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Treating perfectionism via the Internet: a randomized controlled trial comparing cognitive behavior therapy to unified protocol

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ABSTRACT

Perfectionism can be problematic when your self-worth is dependent on achievements and leads to inflexible standards, cognitive biases, and rigid behaviors. Cognitive behavior therapy for perfectionism is shown to be effective, including for targeting psychiatric symptoms and when delivered via the Internet (iCBT-P). However, few studies have compared it to an active comparator. The current study randomly assigned 138 participants seeking help for perfectionism to iCBT-P or Internet-based Unified Protocol (iUP). Both treatments provided guidance on demand from a therapist and were eight weeks in duration. The results indicated large within-group effects of Cohen's *d* 2.03 (iCBT) and 2.51 (iUP) on the Clinical Perfectionism Questionnaire at post-treatment, and maintained effects at 6- and 12-month follow-up, but no between-group difference ($\beta = 0.02$, $SE = 1.04$, $p = .98$). Secondary outcomes of depression, anxiety, quality of life, self-compassion, procrastination, and stress ranged from small to large, with no differences between the conditions. Both treatments were deemed credible, relevant, of high quality, and well-adhered by the participants. Further research needs to be conducted, but the findings could indicate a lack of specificity, perhaps suggesting there is no need to differentiate between different treatments that are transdiagnostic in nature.

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Introduction

Setting high standards for yourself and striving for excellence can be desirable traits and linked to many positive outcomes in life. However, when these ambitions are

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characterized by excessiveness and self-worth becomes dependent on achievements, they start taking their toll on your wellbeing. This is referred to as perfectionism, defined as “*the overdependence of self-evaluation on the determined pursuit of personally demanding, self-imposed standards in at least one highly salient domain, despite adverse consequences*” (Shafran et al., 2002, p. 778). It features two higher-order dimensions known as *perfectionistic strivings*, i.e. imposing far-reaching goals and basing your sense of value on attainment, and *perfectionistic concerns*, i.e. being overly concerned about making mistakes, doubting your own capacities, and criticizing yourself when standards are not being met (Stoeber & Gaudreau, 2017). Included in these dimensions are the interpersonal facets of perfectionism, as proposed by Hewitt and Flett (1991), which differentiates between self-oriented perfectionism (i.e. demanding perfection of yourself), socially prescribed perfectionism (i.e. the conviction that others require you to be perfect), and other-oriented perfectionism (i.e. urging others to be perfect). The interpersonal facets highlight the relational difficulties many individuals with high levels of perfectionism experience, such as fear of rejection, which make them particularly susceptible to psychological distress (see also Smith et al. (2022) for an overview of the multidimensional nature of perfectionism).

Perfectionism is correlated with numerous negative outcomes, including mental distress, suicidal ideation, exacerbation of somatic issues, and interpersonal difficulties (Egan et al., 2011; Limburg et al., 2017; Smith et al., 2018). From a clinical perspective, perfectionism is also related to poorer therapeutic alliance and problems adhering to treatment (Hewitt et al., 2020; Kobori et al., 2020). According to Shafran et al. (2023), perfectionism can be regarded as a transdiagnostic process that influences the development and maintenance of many diagnoses, such as eating disorders, making it an important aspect to address in psychotherapy. More specifically, perfectionistic concerns exhibit moderate correlations with symptoms of anxiety, depression, and obsessive-compulsive disorder, while perfectionistic strivings demonstrate small yet significant correlations with the same variables (Callaghan et al., 2023). Several studies have demonstrated that treating perfectionism not only results in less symptoms of perfectionistic standards and concerns, but also less symptoms of psychiatric disorders, giving some credence to the notion of perfectionism as an important mechanism to target even when it is not the main focus of treatment, e.g. depression (Galloway et al., 2021).

Cognitive behavior therapy for perfectionism

Shafran et al. (2002) put forward a cognitive behavioral (CBT) model that has been influential in understanding and treating perfectionism. At its core, perfectionism is characterized by a fear of failure and a relentless pursuit of success, which creates a situation where your self-worth is conditioned on achievements. Consequently, people with perfectionism develop standards that are highly inflexible (e.g. “I must always perform at my best”), which turns into a set of cognitive biases and rigid behaviors aimed at upholding these standards, e.g. dichotomous thinking (“it’s either perfect or worthless”) and constantly checking for errors (Egan et al., 2007; Yiend et al., 2011). Regardless of performance, a person with high levels of perfectionism will disregard any accomplishment as insufficient, leading to increased standards in the future, or, alternatively, interpret the end product as substandard or avoid the activity altogether, which

results in self-criticism and engagement in counterproductive behaviors such as procrastination (Riley & Shafran, 2005). In the end, self-evaluation keeps being determined by achievements, which makes your self-worth vulnerable and maintains the need to uphold your standards by rigid rules (Egan et al., 2013). Shafran et al. (2023) provides an overview on the development and research on the CBT model for perfectionism.

