et al. (2009) the findings suggest that self-criticism may have influenced vulnerability for depression in the sample of individuals studied.

Perfectionism has furthermore been found to have a negative impact on a patient's engagement in treatment as well as have a negative impact on treatment outcome for disorders such as depression and anxiety (Egan et al., 2011). For example, Blatt and Zuroff (2005) reported findings from treatments of depression indicating that pretreatment levels of perfectionism significantly interfered with treatment outcome and the reduction of depressive symptoms at post-treatment assessment, as well as at follow-up assessment. Another line of evidence regarding perfectionism as a transdiagnostic phenomenon comes from outcome data indicating that treating perfectionism not only reduces perfectionism, but many times also symptoms of depression and anxiety (Egan et al., 2011). These findings suggest that treating perfectionism can have a positive effect on conditions not specifically targeted by the treatment, according to Egan et al. (2011).

In conclusion, research suggests a link between perfectionism and anxiety disorders. Perfectionism has furthermore been associated to depression. There are findings suggesting a connection between self-criticism, as an aspect of perfectionism, and depression. Findings regarding perfectionism as a transdiagnostic process are promising. However, there still remain questions concerning the relationship between perfectionism and different psychiatric diagnoses. For example, it is not fully clear how perfectionism contributes to maintain different conditions. Moreover, to understand perfectionism as a risk factor for the development of different psychiatric conditions more longitudinal studies are required. Still, findings on perfectionism as a transdiagnostic phenomenon may be of value to the mental health care system offering some insight into possible shared cognitive and behavioral processes across disorders. Egan et al. (2011) discuss clinical implications and suggest that perfectionism should be specifically targeted in treatment, if it emerges as a clinically relevant problem impeding a client's quality of life.

Treatment studies of perfectionism

Studies focusing on treatment of perfectionism are part of a relatively new research field. There are comparably few effectiveness and efficacy studies to date. The studies that have been conducted have focused primarily on cognitive behavioral approaches (Egan et al., 2014a). Cognitive behavioral therapy (CBT) is a popular and effective method for treating a number of different problems and psychological conditions (Hofmann, Asnaani, Vonk, Sawyer, & Fang, 2012). According to Hofmann et al. (2012) CBT can be described as a "family of interventions" that integrates different forms of therapeutic techniques, including strategies focusing on cognitive, behavioral, and emotional components. The theoretical foundation for CBT is learning and cognitive theory (Westbrook, Kennerley, & Kirk, 2011). CBT interventions focus on the present, employ an empirically guided approach, assume active client participation and are time-limited (Farmer & Chapman, 2016).

A meta-analysis by Lloyd, Schmidt, Khondoker and Tchanturia (2015) summarizes the research status of cognitive behavioral treatments of perfectionism. The results of the meta-analysis are promising, suggesting that cognitive behavioral interventions can be successful in treating perfectionism and in reducing symptoms of related conditions. Large pooled effect sizes were demonstrated for pre-post treatment reductions on measures of perfectionism and medium sized pooled post treatment effect sizes for measures of depression and anxiety. Lloyd et al. (2015) discuss some of the limitations of their findings concerning the studies included in the meta-analyses. Complicating matters concern a variation of study designs and measures used in the different studies. Another possible confounding variable, mentioned by Lloyd et al. (2015), concerns the heterogeneity of the participants included in the individual studies. Some studies included self-referred participants, while others included patients referred from clinics. The different studies also included participants with different psychiatric diagnoses.

A number of randomized controlled trials (RCTs) have so far been conducted on CBT for perfectionism, abbreviated as CBT-P. Riley, Lee, Cooper, Fairburn and Shafran (2007) conducted the first RCT evaluating CBT-P. In Riley and colleague's study (2007), CBT-P was compared to a waitlist control group in a mixed clinical sample. Significant pre-post reductions on measures of perfectionism, anxiety, and depression

were found for the treatment group, and improvements were maintained at a 4-month follow-up. In another trial, composed of a mixed clinical sample of anxiety disorders, depression, and eating disorders, group CBT-P was compared to a waitlist condition. Significant reductions on measures of perfectionism, and psychological symptoms such as depression, anxiety, and an increase of quality of life, and self-esteem, were reported at post-treatment assessment, and maintained at a 6-month follow-up (Handley, Egan, Kane, & Rees, 2015).

CBT- P has also been evaluated using different types of low intensive treatments with self-help books, showing promising results. Pleva and Wade (2006) compared a guided self-help to a pure self-help treatment in a non-clinical sample. Steele and Wade (2008) investigated the usage of a guided self-help treatment for individuals with bulimia nervosa. Self-help interventions targeting perfectionism have also been evaluated using web-based formats. In a study by Arpin-Cribbie, Irvine, and Ritvo (2012), a intervention targeting perfectionistic beliefs was compared to a general stress management intervention in a sample of college students. Results were in favor of the intervention targeting perfectionism, demonstrating significant pre-post reductions on measures of perfectionism and distress (Arpin-Cribbie et al., 2012).

Due to an increased demand of Internet-Based treatments CBT-P has also been evaluated for the Internet (Shafran et al., 2016). In a study by Egan et al. (2014b) face-to-face CBT-P was compared to pure online self-help CBT-P, in a non-clinical sample. Both treatment conditions were successful, resulting in significant reductions on measures of perfectionism at the end of treatment and maintained at a six months follow-up. However, for the face-to-face condition, significant reductions were also obtained on secondary outcome measures of depression, anxiety, stress, as well as an increase in self-esteem. Results from this study are nevertheless promising regarding the possibility of treating perfectionism with CBT-P in a self-help format over the Internet.

Internet-Based Cognitive Behavior Therapy

During the last decade there has been an upsurge on research on Internet-Based Cognitive Behavior therapy (ICBT). According to Spek et al. (2007), CBT is well suited for usage in a computer format due to its structured format. There are several different types of Internet-based therapy available today. Some demand identification while others come in unrestricted formats open for all, and not preceded by a screening process (Andersson, Carlbring, Ljótsson, & Hedman, 2013). A thorough screening process is however generally recommended for best treatment outcome (Andersson, Carlbring, Berger, Almlöv, & Cuijpers, 2009). In Sweden, the most common form of ICBT comes in the form of a self-help guide delivered over the Internet. There the patient has access to a qualified therapist who lends guidance and support during treatment (Andersson, Cuijpers, Carlbring, Riper, & Hedman, 2014).

Internet-based treatments are composed of several different treatment modules. These can be compared to text chapters, and contain material that correspond to a regular session in traditional face-to-face CBT treatment. ICBT treatments typically consist of 6-15 treatment modules (Andersson et al., 2014), and the length of an ICBT treatment usually corresponds to the length of a face-to-face treatment (Andersson et al., 2013). According to Andersson et al. (2013) ICBT is as an alternative to traditional face-to-

face CBT. The working treatment components in ICBT are most likely the same as those active in face-to-face therapy. For example exposure techniques may be used in treatment of anxiety disorders. ICBT also requires the same amount of effort from the patient as traditional therapy would (Andersson et al., 2013).

ICBT has primarily been used to treat mild to moderate psychological conditions, and research suggests that ICBT is an effective method for treating conditions such as depression, panic, social anxiety, and generalized anxiety disorders (Andersson et al., 2013). ICBT has also shown promising results in treating other conditions such as irritable bowel syndrome (Ljótsson et al., 2010), and problems associated to procrastination (Rozenal, Forsell, Svensson, Andersson, & Carlbring, 2015). In a meta-analysis by Andersson et al. (2014), pooled effect sizes at post-treatment suggested comparable effects between ICBT and face-to-face CBT. However, few studies have looked at long-term effects of ICBT, limiting what conclusions may be drawn about how treatment effects are maintained over time in comparison to face-to-face CBT. When long-term effects of ICBT were assessed at a five-year follow-up of ICBT for social anxiety they were nevertheless found to be comparable to face-to-face CBT (Hedman et al., 2011).

There are several advantages to be mentioned regarding ICBT in comparison to traditional face-to-face therapy. These include a greater distribution of and access to evidenced based care (Andersson et al., 2013). ICBT can reach patients who otherwise might not have access to treatment (Cuijpers, Van Straten, & Andersson, 2008). Due to the format, delivering therapy via ICBT is also less time consuming for the therapist (Andersson et al., 2014). Another advantage with ICBT is that it enables therapists to regularly supervise client symptoms, since symptom data can be collected on a regular basis (Andersson et al., 2013). Furthermore there is a growing amount of evidence suggesting the cost-efficacy of Internet interventions (Donker et al., 2015; Musiat & Tarrier, 2014). There are also several other aspects of ICBT that may be beneficial for the client, including the possibility of being able to contact a therapist at any time. Furthermore the structured format, in which ICBT is delivered, may also suit certain clients (Rozenal et al., 2014).

Some of the challenges that have been mentioned in regard to Internet-based treatments include security and technical issues. There may also be challenges pertaining to the relationship between therapist and patient including the therapeutic alliance (Yuen, Goetter, Herbert, & Forman, 2012). However, the importance of a therapeutic alliance within ICBT is not self-evident due to the restricted amount of contact between therapist and client (Andersson et al., 2012). Yet it is imaginable that a therapeutic relationship could develop within ICBT, as there is therapeutic interaction between therapist and client through messages. Still it is conceivable that the bond between therapist and patient will differ in comparison to the one that develops within face-to-face therapy (Andersson et al., 2012). Rozenal et al. (2014) have discussed possible negative effects of ICBT. Due to the limited amount of contact between therapist and client there is a risk for misunderstandings. It is possible that some clients may misinterpret instructions and execute exercises wrongly, which could bring adverse consequences (Rozenal et al., 2014).