Based on the CBT model of perfectionism, Egan et al. (2016) created a treatment manual specifically tackling the issues facing those with elevated perfectionism. A self-help book based on the same outline has also been released (Shafran et al., 2018). This consists of providing psychoeducation on maintenance factors and creating an individualized conceptualization, expanding the domains for self-evaluation, testing beliefs and predictions, and addressing inflexible standards and self-criticism, including such interventions as behavioral experiments, cognitive restructuring, noticing positive evidence, and activity scheduling. Over the last two decades, several studies have investigated the efficacy of face-to-face CBT for perfectionism in individual (Egan & Hine, 2008) and group settings (Handley et al., 2015), with promising results. Meanwhile, administering treatment via the Internet has also been encouraging, both with guidance (i.e. regular contact with a therapist) (Rozental et al., 2017; Shafran et al., 2017), guidance on demand (i.e. contact with a therapist only when requested) (Zetterberg et al., 2019), or unguided (i.e. no guidance provided) (Wade et al., 2020). Meta-analytic findings of 15 identified studies indicate that compared to controls, CBT yields aggregated between-group effects on perfectionistic standards of Hedge's $g = 0.66$ (face-to-face) and 0.56 (self-help), and perfectionistic concerns of 1.29 (face-to-face) and 0.83 (self-help) (Galloway et al., 2021). In addition, CBT for perfectionism seems to have moderate effects on symptoms of depression, anxiety, and small effects eating disorders, despite the fact that these issues are not specifically targeted in treatment (Galloway et al., 2021). A meta-synthesis of qualitative studies also suggested that participants themselves perceive CBT to be helpful in managing their perfectionism, highlighting the importance of feedback, broadening the domains determining your self-worth, challenging all-or-nothing-thinking, and utilizing behavioral experiments (Egan et al., 2022).

However, it should be noted that CBT may not suit everyone or achieve positive outcomes on more trait-like features such as the interpersonal facets of perfectionism. In a systematic review and meta-analysis by Smith et al. (2023) only moderate effects were found for CBT on self-oriented perfectionism ($g = 0.60$), socially prescribed perfectionism (0.53), and other-oriented perfectionism (0.36), with no difference between treatment and control conditions. Meanwhile, interpersonal and psychodynamically oriented psychotherapies have demonstrated greater effects on these variables (Hewitt et al., 2015, 2023). One possible reason for this difference might be due to the nature and focus of the interventions in different treatments, with CBT usually putting greater emphasis on such aspects as beliefs and predictions in the maintenance of perfectionism.

Unified protocol

One limitation of previous research on CBT for perfectionism is that most randomized controlled trials (RCTs) have employed a passive (e.g. wait-list) comparator (Shafran et al., 2023). Although reasonable when testing the efficacy of a novel treatment, it also presents many limitations. For example, a waiting-list can inflate the between-group

difference when compared to treatment (Cuijpers & Cristea, 2016). Furthermore, comparing two treatment conditions against each other makes it easier to investigate factors affecting outcomes and adherence (Zipfel et al., 2020). Choosing a relevant active comparator can however be difficult (Goldberg et al., 2023). Gold et al. (2017) recommend “A treatment that has an evidence base to support its efficacy, but is different from the experimental treatment (eg, a different type of psychotherapy or a licensed drug)” (p. 726). Given that perfectionism constitutes a transdiagnostic process, one suitable comparator might be Unified Protocol (UP), a transdiagnostic treatment manual developed to target the emotional factors that tend to underlie and maintain symptoms across diagnoses (Ellard et al., 2010), and which is delivered in a similar fashion (e.g. homework assignments).