Therapist guidance in Internet-based treatments

The amount of guidance or support provided in ICBT varies between treatments. For clarification, “support” and “guidance” are used synonymously in studies of ICBT, when discussing the therapist function. Therapist support can be as frequent as in regular therapy, less frequent, or the treatment may not involve any support at all (Spek et al., 2007). ICBT treatment involving guidance can be categorized according to whether guidance is delivered directly or with a time lag. Direct communication can be handled via telephone or video whereas postponed guidance is often delivered via encrypted messages (Andersson & Titov, 2014). In general, research suggests that some amount of contact with a clinician during treatment has a positive effect on treatment outcome (Andersson & Titov, 2014). However, Andersson and Titov (2014) have suggested that therapist expertise may be less important in Internet-based treatments in comparison to face-to-face treatment, as long as the treatment program in itself is of adequate quality and sufficiently engaging for the client.

The type of guidance usually delivered within ICBT can be referred to as “low intensive” or “minimal guidance” (Andersson, 2015). Therapists spend approximately 15 minutes on weekly feedback on each participant (Andersson et al., 2013). Guidance delivered in ICBT usually consists of responding to questions, lending support and reviewing assignments (Paxling et al., 2013). Therapist behaviors that have been suggested to have a positive influence on clients adherence in ICBT, include reinforcing and prompting treatment work, reinforcing self-efficacy, and conveying empathy, whereas flexibility regarding deadlines for homework assignments seems to have a negative effect on treatment outcome (Paxling et al., 2013).

Guided versus unguided treatments

Research has suggested that treatments including guidance are more successful than unguided treatments (Andersson et al., 2013). Unguided treatments also generally led to higher dropout rates than guided treatments (Andersson, Rozental, Rück, & Carlbring, 2015). Meta-analysis have reported effect sizes in favor of guided treatments for ICBT targeting depression and anxiety (Andersson & Cuijpers, 2009; Richards & Richardson, 2012; Spek et al., 2007). Spek et al. (2007) reported a large pooled mean effect size for guided treatments (Cohen’s $d = 1.00$), whereas for the unguided versions the effect sizes were small ($d = 0.24$). Andersson and Cuijpers (2009) reported similar findings. In addition to these findings a review by Johansson and Andersson (2012) suggests a strong correlation between the amount of therapist support and treatment outcome measured in effect sizes in ICBT for depression. In another review comparing guided to unguided treatments for mixed clinical conditions, a pooled Standardized Mean Difference (SMD) of $-.27$ was reported, in favor of guidance (Baumeister, Reichler, Munzinger, & Lin, 2014). The number of completed treatment modules and adherence rates were also higher for the guided interventions (Baumeister et al., 2014).

Some studies have however reported contradicting results with no significant differences between guided and unguided treatments. In a trial comparing guided to unguided ICBT for social anxiety, both conditions were successful in comparison to a waitlist group (Furmark et al., 2009). In another study that compared a guided to an unguided treatment of depression, no significant differences were found between the two treatment conditions, although the guided version produced somewhat larger effect

sizes when compared to the waitlist (Berger, Hämmerli, Gubser, Andersson, & Caspar, 2011a). A few studies have also indicated that when given the choice some participants may prefer unguided over guided treatments (Andersson & Titov, 2014). Yet the extent of this preference among people seeking Internet-based care is not known.

ICBT has also been evaluated without regular guidance but with the possibility of requesting therapist support. To the author's knowledge very few trials have evaluated this type of treatment so far. In a study by Berger et al. (2011b) on ICBT for social anxiety, three different treatment conditions were compared: a guided treatment, a "pure" unguided treatment and a treatment without guidance but with the possibility of requesting support. The third condition was added since not all participants were assumed to require treatment support, or the same amount of support. No significant differences between the conditions were found on treatment outcome (Berger et al., 2011b). A similar type of intervention was evaluated in a study by Rheker, Andersson and Weise (2015). In an Internet-based treatment of tinnitus, an unguided intervention was compared to an intervention without guidance but with the possibility of requesting support. The results of this study demonstrated no significant differences between the two conditions on treatment outcome (Rheker et al., 2015).

In conclusion, the majority of research on Internet-based treatment including several meta-analysis and reviews point in the direction of the favorability of guided to unguided treatments. However, findings have been mixed regarding the impact of guidance, with a range of effect sizes reported in different studies. Furthermore there are some studies reporting no significant differences between guided and unguided treatments. Usually unguided treatments are conducted without support, recently however, treatments without guidance have been evaluated with the possibility of requesting support, with promising results. This type of study enables investigations into how much guidance is needed for improvement to take place in ICBT.

The Devin treatment study

Devin is a joint project between researchers at Linköping University, Stockholm University, and University College of London. The purpose of the Devin treatment study was to evaluate if an eight-week Internet-based CBT treatment for perfectionism could reduce symptoms of clinical perfectionism, and related conditions as well as enhance quality of life in a sample of self-referred participants. Another purpose was to contribute to the understanding of perfectionism as a transdiagnostic phenomenon, as well as to provide further knowledge regarding treatment of perfectionism with CBT (Roos & Thelander, 2016). The treatment was based on the self-help book "Overcoming Perfectionism" (Shafran et al., 2010). Students and faculty at Linköping University made adjustments to the treatment, making it more easily available and accommodating it to a Swedish context (Roos & Thelander, 2016).

The aim of the CBT-P treatment as described in the self-help book by Shafran et al. (2010) is to help participants understand their perfectionism, and help them find ways to overcome their perfectionism. The first part of the treatment focuses on psychoeducation helping individuals understand the relationship between perfectionism and performance, and how different behaviors help maintain a negative cycle of perfectionism. A large part of the treatment then focuses on helping participants to

challenge perfectionist cognitions and perfectionistic behaviors, using surveys, behavioral experiments and exposure exercises. The treatment also includes work on self-worth and self-evaluation, with the purpose of making them less dependent on achievements. In conjunction to this the participants also work on self-compassion, with the purpose of reducing the strength of their inner self-critical voice.

Roos and Thelander (2016) as part of their master-thesis studied the main effects of the Devin treatment. Results from this study showed that participants had improved significantly on all outcome measures in comparison to a waitlist control group ($p < .001$). Obtained effect sizes ranged from moderate to large ($d = 0.71-1.33$). Outcome measures included measures of perfectionism, depression, dysfunctional attitudes and quality of life (Roos & Thelander, 2016). The Devin treatment also generated two other master essays. Skoglund and Trosell (2016) investigated whether diagnosis, degree of self-compassion and worry could predict treatment outcome (2016). Landström and Örténholm (2016) explored if knowledge about perfectionism and CBT correlated with treatment outcome, in addition to investigating the usage of a behavioral test.

Purpose of the study

Promising findings have been reported regarding the possibility of treating perfectionism with CBT (Lloyd et al., 2015). Furthermore recent studies have shown encouraging results regarding the possibility of treating perfectionism in both unguided and guided formats over the Internet (Egan et al., 2014b; Roos & Thelander, 2016). However, these two formats of delivering ICBT have not been compared to each other in a treatment of perfectionism before. Hence, the importance of guidance in ICBT for perfectionism is yet to be explored. Moreover, recent studies have suggested that ICBT may be successful when conducted without regular support but with support on request. A question of interest was therefore how treatment support in ICBT for perfectionism would influence treatment outcome, concerning measures of perfectionism, depression, dysfunctional attitudes, anxiety, and quality of life, in addition to other treatment relevant aspects, such as adherence.

The main purpose of this study was to compare two types of ICBT: ICBT with regular therapist support (ICBT Regular Support; ICBT-RS) and ICBT with support on request (ICBT Support on Request; ICBT-SOR) in an eight-week treatment of perfectionism. The main research question was how ICBT with regular support would compare to ICBT with the possibility of requesting support.

Hypothesis

It was presumed that both treatments (ICBT-RS & ICBT-SOR) would lead to statistically significant pre-post reductions on the three main outcome measures assessing perfectionism, The Concern over Mistakes (CM) and Personal Standards (PS) subscales from FMPS, and CPQ. In addition to secondary outcome measures of anxiety, depression, dysfunctional attitudes and an increase in quality of life. However in line with results from several meta-analyses, treatment outcome was presumed to be favorable for the group receiving regular treatment support (ICBT-RS) in comparison to the group receiving treatment with the possibility of requesting support (ICBT-SOR).

Method

Participants and recruitment

The study was advertised in social media, by flyers at the universities and through selected websites (www.studie.nu and www.psykologifabriken.se). The study targeted people who experienced problems related to perfectionism. For more information about the registration process, applicants were advised to visit the Devin study website (Devin research group, 2016). On the study website criteria for inclusion and exclusion were listed. These included being at least 18 years old, having adequate Swedish language skills and experiencing problems primarily related to clinical perfectionism. Exclusion criteria were pregnancy, meeting criteria for anorexia nervosa, recent changes in medication (within the last two months), presence of psychotic symptoms or an elevated suicide risk, undergoing other psychological treatment during the study time period or being in need of more extensive psychiatric care.

Figure 2 illustrates a flow chart of participants through each stage of the larger Devin study. At registration, applicants answered questions concerning demographic data, such as age, gender, educational level, and marital status, and filled out the outcome measures. Applicants meeting inclusion criteria at registration were interviewed over the telephone for a clinical assessment of their problems. For this purpose the *MINI International Neuropsychiatric Interview*, Swedish version 7.0 (M.I.N.I. 7.0; Lecrubier et al., 1997), was used. MINI is a brief diagnostic structured interview employed to make clinical assessment based on the Diagnostic and Statistical Manual (DSM-IV) and ICD-10 psychiatric disorders (Sheehan et al., 1998). Suicide risk was assessed with a question from the Patient Health Questionnaire (PHQ-9; Löwe, Kroenke, Herzog, & Gräfe, 2004) and the MINI.

Decisions concerning inclusion and exclusion were made at a consultation conference at Linköping University with the head of the project, professor Gerhard Andersson, a licensed psychologist and psychotherapist with more than 15 years of experience conducting and supervising ICBT. Participants were then informed by e-mail about group inclusion and dates for treatment start. Applicants who had been excluded were contacted by telephone and given an explanation for the exclusion. When judged as necessary, participants were referred to other healthcare settings or advised where they could seek help. Table 1 illustrates the socio-demographic characteristics of participants at the pre treatment assessment.

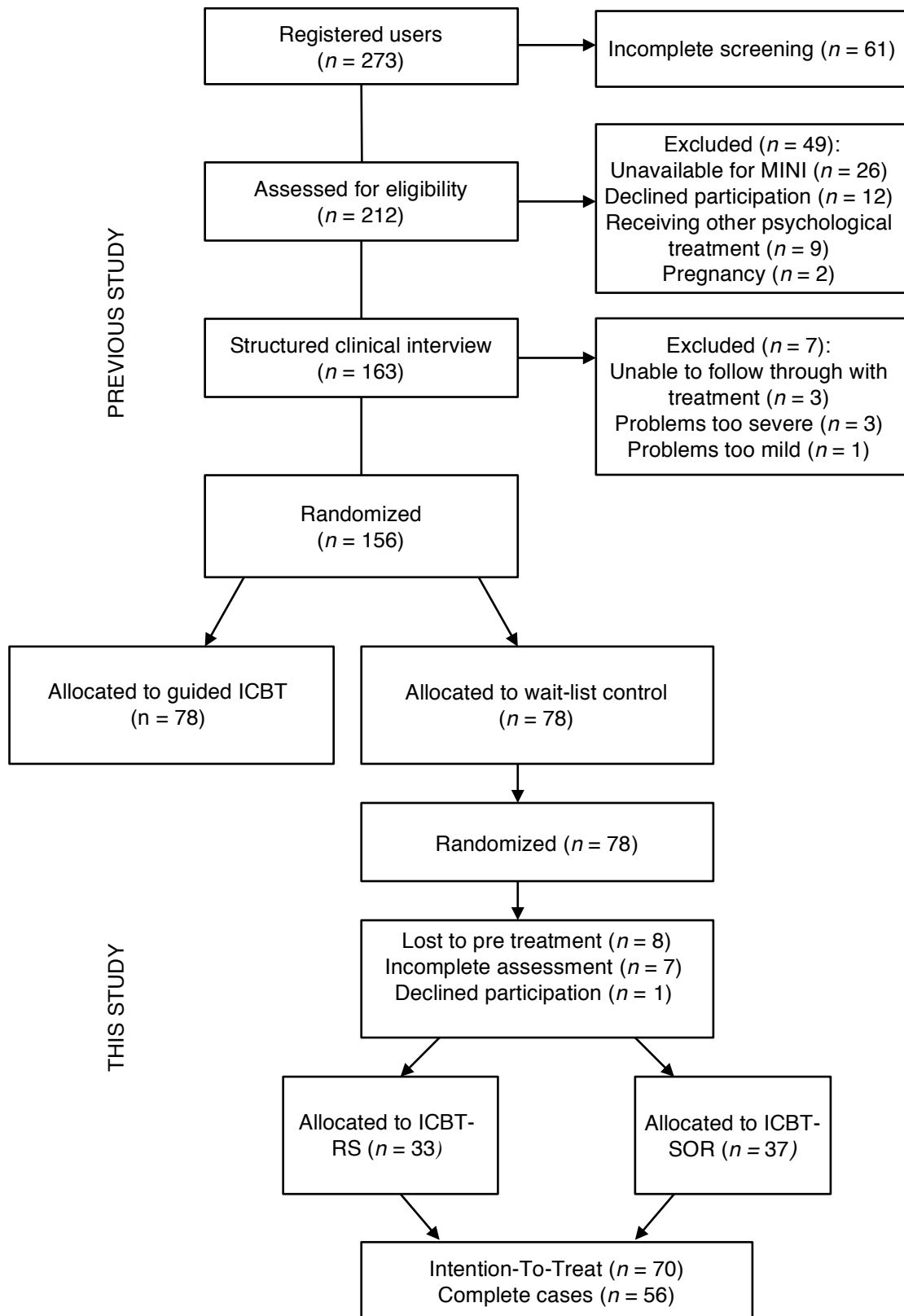


Figure 2. Flow chart of participants through each phase of the study. MINI = MINI-International Neuropsychiatric Interview. ICBT-RS= Regular support; ICBT-SOR = Support on request.

Table 1
Sociodemographic Characteristics of Participants at the Pre Treatment Assessment

Baseline characteristic	ICBT-RS (<i>n</i> = 33)	ICBT-SOR (<i>n</i> = 37)	Full sample (<i>n</i> = 70)
Gender: <i>n</i> female (%)	29 (87.9)	34 (91.9)	63 (90)
Age (years): <i>M</i> (<i>SD</i>)	33.5 (8.2)	34.1 (7.6)	33.8 (7.8)
Marital status: <i>n</i> (%)			
Single	7 (21.2)	9 (24.3)	16 (22.9)
Married/Partner	25 (75.8)	27 (73.0)	52 (74.3)
Divorced/Widow	1 (3.0)	1 (2.7)	2 (2.9)
Children: <i>n</i> (% yes)	12 (36.4)	20 (54.1)	32 (45.7)
Highest educational level: <i>n</i> (%)			
Elementary school	0 (0.0)	1 (2.7)	1 (1.4)
High school	7 (21.2)	10 (27.0)	17 (24.3)
University	26 (78.8)	24 (64.9)	50 (71.4)
Postgraduate	0 (0.0)	2 (5.4)	2 (2.9)
Employment: <i>n</i> (%)			
Unemployed	1 (3.0)	3 (8.1)	4 (5.7)
Student	12 (36.4)	7 (18.9)	19 (27.1)
Employed	18 (54.5)	22 (59.5)	40 (57.1)
Parental leave	0 (0.0)	3 (8.1)	3 (4.3)
Sick leave (> 3 months)	0 (0.0)	2 (5.4)	2 (2.9)
Other	2 (6.1)	0 (0.0)	2 (2.9)
Psychiatric diagnosis <i>n</i> (% yes)	3 (9.1)	2 (5.4)	5 (7.1)
Psychotropic medication: <i>n</i> (% yes)	6 (18.2)	7 (18.9)	13 (18.6)

Note. ICBT-RS= ICBT Regular support; ICBT-SOR = ICBT Support on request

Material

Website and external e-mail

Communication between therapists and participants was primarily confined to the Devin study website. The Devin website was handled through the “Iterapi-platform”, designed to be used for research studies (Vlaescu, Alasjö, Miloff, Carlbring, & Andersson, 2016). Through the website participants received and sent messages to their assigned therapists. Access to the treatment material was handled through the website and the questionnaires were distributed via the website. Participants used a personal logon to open and work on the different treatment modules and to access and fill out the

questionnaires. The study had an external email account used for non-treatment specific correspondence with the participants, for instance, replying to questions concerning technical support.

Primary outcome measures

Frost Multidimensional Perfectionism Scale: Concern over mistakes and Personal Standards subscale (FMPS CM & FMPS PS; Frost et al., 1990). FMPS CM and FMPS PS were used to measure clinical perfectionism. The whole scale FMPS consists of 35 items (CM=9; PS= 7), and measures six dimensions of perfectionism (Frost et al., 1990). Questions are answered on a five-point Likert-type format ranging from “strongly disagree” to strongly agree” (Frost et al., 1990). Frost et al. (1990) have reported data attesting to the internal reliability ($\alpha = .90$) and preliminary data concerning the validity of the whole scale FMPS. Only the CM and PS subscales from FMPS were used in this study, since they are considered to reflect clinical perfectionism (Riley et al., 2007). Steele et al. (2013) reported that the internal consistency was good for both the CM and PS subscales ($\alpha = .91$ and $\alpha = .79$, respectively). In the Devin study internal consistency for FMPS CM was $\alpha = .85$, and for FMPS PS $\alpha = .65$.

The *Clinical Perfectionism Questionnaire* (CPQ) is a brief 12-item questionnaire measuring clinical perfectionism over the past month (Egan et al., 2016). Items are based on a 4-point Likert-scale ranging from 1 (not at all) to 4 (all of the time). Findings regarding the reliability and validity of CPQ are mixed (Stoeber & Damian, 2014) and the psychometric properties of this measure are still being evaluated (Shafran et al. 2016). However, findings suggesting acceptable reliability were found when CPQ was tried in an eating disorder population ($\alpha = .82$) (Egan et al., 2016). Egan et al. (2016) also found strong correlations between CPQ and other measures of perfectionism and psychopathology in a non-clinical sample. Furthermore Chang and Sanna (2012) reported a good internal reliability ($\alpha = .83$) for CPQ when tried in a nonclinical sample. Chang and Sanna (2012) also reported that CPQ correlated positively with measures of maladjustment including symptoms of depression, anxiety and stress providing support for the validity of the measure. Stoeber and Damian (2014) reported large positive correlations between CPQ and other measures of perfectionism, including FMPS CM and PS. In the Devin study internal consistency was $\alpha = .66$ for CPQ.