In contrast to most treatment manuals in CBT, UP is based on the idea of providing a single protocol to different psychiatric disorders given their shared characteristics, i.e. the tendency to experience increased emotional reactivity, the inclination to perceive these experiences as aversive and intolerable, and to attempt to avoid or escape from these experiences (Ellard et al., 2010). UP addresses these issues in treatment using interventions common to CBT, for instance, practicing cognitive restructuring, inhibiting emotional avoidance, and utilizing exposure. However, compared to CBT, UP puts greater emphasis on emotions, such as understanding their functional nature and altering the perception of and maladaptive responses to emotional stimuli (Barlow et al., 2010).

UP has mostly been applied to depression and anxiety disorders, and evaluated face-to-face, either individually or in groups (Cassillo-Robbins et al., 2020), although a few examples of providing treatment via the Internet (Wurm et al., 2017), and smartphones exist (Osma et al., 2022). A meta-analysis by Longley and Gleiser (2023) identified 21 studies, with UP demonstrating aggregated between-group effects compared to controls of g 1.22 for depression and 0.97 for anxiety. Qualitative studies also suggest that it is well-accepted, with interventions being considered meaningful and helpful in gaining insight and learning new strategies to deal with their emotions (Christensen et al., 2022). With regard to perfectionism, one example of providing UP exists (Mahmoodi et al., 2020). In this case, 75 participants recruited from different clinics in Tehran, Iran, were randomly assigned to face-to-face CBT, UP, or a wait-list, and followed for six months. Both CBT and UP demonstrated comparable effects on symptoms of psychiatric disorders and quality of life, but greater benefits were obtained on symptoms of perfectionism for CBT.

The current study

To date, CBT for perfectionism has been tested in at least 15 RCTs (Galloway et al., 2021). Several of these studies have also demonstrated the benefits of providing treatment via the Internet, which has the additional advantage of reaching those who do not have access to a therapist face-to-face (Andersson, Titov, et al., 2019). Yet, in order to move the field forward, additional studies are needed, especially comparing CBT against an active comparator (Seiferth et al., 2023). A few attempts have been made, such as by Shu et al. (2019), comparing unguided Internet-delivered CBT for perfectionism (iCBT-P) to nonspecific stress management and a wait-list. Here, 94 adolescent participants were randomized and followed for six months, indicating that iCBT-P produced better effects

on all outcomes. The study, however, suffered from high attrition rates and was aimed for a younger age group. Another case is by Mahmoodi et al. (2020), as referenced above, but this study was underpowered, did not employ an Intention-To-Treat (ITT) analysis, and did not assess adherence to treatment. The purpose of the current study is to advance the current understanding of CBT for perfectionism by addressing some of these limitations and target an adult age group. The aim is to test the effects of iCBT-P to an established treatment that is also transdiagnostic in nature, but does not specifically address perfectionism, Internet-delivered UP (iUP). In both cases, guidance on demand from a therapist will be provided, which has been shown to yield positive outcomes while requiring less assistance than regular guidance (Zetterberg et al., 2019). However, since the use of active comparators is uncommon, the current study is exploratory in nature and not designed to test superiority. The following research questions are addressed, in accordance with the study protocol (Buhrman et al., 2020): 1) what are the effects on self-rated perfectionism and psychiatric symptoms of an eight-week Internet-delivered treatment with guidance on demand (iCBT-P)? 2) what are the effects on the same outcomes for iUP? 3) to what extent has treatment affected other domains, such as relationships, as measured using subjective ratings?

Materials and methods

Participants

Participants were recruited using advertisements in social media (e.g. Facebook, Twitter, and LinkedIn), and the current study was also featured in two major Swedish newspapers. Although perfectionism was mentioned, the information focused on experiencing problems of high-standards, fear of failure, and self-criticism. Those interested in participating registered at a website and were directed to a secure online platform to complete a screening battery (Vlaescu et al., 2016). Login required an autogenerated identification code, e.g. 1234abcd, a strong personal password, and a six-letter code sent out via SMS. Inclusion criteria were: ≥ 18 years old, adequate reading and writing level in Swedish, having a computer, smartphone, or tablet with Internet access, and experiencing difficulties of perfectionism, i.e. >29 on the subscale Concern over Mistakes (CM) on the Frost Multidimensional Perfectionism Scale (FMPS; Frost et al., 1990). The cutoff >29 is based on a threshold derived from Suddarth and Slaney (2001), which has previously been used in studies of iCBT-P for perfectionism, e.g. Shafran et al. (2017). Psychiatric disorders were allowed as long as they did not warrant more immediate care, e.g. anorexia nervosa, as determined by the MINI-International Neuropsychiatric Interview (MINI; Sheehan et al., 1998). Participants with severe depression (>15) or exhibiting suicidal ideation (>2 on item nine) on the Patient Health Questionnaire – 9 Items (PHQ-9; Kroenke et al., 2001) were excluded and contacted for referral to a healthcare provider. An ongoing psychological treatment or change in psychopharmacological medication within the last three months were also reasons for exclusion, as were individuals not living in Sweden. For a flow chart of the participants in the current study, see Figure 1. Participants excluded after the MINI were all suffering from a condition that required specialized healthcare, e.g. bipolar disorder.