Secondary measures

Dysfunctional Attitude Scale (DAS; Weissman & Beck, 1978), DAS is a self-assessment scale measuring dysfunctional negative attitudes (Weissman & Beck, 1978). The questionnaire consists of 40 items and for each item there are seven response categories ranging from totally agree to totally disagree (Weissman & Beck, 1978). In a study of depressed patients the 40-item DAS demonstrated good test-retest reliability and internal consistency (Weissman & Beck, 1978). In a study of depressed patients, factor analysis revealed two stable factors in DAS, perfectionism and need for social approval, both with good internal consistency ($\alpha = .91$ and $.82$) (Imber et al., 1990). In the Devin study internal consistency was $\alpha = .91$, for DAS.

Patient Health Questionnaire 9-Item Scale (PHQ-9; Kroenke, Spitzer, & Williams, 2001) is a nine-item self-assessment scale for symptoms of depression based on the DSM-IV diagnostic criteria (Kroenke et al., 2001). The questionnaire assesses and

scores DSM-IV criteria of depression during the last two weeks on a 4 point Likert-scale ranging from zero (“not at all”) to three (“nearly every day”) (Kroenke et al., 2001). Results from a meta-analysis by Gilbody, Richards, Brealey, and Hewitt (2007) suggest that PHQ-9 has good diagnostic properties, with a high sensitivity (92%) and specificity (80%) concerning the ability to correctly diagnose major depression. For the purpose of measuring depression severity the PHQ-9 is considered to be a reliable and valid measure (Kroenke et al., 2001). The internal- and test-retest reliabilities are excellent (Kroenke et al., 2001). In the Devin study internal consistency was $\alpha = .84$, for PHQ-9.

Generalized Anxiety Disorder 7-Item Scale (GAD-7; Spitzer, Kroenke, Williams, & Löwe, 2006) is a brief self-report scale used for screening of generalized anxiety disorder. It consists of 7 items based on the DSM- IV criteria. Each question is rated from 0 (“not at all”) to 3 (“nearly every day”) over the past two weeks. Reliability and validity concerning criterion, construct, factorial, and procedural validity are good (Spitzer et al., 2006). In the Devin study internal consistency was $\alpha = .87$, for GAD-7.

Brunnsviken Brief Quality of Life Inventory (BBQ; Lindner et al., 2016) is a 12-item questionnaire measuring quality of life and life satisfaction on the following six dimensions: leisure time, view on life, creativity, learning, friends and friendship, and view of self (Lindner et al., 2016). Each item is rated on a five-step Likert-scale ranging from 0 (strongly disagree) to 4 (strongly agree). BBQ has been evaluated in both a clinical and in a non-clinical sample and is suggested to be a valid and reliable measure of quality of life (Lindner et al., 2016). In the Devin study internal consistency was $\alpha = .70$, for BBQ.

Other clinical instruments

MINI International Neuropsychiatric Interview (M.I.N.I. 7.0; Lecrubier et al., 1997) MINI has good validity and reliability, and is suggested to be comparable to other clinical diagnostic interviews (Lecrubier et al., 1997).

The Devin treatment

The treatment consisted of eight treatment modules. See table 2 for contents. Each module contained several therapeutic interventions and exercises for participants to work on. A total of 33 homework assignments and exercises of different sizes and types were included in the treatment program. The Devin treatment program covered a total of 121 pages.

Table 2

Summary of the treatment modules included in the Devin-treatment

Module and title	Summary of contents
1. <i>Understanding your perfectionism</i>	Information about the treatment and psychoeducation on perfectionism.
2. <i>Your own model, values and motivation</i>	Formulation of an individualized maintenance model of perfectionism. Work on values and motivation.

3. <i>Surveys and behavioral experiments</i>	Introduction to working with surveys and behavioral experiments as well as a section on the importance of making time for participation in pleasant events.
4. <i>Dealing with perfectionist behaviors</i>	Psychoeducation and exercises focusing on avoidant and safety behaviors, problem solving, exposure with response prevention and procrastination. Work on behavioral experiments and surveys.
5. <i>New ways of thinking</i>	Exercises focusing on challenging cognitive biases such as all or nothing thinking, rigid rule following and only directing one's attention to negative events.
6. <i>Self-criticism or self-compassion?</i>	Psychoeducation on self-criticism and self-compassion and exercises focusing on increasing self-compassion
7. <i>Self-worth</i>	Exercises focusing on the notion of self-worth and continued work on values.
8. <i>To maintain and keep a positive change</i>	Exercises focusing on self-evaluation and relapse prevention. Formulation of an individual maintenance program.

Design and procedure

The study is a randomized controlled trial including self-recruited participants allocated to the waitlist condition in the larger Devin study. Two active treatments were compared: ICBT-RS and ICBT-SOR. Outcome measures were distributed at registration, pre-treatment and post-intervention. Due to the design of the study outcome measures were distributed a total of three times for the waitlist condition. In addition to pre- and post- assessment, they were also distributed at the onset of the eight-week treatment period following the eight-week waiting period. Thus, pre-assessment was conducted at two different times for the waitlist group, at screening and at pre-treatment assessment. Post-assessment was carried out after the eight-week treatment period and consisted of the same outcome measures used at the pre-assessment, with the addition of questions concerning experiences with the treatment program.

Furthermore, as part of another project connected to the larger Devin study, participants were asked to complete behavioral and knowledge tests at two different time points: at the first pre-assessment and after the eight-week waiting period (Landström & Örténholm, 2016). Participants were also asked to fill out the Self-Compassion Scale-Short Form (SCS-SF; Raes, Pommier, Neff, & Van Gucht, 2011), which is a short version of the Self-Compassion Scale (SCS; Neff, 2003) as part of a predictor study connected to the larger Devin study (Skoglund & Trosell, 2016).

An external researcher independent to the study performed randomization through a random numbers generator (www.random.org), according to a 1:1 ratio. Participants were first randomized to either ICBT treatment condition ($n = 78$) or to an eight-week waitlist control condition ($n = 78$). After the first wave of treatment, participants on the

waitlist were then randomized to one of the two conditions: ICBT-RS ($n = 39$) or ICBT-SOR ($n = 39$). However following randomization, eight participants were lost prior to the pre-treatment assessment (see figure 2), leaving the total sample to be 70 participants, with 33 participants in ICBT-RS and 37 participants in ICBT-SOR.

The intervention

The element differentiating the two treatment conditions compared in this study was the amount of contact the therapist initiated with each participant. Participants allocated to ICBT-RS received regular feedback from their assigned therapist. Feedback was delivered to this group twice a week. In the middle of the week the therapist reviewed and gave feedback on the participant's progress so far and at the end of the week the therapist commented on the weekly exercises completed by the participant. In case of participant inactivity (> 1 week) they were sent a reminder to resume work. This was done primarily by e-mail or by a text message, and secondarily by telephone.

Individuals allocated to ICBT-SOR were at the onset of the treatment informed about the possibility of contacting their therapist at any time during the ongoing treatment. Thereafter, the therapists, except for the weekly emails informing about the availability of a new treatment module, initiated no further contact with these participants. Participants allocated to this condition who had not logged on to the treatment website during the first week of treatment were reminded to do so by their therapist by e-mail, text message or telephone. From then on, no further activity reminders were delivered during the duration of the treatment.

Some of the communication between therapists and participants was nevertheless the same for both conditions. Participants in both groups were at the onset of treatment sent an introductory message from their therapist. At the beginning of every new treatment week all participants were informed about the availability of a new treatment module by their therapist and at the end of treatment all participants received the same text file with the treatment material.

Therapists

Therapists in the study were five master's degree students in clinical psychology and four psychotherapist students from Stockholm University. All students had at least basic clinical training in CBT. The therapists received an introduction to the treatment program by Professor Per Carlbring, a licensed psychologist and psychotherapist, and Phd student Alexander Rozental, a licensed psychologist. Both have prior experience of working with ICBT. To ensure the quality of the treatment, Rozental gave one-hour weekly supervision sessions to the therapists in the study. Supervision was voluntary for the psychotherapist students. The therapists also received three one-hour supplementary supervision sessions via Skype by Professor Roz Shafran. Shafran is one of the authors of the treatment book "Overcoming Perfectionism" and has extensive clinical expertise in CBT-treatment of perfectionism and related conditions.

The number of participants allocated to each therapist varied from 2 to 16 and the therapists were recommended to spend approximately 15 minutes weekly on feedback for each participant (this applies to participants allocated to the ICBT-RS condition). The amount of time therapist spent on each participant, was however, not controlled for.

Correspondence with participants consisted primarily of lending support and encouragement, giving feedback on exercises, and responding to questions about the exercises or the treatment program.

Ethical considerations

The study was approved by the regional ethics board in Linköping (2015-419-31) and thereby fulfills requirements and ethical guidelines concerning research on humans. Participants were informed on the website that participation was voluntary and that they could discontinue their participation at any time. Participants also signed a written informed consent informing them that personal information would be handled according to Swedish law and the personal data act (SFS 1998:204).

All information in the study was handled with strict confidentiality. To secure anonymity, participants each received an automatically generated study code. These study codes were also used when analyzing the material. Personal information such as e-mail addresses and telephone numbers were saved on the study website via an encrypted system. Participants were also informed via the website of the possibility of creating an encrypted e-mail address. Personal information that was not saved on the study website, such as protocols used during the clinical interview were stored in a locked space. The treatment program was accessed through a two-step login, demanding both a personal password and a temporary code sent via SMS.

Concerning potential risks associated to the treatment being conducted via Internet no likely risks or disadvantages associated to participating in this study were expected. Because of the difference in the amount of feedback and support participants received during treatment depending on treatment allocation, it is plausible that personal experiences of the treatment may have varied between the groups. However the absence of regular support was not predicted to cause any particular disadvantages or put participants in ICBT-SOR at risk for negative effects.

Statistical analysis

Statistical analyses were conducted with IBM SPSS Statistics, version 22. Two tailed independent samples *t*-tests and Pearson χ^2 -tests were used to compare the two treatment conditions regarding sociodemographic variables and severity on scales for perfectionism and other clinical questionnaires at pre-assessment (screening and pre-treatment). Two tailed independent samples *t*-tests and Pearson χ^2 -tests were used to detect possible differences regarding missing data, adherence and satisfaction. Number of completed exercises was calculated, as well as the amount of opened modules, for all participants. Number of messages sent to assigned therapists via the treatment portal was also calculated for each participant and two tailed independent samples *t*-tests were used to check for differences between the two groups.

The eight participants, who had been lost prior to pre-treatment assessment but were by human error still randomized to a treatment group, were not included in the statistical analyses for calculating the main treatment effects. In total 70 participants were included in these statistical analyses (ICBT-RS $n = 33$, ICBT-SOR $n = 37$). A mixed-effects model was used to analyze the results on primary and secondary outcome measures. For the purpose of detecting possible differences between the two conditions

(ICBT-RS vs. ICBT-SOR), Time x Group interaction effects were modeled and analyzed. The two treatment conditions constituted the fixed effects. A Bonferroni correction post-hoc test was used to correct for multiple comparisons.

A mixed-effects model provides flexibility regarding modeling time effects and handling missing data (Gueorguieva & Krystal, 2004). In other words, it enables for analysis to be conducted on all randomized participants regardless of finalization of treatment, a so-called Intention-To-Treat analysis (ITT) (Gueorguieva & Krystal, 2004). Missing data in the study was handled with maximum-likelihood estimation. The goal of this method according to Enders (2010) “(...) is to identify the population parameters that have the highest probability of producing the sample data” (p. 84).

Effect sizes (Cohen's *d*) were calculated for between- and within group effects. Between-groups effect sizes were calculated by comparing means acquired at post-assessment for the two treatment conditions. Within-group effect sizes were calculated for both treatment conditions by comparing means attained at pre-assessment (screening) and post-assessment. The pooled standard deviation was used as the standardizer for both conditions (Cumming, 2014). Cohen's (1992) guidelines were used for comparing between group effect sizes recommending that an effect size of 0.20 can be interpreted as an indicator of a small effect, 0.50 of a moderate and 0.80 and over as a large effect size.

Clinical significant change was calculated for the primary outcome measure FMPS CM, as this was the only primary outcome measure for which there existed a pre-defined value, which could be used for this calculation. One way of calculating clinical significant change is to employ normative data (Jacobson & Truax, 1991). Based on recommendations by Shafran, a value of < 29 points (Suddarth & Slaney, 2001), was employed for this purpose. The concept of clinical significant change, as illustrated by Jacobson and Truax (1991), assumes that a patient who belongs to a dysfunctional population when entering treatment will no longer adhere to this population when finalizing treatment if a clinically significant change has taken place.

Clinical significant change together with Reliable change index (RCI) was used to determine rates of improvement (Jacobson & Truax, 1991). RCI is the difference between pre- and post scores divided by the standard error of measurement (Jacobson, Follette, & Revenstorf, 1984). A score of reliable change exceeding the value of 1.96 indicates that real change has taken place and the individual has moved either in the direction of function or dysfunction (Jacobsen et al., 1984). Reliable deterioration is when RCI exceeds 1.96 but in the direction of dysfunction (Jacobsen et al., 1984). Participants that were considered improved after treatment had a post-assessment score on the FMPS CM below the pre- defined cut-off value (< 29 points), and had achieved a reliable change on the same measure according to the RCI. Pearson's χ^2 -tests was used for comparisons between groups for the FMPS CM on improvement rates.

Results

Enrollment and attrition

An independent samples *t*-test and Pearson χ^2 -test revealed no differences between initial dropouts ($n = 8$) and participants included in the study ($n = 70$), regarding sociodemographics and scores on primary and secondary outcome measures at pre-assessment (screening). Of the 70 participants included in the study, 14 participants ($n = 7$, ICBT-RS; $n = 7$, ICBT-SOR) did not complete the post-treatment assessment and dropped out during the course of treatment. Pearson χ^2 revealed no differences between groups regarding the completion of treatment. No differences were obtained on sociodemographic variables between those who had completed post-assessment ($n = 56$) and those who had not ($n = 14$).

With an independent sample *t*-test, a difference was however obtained for one of the measures of perfectionism. At the second pre-assessment (pre-treatment assessment) a significant difference on CPQ was found between those who had completed post-assessment and those who had not, $t(67) = -2.92, p < .01$. These results could indicate that participants who did not complete the post-assessment had a slightly elevated level of perfectionism when entering treatment in comparison to the group who had completed the post-assessment. With a Bonferroni correction this finding was however not significant. No significant differences were found on the other outcome measures comparing completers to non-completers. For the two treatment conditions (ICBT-RS and ICBT-SOR), no differences were obtained concerning age and severity on the outcome measure at pre-assessment (screening), $t(68) = -1.04$ to $0.73, p = .30-.81$, as well as for sociodemographic variables, $\chi^2(2, 10) = 0.19 - 14.97, p = .10-.93$.

Primary and secondary outcome measures

Descriptive statistics at screening and pre-treatment assessment with estimated means and standard deviations for post-assessment on all outcome measures are provided in Table 3. A mixed-effects model analysis revealed a main effect of Time for primary outcome measures FMPS CM, FMPS PS, and CPQ for both conditions $F_s(2, 198) = 14.20-41.85, p < .001$. A main effect of Time was also found for secondary outcome measures for both conditions on DAS-40, GAD-7, and BBQ $F_s(2, 195-198) = 8.49-31.24, p < .001$, and PHQ-9 $F(2, 195) = 5.52, p = 0.0045$. No effect of Time was detected during the waiting period between screening and pre-treatment assessment.

The two treatment conditions were also compared to detect Time x Group interaction effects. The results of the mixed model did not reveal any differences for the ICBT-RS and ICBT-SOR conditions on either primary or secondary outcome measures, $F_s(1, 195-198) = 0.00-2.29, p = .13-1.00$. Based on the mixed model analysis, results indicated that both treatment conditions may have had an effect on treatment outcome and that no significant differences between them could be detected.

Effect sizes for within and between groups with *d* and 95% Confidence Intervals (CI) are provided in Table 4. Between-group effect sizes on primary outcome measures comparing ICBT-RS to ICBT-SOR varied from indistinguishable on the FMPS PS to small on FMPS CM. On secondary outcome measures, effect sizes ranged from barely indistinguishable on the GAD-7 to small on BBQ. Hence, the average effect sizes when

comparing the two treatment conditions were small to barely indistinguishable. Within-group effect sizes were considerably larger.

Table 3
Estimated Means, Standard Deviations, and Sample Sizes for Each Measure by Condition Over Time (ICBT-RS=33, ICBT-SOR=37), Using Intention to Treat Analysis

Measure and condition	Screening		Pre		Post	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
FMPS						
Concern over mistakes subscale						
ICBT-RS	35.79	6.74	35.06	8.63	25.79	7.69
ICBT-SOR	34.81	5.92	34.11	6.82	27.32	7.73
FMPS						
Personal standards subscale						
ICBT-RS	28.79	4.13	28.39	5.53	24.68	4.85
ICBT-SOR	28.08	4.10	27.97	4.35	24.55	4.88
Clinical Perfectionism Questionnaire						
ICBT-RS	38.48	4.21	38.15	5.14	29.93	5.81
ICBT-SOR	38.00	4.98	37.61	5.29	30.97	5.85
Dysfunctional Attitude Scale						
ICBT-RS	174.48	35.61	177.52	38.65	128.46	38.94
ICBT-SOR	180.05	28.50	174.31	33.98	138.10	38.38
Patient Health Questionnaire 9-Item Scale						
ICBT-RS	10.15	6.10	9.12	6.16	5.65	6.50
ICBT-SOR	9.43	4.98	8.97	6.42	7.27	6.41
Generalized Anxiety Disorder 7-Item Scale						
ICBT-RS	9.61	5.21	7.45	5.45	4.89	5.71
ICBT-SOR	8.30	5.32	7.08	5.61	4.93	5.63
Brunnsviken Brief Quality of Life Scale						
ICBT-RS	43.64	14.14	46.88	13.67	56.89	17.73
ICBT-SOR	40.86	19.10	44.89	17.79	51.07	17.84

Note. Pre= Pre-treatment assessment, Post= post-treatment assessment. ICBT-RS= ICBT Regular support; ICBT-SOR = ICBT Support on request

Table 4
Within- and Between-Group Effect Sizes Cohen's d [95% CI], for Each Outcome Measure, Using Intention to Treat Analysis

Measure and condition	Effect sizes [CI pre, post] within	Effect sizes [CI] between
FMPS		
Concern over Mistakes	1.38 [0.83, 1.90]	0.20 [-0.27, 0.67]
ICBT- RS	1.09 [0.59, 1.56]	
ICBT- SOR		
FMPS	0.91 [0.40, 1.41]	0.03 [-0.44, 0.50]
Personal Standards	0.78 [0.30, 1.25]	
ICBT- RS		
ICBT- SOR		
Clinical Perfectionism Questionnaire	1.69 [1.11, 2.23]	0.18 [-0.29, 0.65]
ICBT- RS	1.29 [0.78, 1.78]	
ICBT- SOR		
Dysfunctional Attitude Scale	1.23 [0.69, 1.74]	0.25 [-0.22, 0.72]
ICBT- RS	1.24 [0.73, 1.72]	
ICBT- SOR		
Patient Health Questionnaire 9-Item Scale	0.71 [0.21, 1.20]	0.25 [-0.22, 0.72]
ICBT- RS	0.38 [-0.09, 0.83]	
ICBT- SOR		
Generalized Anxiety Disorder 7-Item Scale	0.86 [0.35, 1.36]	0.01 [-0.46, 0.48]
ICBT- RS	0.62 [0.14, 1.07]	
ICBT- SOR		
Brunnsviken Brief Quality of Life Scale	0.83 [0.31, 1.32]	0.33 [-0.15, 0.80]
ICBT- RS	0.55 [0.08, 1.01]	
ICBT- SOR		

Note. ICBT-RS= ICBT Regular support; ICBT-SOR = ICBT Support on request

Clinical Significant Change

Improvement rates were calculated for the FMPS CM subscale. Of the total number of participants who filled out the post-assessment, 28 participants (40.0%) improved on the FMPS CM. See Table 5 for improvement rates. No differences were found between the treatment conditions on improvement ratings, $\chi^2(1) = 0.14, p = .71$. Concerning rates of reliable deterioration, only one participant fulfilled requirements. Of interest may be that this participant had only opened one treatment module during the course of the treatment period.