An overview of the demographics can be seen in Table 1. Overall, most of the participants were women (93.5%), in a relationship (78.3%), and in their thirties. Most of the

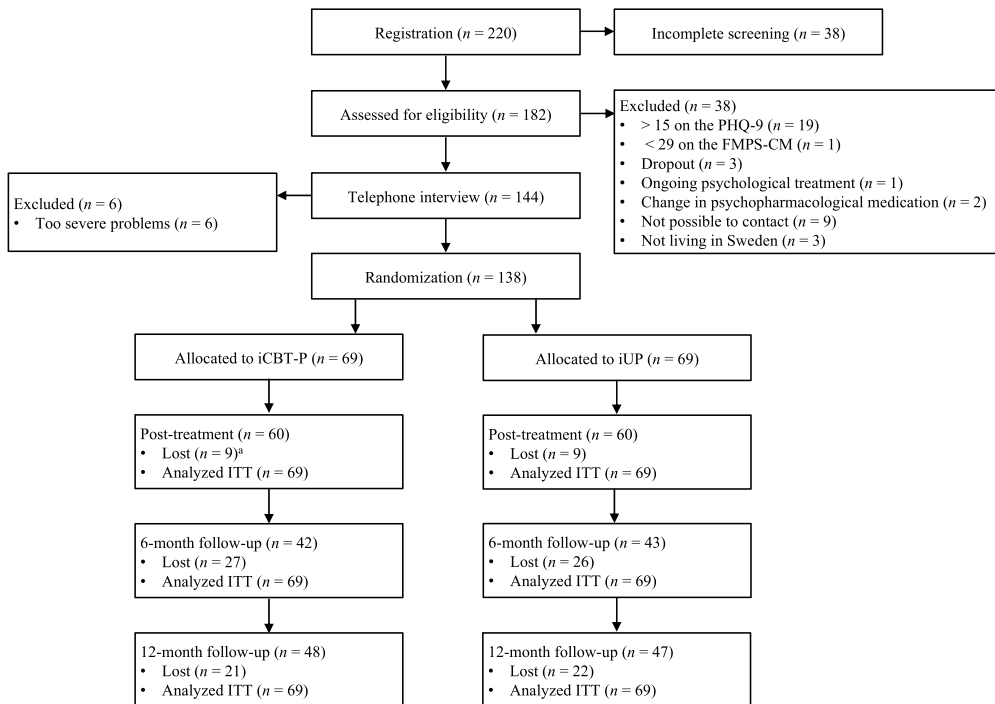


Figure 1. Flow chart of the participants.

participants were also highly educated (70.3% had a university degree) and were working (58.7%). Half of them fulfilled the criteria of ever having a depressive disorder, and considered themselves that perfectionism had become a problem from around age 16.

Procedure

Following completion of the screening battery, participants were assessed for eligibility and contacted via telephone for a structured clinical interview using the MINI. Ten random interviews were made in pairs to determine the inter-rater reliability, which achieved Cohen's κ of 0.9, i.e. excellent, diverging only on the occurrence of obsessive-compulsive disorder for one participant. In total, 138 participants were included and randomized to one of the two conditions according to a 1:1 ratio, and to one of the three therapists according to a 1:1:1 ratio. Randomization was performed by an independent person not part of the current study and using a random number generator (www.random.org). The two conditions did not differ at pre-treatment on any variable, $p > .05$, albeit with two exceptions; the average score for participants in iCBT-P was 1.46 lower than iUP on the Clinical Perfectionism Questionnaire (CPQ; Fairburn et al., 2003), $t(136) = -2.29$, $p = .02$, and the average score regarding the negative impact of perfectionism on the domain interests/hobbies/leisure was 1.22 higher for iUP than iCBT-P, $t(136) = -3.30$, $p < .01$.