Table 5
Improvement and deterioration rates for FMPS CM.

	Improved	Deteriorated
ICBT- RS	14 (42.4%)	0 (0.0%)
ICBT- SOR	14 (37.8%)	1 (2.7%)
Total	28 (40.0%)	1 (1.4%)

Note. FMPS CM = Frost Multidimensional Perfectionism Scale, Concern over Mistakes subscale. ICBT-RS= ICBT Regular support; ICBT-SOR = ICBT Support on request.

Adherence and Satisfaction with treatment

A full account of opened modules in total and for each treatment condition is provided in Table 6. The mean number of modules opened by each participant was 5.39 modules ($SD = 2.88$). Indicating that the participants took part of approximately two thirds of the treatment program during the treatment period (ICBT- RS: $M = 5.82$, $SD = 2.89$; ICBT-SOR: $M = 5.00$, $SD = 2.86$). An independent samples t -test revealed no difference between the treatment conditions concerning the number of treatment modules opened, $t(68) = 1.19$, $p = 0.24$.

Five participants in total had not opened any of the treatment modules during the course of treatment (ICBT-RS = 2; ICBT-SOR = 3). In total 51 participants (72.9%) had opened at least half of the treatment modules (i.e. 4 modules), including 25 people in ICBT-RS (75.8%) and 26 people in ICBT-SOR (70.3%). On average 39 participants (55.7%) had opened at least three quarters of the modules, that is six modules (75%). This included 22 participants from ICBT- RS (66.7%) and 17 participants from ICBT-SOR (45.9%).

Average number of completed exercises in total was 17.77 ($SD = 10.78$). Divided by groups these numbers were $M = 19.61$ ($SD = 11.01$) for ICBT- RS, and $M = 16.09$ ($SD = 10.45$) for ICBT-SOR. These numbers indicate that the participants completed a little more than half of the total number of exercises included in the study ($n = 33$). An independent samples t -test revealed no differences between the treatment conditions concerning the number of exercises completed, $t(63) = 1.32$, $p = .19$.

Ratings of overall “satisfaction” with the treatment were reported on a scale ranging from 1-4 (“not at all pleased” to “very pleased”) and analyzed for all participants who filled out the post-assessment. On average, the treatment was rated as “mostly satisfying” (Total: $M = 3.02$, $SD = 0.86$; ICBT- RS: $M = 3.27$, $SD = 0.87$; ICBT-SOR: $M = 2.80$, $SD = 0.81$). An independent samples t -test revealed a difference between the treatment conditions regarding the overall rating of satisfaction $t(54) = 2.09$, $p = 0.04$, possibly indicating that participants in the ICBT-RS condition were slightly more pleased with the treatment than participants in the ICBT-SOR condition.

Therapist contact

A total of 25 people (75.8%) in ICBT-RS had sought contact with their therapist during the treatment period in comparison to 10 people (27%) in ICBT-SOR. The average

number of messages sent by participants to assigned therapists during the treatment period was 1.27 ($SD = 2.04$). For each treatment condition the numbers were $M = 2.33$ ($SD = 2.53$) for ICBT-RS, and $M = 0.32$ ($SD = 0.58$) for ICBT-SOR. An independent samples t -test revealed a difference between the treatment conditions regarding the number of messages sent, $t(35) = 4.45$, $p < .001$. Suggesting that participants allocated to ICBT-RS sent more messages to their assigned therapists during the treatment period than participants allocated to ICBT-SOR. Note that only messages sent through the treatment portal were counted. This means that messages sent to the external e-mail account were not included in this analysis.

Table 6

Number of modules opened in total and for each treatment condition with percentages in brackets.

Opened modules	Total $n = 70$ (%)	ICBT-RS $n = 33$ (%)	ICBT-SOR $n = 37$ (%)
1 module	65 (92.9)	31 (93.9)	34 (91.9)
2 modules	58 (82.9)	28 (84.8)	30 (81.1)
3 modules	55 (78.6)	26 (78.8)	29 (78.4)
4 modules	51 (72.9)	25 (75.8)	26 (70.3)
5 modules	43 (61.4)	23 (69.7)	20 (54.1)
6 modules	39 (55.7)	22 (66.7)	17 (45.9)
7 modules	37 (52.9)	20 (60.6)	17 (45.9)
8 modules	29 (41.4)	17 (51.5)	12 (32.4)

Note. ICBT-RS= ICBT Regular support; ICBT-SOR = ICBT Support on request.

Discussion

To the author's knowledge this is the first RCT comparing ICBT with regular support to ICBT with support on request in an eight-week treatment of perfectionism with a self-referred sample. The assumption that an Internet-based treatment for perfectionism with regular support or support on request would render statistically significant pre-post reductions on primary outcome measures of perfectionism, as well as for secondary outcome measures of anxiety, dysfunctional attitudes, depression, and an increase in quality of life was satisfied. These findings are in line with previous studies on perfectionism indicating that CBT interventions may be successful in treating perfectionism and reducing symptoms of comorbid conditions (Lloyd et al., 2015), as well as increasing quality of life (Handley et al., 2015).

Against expectations, the results of the mixed model did not reveal any differences on primary or secondary outcome measures when comparing the two treatment groups. Between-group effect sizes ranged from barely distinguishable to small for primary outcome measures, as well as for secondary outcome measures. However a minor trend towards larger within group effect sizes could be detected for ICBT-RS. The two treatment conditions did not either differ on adherence, attrition or rates of

improvement. Differences between the two treatment conditions were obtained for overall satisfaction with the treatment, in favor of ICBT-RS. Participants in ICBT-RS also sent more messages to their assigned therapist in comparison to participants in ICBT-SOR.

Discussion of the main findings

The main finding that the presence of regular guidance did not differentiate the two groups regarding treatment outcome resembles findings from other studies comparing guided to unguided treatments, as well as studies including a guidance on request condition (Berger et al., 2011a; Berger et al., 2011b; Furmark et al., 2009). The findings can also be compared to results from other treatment studies of perfectionism, suggesting the possibility of treating perfectionism in a self- help format with or without guidance (Egan et al., 2014b; Pleva & Wade, 2006).

The findings from this study are however not in line with meta-analysis and reviews suggesting that guided treatments are favorable to unguided treatments (e.g. Andersson & Cuijpers, 2009; Baumeister et al., 2014; Richards & Richardson, 2012; Spek et al., 2007). However, there are some limitations associated to these studies, which should be mentioned. A general limitation to these meta-analyses and reviews concern the heterogeneity of the studies included. As Richards and Richardson (2012) noted, the guided and unguided studies included in these meta-analyses may have also differed on variables other than treatment support. For example, different intervention elements may have been included in different studies (Richards & Richardson, 2012). Another issue complicating the comparability of the findings from these meta-analyses to the current study concerns the populations studied, and that they have not focused on perfectionism. Furthermore these studies have compared guided to unguided treatments and it may be questioned if ICBT-SOR is comparable to pure unguided treatments. Since participants in ICBT-SOR were allocated a personal therapist who they could contact at any time requesting support. Thus, the applicability of these findings to the current study can be questioned. The findings from this study nevertheless raise several questions, such as possible similarities and differences between the two treatment conditions, and what factors in the treatment may have been beneficial for the treatment group without regular support (ICBT-SOR).

Rates of attrition

High dropout rates have previously been mentioned as a problem with unguided treatments (Andersson et al., 2015). In a meta-analysis by Richards and Richardson (2012) dropout rates of 74% were reported for unguided treatments for depression. For therapist-supported treatments the percentage was 28% (Richards & Richardson, 2012). In comparison to these numbers dropout rates in this study were lower, especially when compared to the pure unguided treatments for depression. In this study a total of 20% of the participants did not complete the post-assessment, and no difference was found between the two conditions.

Rates of attrition in this study may be compared to other ICBT trials on perfectionism. Pleva and Wade (2006) reported a 20.4% dropout rate and Egan et al. (2014b) a 25% dropout rate, with no difference between the face-to-face and the self-guided Internet-

based treatment. Hence, dropout rates in this study appear to be comparable to levels obtained in similar treatment studies targeting perfectionism.

Clinical significant change

Regarding rates of clinical significant change and improvement ratings, no differences were obtained between the two groups. Furthermore, only one participant fulfilled requirements for reliable deterioration. Rates of clinical significant change in this study are comparable to other treatment studies targeting perfectionism, and they resemble rates of improvement reported in the study by Pleva and Wade (2006). In comparison to the study by Egan et al. (2014b) and the pure self-help condition evaluated, rates of improvement in this study appear to be somewhat larger. However due to different study designs and methodological issues related to calculating clinical significant change, these comparisons are best understood as possible indications of how improvement rates in this study relate to other trials.

Comparing rates of improvement across studies is complicated in that different methods have been used to calculate clinical significant change. In this study a predefined value (>29) was used as the mean of the normal population, based on recommendations by Shafran. This value came from a study that had examined a group of college students on measures of perfectionism (Suddarth & Slaney, 2001). However, due to the lack of norms for levels of clinical perfectionism, there is no consensus regarding what values to use for calculating clinical significant change. It is therefore possible that different values have been used in different studies. The usage of different cut-off values will affect how many participants are considered improved in different studies, further complicating comparisons across studies.

In addition to the above-mentioned problems related to calculating clinical significant change, it should also be noted that clinical significant change in this study, could only be calculated on post-assessment data retrieved. Neither rates of improvement nor deterioration could therefore be calculated for participants not completing the post-assessment. It is therefore possible that the values obtained may not be representative for the actual number of improved or deteriorated participants in this study.

Adherence and satisfaction

Adherence in the form of number of treatment modules opened and number of completed exercises did not differ between the treatment groups, although there was a tendency towards somewhat larger adherence in ICBT-RS. Levels of adherence for ICBT-RS in this study are somewhat lower but comparable to levels found in a meta-analysis on adherence in ICBT for depression. Van Ballegooijen et al. (2014) reported that 67.5% of the participants in guided ICBT for depression completed 80% of the treatment. Levels of adherence for ICBT-SOR in this study were somewhat lower in comparison. Still no significant differences were obtained between ICBT-RS and ICBT-SOR. On this point, the findings differ from the study by Pleva and Wade (2006) that reported a significant difference between the guided and pure self-help condition, in favor of the guided condition.

Regarding adherence in this study, it is notable, that a total of five participants did not open any of the treatment modules. This may be due to the design of the study and the

waiting period before the participants started treatment. It is possible that this could have affected participant's motivation to partake in treatment.

With regard to the intervention evaluated in this study and the design of the Devin treatment, there are several factors that could have had a positive influence on adherence in ICBT-SOR. These include the reminders in the form of weekly automatic messages that all participants received from their therapists. Automated reminders have in a previous study been suggested to improve adherence in a unguided treatment (Titov, Andrews, Choi, Schwencke, & Johnston, 2009). Furthermore, it is also possible that the presence of a deadline including a time frame in which all participants were expected to have completed the treatment in order to access therapist support, could have functioned as a motivating factor for participants in ICBT-SOR, possibly prompting them to finish the treatment in time.

An interesting finding regarding the satisfaction ratings was that participants allocated to ICBT-RS seemed to be slightly more satisfied with the treatment than participants in ICBT-SOR. Yet, there were no significant differences on treatment outcome between the two. It is possible that the prevalence of regular support may not have been crucial for treatment adherence nor improvement over time, however it may have influenced the participants personal experiences of the treatment. If and how these different experiences of the treatment program will affect participants at a later stage cannot be known. Nevertheless, the possibility of this causing negative effect of some sort is unlikely considering that both groups still reported that they were satisfied with the treatment.

Rates of satisfaction in this study should nevertheless be interpreted with some caution. Due to that they were calculated on basis of the answers retrieved, consequently not including answers from participants who had not completed the final assessment. For that reason it is possible that these scores may have overestimated the obtained ratings of satisfaction. Furthermore, there is also a risk that these ratings might have been subjected to social desirability. Since participants may have not wanted to rate the treatment badly in case of a therapist seeing this.

Therapist contact

There was a difference in the amount of therapist support requested when comparing the two treatment groups. A majority of the participants in the ICBT-SOR did not seek additional contact from their therapist during the treatment period. Whereas opposite findings were observed in the ICBT-RS condition, where a majority of the participants did seek additional support. However, there are issues related to how these results were obtained, complicating interpretations. Comparing these two conditions may be misleading since participants allocated to ICBT-RS received regular support from their therapists through feedback on their homework assignments. Some of the messages sent from participants in ICBT-RS could therefore have been response to the feedback they had received from their therapist. In these cases, the participant did not initiate these messages. As participants in ICBT-SOR did not receive regular therapist guidance they initiated the messages they sent. With regard to the uncertainty of these calculations, the mean values of sent messages for each group still might say something about the comparably little amount of therapist support participants in ICBT-SOR requested.

The amount of therapist contact requested in this study can be compared to findings from the study by Berger et al. (2011b). The proportion of participants seeking additional therapist support was considerably larger in the Berger et al. (2011b) study. However there are important differences between the studies. In the treatment study by Berger et al. (2011b), participants were automatically asked at the end of each session if they wished to receive additional support. It is possible that this might have had a positive influence on the participants' behavior to seek supplementary contact during treatment. If participants in ICBT-SOR in this study had been regularly reminded of the possibility of contacting their therapist, it is imaginable that they would have sought more contact. A limitation to this study is that participants were not asked at post-assessment why they did not seek additional support. However, since very few trials have evaluated a support on request condition little is known about how this type of treatment works. It is conceivable that for participants in ICBT-SOR, just knowing that they could seek therapist contact at any time, could have had a positive influence on their motivation to work on treatment and they may have therefore not felt the need to seek additional contact.

Further reflections on the findings

Another factor that may have had a positive impact on the course of treatment for participants in ICBT-SOR has to do with the initial assessment, and the screening for the study. Even though many of the participants in ICBT-SOR had not sought additional therapist support during the treatment period, they were not without any therapist contact during the whole course of the study. The initial screening interview could have served as one form of personal contact between therapists and participants. Boettcher, Berger and Renneberg (2012) suggest that a pre-treatment interview may improve adherence in Internet-based treatments. Marks and Cavanagh (2009) have proposed that a minimal amount of informed contact can have a positive impact on the continuation and progress for patients in Internet-based treatment. Hence, this initial communication between participant and therapist could have had a positive influence on treatment adherence for participants allocated to ICBT-SOR. Furthermore, screening interviews serve important functions in Internet-based treatments in that they assess participants' eligibility and suitability for the treatment, factors that are considered important for treatment outcome (Andersson et al., 2009; Marks & Cavanagh, 2009).

The unexpected finding that there was no difference between the two groups on treatment outcome may be understood in relation to the participants included in this study. It is possible that people with problems related to clinical perfectionism, in comparison to people seeking help for other conditions, could be more inclined to adhere to a treatment program and work independently. Core aspects of clinical perfectionism, such as a strong fear of failure and a tireless strive to succeed could play a part in this. Nevertheless other aspects related to clinical perfectionism, such as a tendency to procrastinate or avoid anxiety-provoking situations, might however suggest the opposite. A more plausible explanation to the findings may be that self-referred participants might require less treatment support and be more apt to undergo and benefit from an Internet-based treatment without regular support, in comparison to participants referred from a clinic with potentially more severe problems. Furthermore, it is also possible that self-referred participants may be more motivated to change.

Methodological considerations

Outcome measures

Primary outcome measures were chosen on the basis of that they measured clinical perfectionism, as defined by Shafran et al. (2002). A potential issue concerning the external validity of this study is that the primary outcome questionnaires in their original forms are based on different conceptualizations of perfectionism. FMPS reflects a multidimensional view on perfectionism (Frost et al., 1990), whereas CPQ is derived from the clinical cognitive behavioral model of perfectionism (Egan et al., 2016). For this reason only the subscales CM and PS from FMPS were used, since they are considered to reflect the concept of clinical perfectionism (Riley et al., 2007). Findings from a study by Stoeber and Damian (2014) suggests that CPQ correlates with the two FMPS subscales, which supports the possibility of using these three measures to assess clinical perfectionism.

The secondary measures used in this study were chosen on the basis that they assessed symptoms of psychiatric conditions linked to clinical perfectionism, such as depression and anxiety. PHQ-9 and GAD-7 are two easily available, short measures, with good psychometric properties (Kroenke et al., 2001; Spitzer et al., 2006). In addition to this, DAS was used as a complementary measure of depression, assessing cognitive aspects related to depression (Weissman & Beck, 1978). Furthermore, measures of quality of life are considered to be a useful complement to regular symptom ratings (Lindner et al., 2016). The usage of a quality of life scale, BBQ, was therefore considered a valuable addition to the other measures included in this study.

Issues of reliability may be relevant to mention in relation to a discussion of the outcome measures, since some of the measures included in this study have uncertain psychometric properties. This includes the primary outcome measure of CPQ. The internal consistency for CPQ in the Devin study was marginal, causing some insecurity regarding its reliability. The internal consistency for FMPS PS in this study was also marginal, and lower than previously reported (e.g. Steele et al., 2013), which is also reason to be a little bit cautious when interpreting the findings.

Internal validity

The design of this study as a randomized controlled trial is an advantage, as it enables control over the independent variable (Kazdin, 2014). An issue related to the study design and the internal validity of this study, concerns the distribution of outcome measures. The current study consisted of a number of different questionnaires which participants were asked to fill out at three different time points. It is possible that participants may have grown tired of answering questions during this time, possibly influencing the manner in which they filled out the questionnaires, creating uncertainty in their answers.

Another issue regarding the internal validity of this study concerns randomization. At randomization eight participants were by mistake allocated to a treatment group, when they should have been excluded. Subsequently this created unequal sample groups. The difference in sample size between the two groups was nevertheless small and no differences were obtained when comparing the two groups with independent samples t-

test and Pearson χ^2 . The fact that these participants were not included in the statistical analyses still raises the question of attrition bias. However, because these participants had been incorrectly randomized, including them could have further distorted the results of this study. Due to that these participants were not intending on receiving treatment and had dropped out of treatment prior to being informed about what treatment condition they had been allocated to. Hence, information on treatment allocation (ICBT-RS or ICBT-SOR), would not have affected their decision to drop out of treatment, therefore not threatening the ITT-analysis.

External validity

A complicating matter for this study and similar studies concerning perfectionism is the lack of clear guidelines for assessing clinical perfectionism. Hence, there are no agreed upon cut-off scores on questionnaires assessing clinical perfectionism. This is an issue relating to the external validity of this study, which may have influenced the screening process conducted at Linköping University. No predefined cut-offs on primary outcome measures of perfectionism were used for inclusion in this study. However, measures were taken to ensure that participants included in the study, experienced problems related to clinical perfectionism, such as asking complementary questions about problems related to clinical perfectionism during the screening-interview. It is however possible, that some of the included participants may have not had problems primarily related to perfectionism. There is therefore a risk that some of the participants that were accepted in the study were not representative of people experiencing clinical perfectionism in general. This matter concerns the external validity of this study, and how well the results from this study may be generalized.

With regard to the issue of external validity, it may be helpful to compare participants in this study to participants in other CBT-P trials. Obtained mean pre-treatment scores for FMPS CM and FMPS PS in this study are similar to scores obtained in other perfectionism trials (e.g. Riley et al., 2007; Egan et al., 2014b). The mean pre-treatment score on CPQ in this study was, however, somewhat raised in comparison to the study by Egan et al. (2014b), but in line with Riley et al. (2007). These comparisons, despite their uncertainty, indicate that participants included in this study by means of scores on primary outcome measure resemble participants from other treatment studies of perfectionism. Another potential issue concerning external validity involves the difference in severity of perfectionism on CPQ between those who had completed the treatment and filled out the post-assessment, and those who had not. This difference could indicate that participants with elevated perfectionism on CPQ at treatment start were lost during treatment. However with a Bonferroni correction this difference was not significant.

The current study sample, composed of a group of self-referred participants may also limit the possibilities of generalizing the results of this study to pure clinical groups. Only a few participants had psychiatric diagnoses. Yet, due to the lack of clinical norms, it is still unclear who constitutes a clinical group of perfectionists. Hence, it is possible that participants in this study may have had problems related to perfectionism on a clinical level. Other sociodemographic characteristics affecting the generalizability of the findings concern the study sample that was predominantly composed of women (90%), and a majority of the participants (70%) had a university level degree. Since

prevalence of perfectionism in the general public is unknown, it's uncertain if these proportions are representative for the average population of people who experience problems related to clinical perfectionism. Still, it is not unimaginable that clinical perfectionism could be more prevalent within these groups. It could be that people, who experience problems related to perfectionism and have demanding personal standards, might be more inclined to finish a higher education. Furthermore it may also be that women more often than men may experience problems related to perfectionism. Possibly influenced by norms in society. However, in comparison to the general population, these percentages are not representative. Still, research has suggested that people with higher educations are more likely to require mental health care (Howard et al., 1996), including Internet-based care (Andersson & Titov, 2014).

Aspects of the statistical analysis

Regarding the choice of method for statistical analysis, a mixed model was chosen with an intention to treat principle, due to the advantages of handling missing data with this method (Gueiorguieva & Krystal, 2004). A possible alternative method could have been to employ an repeated-measures ANOVA. However there are issues regarding the handling of missing values with this method (Gueiorguieva & Krystal, 2004), that can potentially affect the validity of the analysis (Enders, 2010). Excluding participants with a likewise (complete-case analysis) or pairwise deletion risk the possibility of a serious loss in power (Enders, 2010). These methods also assume that data is missing completely at random, which can misconstrue parameter estimates when this requirement is not met (Enders, 2010). Despite randomization these methods therefore risk sample bias since participants not improving in treatment are likely to drop out of treatment (Gueiorguieva & Krystal 2004). A Maximum likelihood estimation was used in this study in that it does not risk bias and the loss of power to the same extent as other methods do (Enders, 2010).

A potential drawback to the use of a mixed model in this study is that there only were three measurement points and two of them were scheduled before the start of treatment. An optimal usage of the mixed model would have included several points of assessment during the treatment period. According to Hesser (2015), four different measurement points during treatment is generally recommended. It is therefore possible that the limited amount of measurement points in this study could have influenced the flexibility in which the mixed model worked in this study. However in consideration to the mentioned advantages with a mixed model regarding the handling of missing data, it was still considered the most appropriate statistical method available.

Study limitations

The findings should be interpreted with respect to the limitations of the study. These concern matters of validity and reliability previously discussed, as well as other issues related to the design of the study. One limitation of this study is the absence of a waitlist condition. This is due to the design of the larger Devin study, as this study focused on participants allocated to the second wave of the treatment study. Due to this design potential effects over time could not be accounted for when looking at changes for each group separately. Also, maintained treatment effects could be inquired due to the absence of a follow-up assessment.

Regarding the limitations of this study, the within group effect sizes reported should be interpreted with particular caution. Since within group effect sizes calculated with the standardized mean difference (SMD) for pre-post assessments are uncontrolled and risk bias (Cuijpers, Weitz, Cristea, & Twisk, 2016). According to Cuijpers et al. (2016) changes observed cannot be securely attributed to the treatment as they might be explained by other factors such as natural recovery. Scores at pre- and post-assessment are not either independent of each other. Comparing SMD for pre-post assessments across studies therefore poses complications, as these estimates are sensitive to the impact of different study specific variables (Cuijpers et al., 2016).

The absence of a control group may therefore limit what conclusions can be drawn regarding the efficacy of the treatment. Nevertheless since this study constitutes the second wave of the larger Devin study, results from the first wave might be taken into consideration. In Roos and Thelanders study (2016), significant changes on measures of perfectionism and depression, anxiety and quality of life were reported in comparison to a waitlist-control condition, suggesting the potential of treating perfectionism with the Devin treatment program.

Another potential limitation to this study is the sample size as it risks being somewhat underpowered for detecting differences on between group effects. To obtain acceptable power, RCTs comparing active treatments generally require large sample sizes to not risk type II error (Mohr et al., 2009). However the sample size in this study could not be augmented due to the study design of the larger Devin study. A power analysis would therefore not have affected the sample size of this study.

With a mixed model analysis therapist specific effects could also have been explored. It is possible that there may have been a variation in how communication with participants was conducted by different therapists. It is furthermore also possible that therapists may have spent a different amount of time giving feedback to participants. A potential drawback is that this was not controlled for. Still, regular supervision ensured that a common approach was adopted among therapists in the way feedback was delivered. Therapist-specific effects were nevertheless considered unlikely since feedback was generally limited in nature focusing on the treatment interventions presented in the modules.

Clinical implications and future research

Clinical implications drawn from this study should be made with respect to the limitations discussed. While taking these restrictions into account the results of this study may suggest that ICBT with support on request might be considered an alternative to guided ICBT for treating perfectionism. With reference to prior research on ICBT for other clinical conditions, it seems that some amount of therapist contact during the course of treatment is nevertheless of importance (e.g. Marks & Cavanagh, 2009). Still much is left to discover regarding possible mechanisms and processes of change in Internet-based treatments. This is proposed as a question to be further addressed in future research. Furthermore, this study also raises questions regarding what patients are best suited to undergo Internet-based treatment, especially with minimal therapist support. Other important questions are how best to prevent dropout and increase adherence in ICBT.

ICBT treatments come with many advantages; one of them is being able to reach more people with evidence-based care (Andersson et al., 2013). Unguided Internet-based treatments have the possibility of further increasing the accessibility to evidenced-based care (Karyotaki et al., 2016). Treatments with the possibility of requesting therapist could be a possible alternative to these two forms of ICBT. However more studies are needed that compare guided ICBT to ICBT without regular support, but with the possibility of requesting support. A possible usage for ICBT with support on request could be as an early treatment intervention for mild and subclinical conditions or for other clinical problems such as perfectionism.

Research has suggested that perfectionism can cause personal distress on its own as well as hinder treatment of Axis I disorders (Shafran et al., 2016). The development of effective treatment interventions could therefore be of great value for the mental healthcare system. With cautious optimism these findings suggest the possibility of treating perfectionism with ICBT either with or without support. More research is however needed, preferably with larger samples, where ICBT for perfectionism is evaluated and compared to other active treatments.

Conclusion

Findings from this study provide preliminary evidence suggesting that ICBT for perfectionism developed by Shafran et al. (2010), but adapted to Swedish conditions, may be successful in treating perfectionism with regular support or with support on request. The results of this study indicate improvements for both treatment groups on measures of perfectionism as well as for symptoms of anxiety, depression, and dysfunctional attitudes in addition to quality of life following treatment. These findings are in line with prior research suggesting that CBT- interventions targeting perfectionism not only reduce perfectionism but also have an impact on symptoms of depression and anxiety (Lloyd et al., 2015). Several possible explanations have been discussed in relation to the unexpected finding that no significant difference was found between ICBT-RS and ICBT-SOR on treatment outcome. These include the importance of an initial screening interview, automated emails, a deadline for treatment termination, and being able to contact a therapist at any time. The function of therapist contact in ICBT is suggested to be an area for further inquiry in future research.

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