Apart from accessing the content of the treatments, the secure online platform allowed safe communication with the therapists. Only notices to log on were sent out to the

Table 1. Demographic characteristics of the participants.

	iCBT-P (<i>n</i> = 69)	iUP (<i>n</i> = 69)	Total sample (<i>n</i> = 138)
Gender: <i>n</i> (%)			
Female	65 (94.2)	64 (92.8)	129 (93.5)
Male	3 (4.4)	5 (7.2)	8 (5.8)
Non-binary	1 (1.4)	0 (0.0)	1 (0.7)
Age (years): <i>M</i> (<i>SD</i>)	35.1 (8.0)	32.6 (9.3)	33.8 (8.7)
Relationship status: <i>n</i> (%)			
Single	16 (23.2)	12 (17.4)	28 (20.3)
Married/Partner	51 (73.9)	57 (82.6)	108 (78.3)
Divorced/Widowed	2 (2.9)	0 (0.0)	2 (1.4)
Children: <i>n</i> (%)			
Yes, at home	33 (47.8)	20 (29.0)	53 (38.4)
Yes, not at home	2 (2.9)	4 (5.8)	6 (4.3)
No	34 (49.3)	45 (65.2)	79 (57.2)
Highest education level: <i>n</i> (%)			
Elementary school	1 (1.4)	1 (1.4)	2 (1.4)
High school	7 (10.1)	7 (10.1)	14 (10.1)
Vocational school	0 (0.0)	3 (4.3)	3 (2.2)
University (individual courses)	8 (11.6)	11 (15.9)	19 (13.8)
University (degree, e.g. bachelor)	51 (73.9)	46 (66.7)	97 (70.3)
Graduate school	1 (1.4)	0 (0.0)	1 (0.7)
Other	1 (1.4)	1 (1.4)	2 (1.4)
Employment: <i>n</i> (%)			
Unemployed	1 (1.4)	3 (4.3)	4 (2.9)
Student	14 (20.3)	17 (24.6)	31 (22.5)
Employed	45 (65.2)	36 (52.2)	81 (58.7)
Self-employed	2 (2.9)	1 (1.4)	3 (2.2)
Parent leave	2 (2.9)	4 (5.8)	6 (4.3)
Sick leave (>3 months)	2 (2.9)	3 (4.3)	5 (3.6)
Vocational practice	1 (1.4)	0 (0.0)	1 (0.7)
Retired	0 (0.0)	1 (1.4)	1 (0.7)
Other	2 (2.9)	4 (5.8)	6 (4.3)
Psychiatric disorder according to MINI: <i>n</i> (% yes) ^b			
Major depressive disorder, current	4 (5.8)	4 (5.8)	8 (5.8)
Major depressive disorder, ever ^c	38 (55.1)	38 (55.1)	76 (55.1)
Hypomanic episode, ever	1 (1.5)	1 (1.5)	2 (1.4)
Manic/hypomanic episode, past	1 (1.5)	0 (0.0)	1 (0.7)
Panic disorder, current	4 (5.8)	1 (1.5)	5 (7.2)
Panic disorder, past	5 (7.2)	7 (10.1)	12 (8.7)
Agoraphobia	4 (5.8)	1 (1.5)	5 (3.7)
Social anxiety disorder	10 (14.5)	4 (5.8)	14 (10.1)
Obsessive-compulsive disorder	5 (7.2)	6 (8.7)	11 (8.0)
Posttraumatic stress disorder	1 (1.5)	1 (1.5)	2 (1.4)
Alcohol abuse/dependence	0 (0.0)	2 (2.9)	2 (1.4)
Substance abuse/dependence	2 (1.4)	0 (0.0)	2 (1.4)
Psychotic episode, past	0 (0.0)	1 (1.5)	1 (0.7)
Anorexia nervosa	0 (0.0)	0 (0.0)	0 (0.0)
Bulimia nervosa	0 (0.0)	2 (2.9)	2 (1.4)
Binge eating	0 (0.0)	0 (0.0)	0 (0.0)
Generalized anxiety disorder	11 (15.9)	4 (5.8)	15 (10.9)
Ongoing psychological treatment: <i>n</i> (% yes) ^a	3 (4.3)	1 (1.4)	4 (2.9)
Regularly taking psychotropic medication: <i>n</i> (% yes)	10 (14.5)	7 (10.1)	17 (12.3)
Age when perfectionism became a problem: <i>M</i> (<i>SD</i>)	15.5 (8.3)	16.4 (6.8)	16.0 (7.6)

iCBT-P = Internet-based cognitive behavior therapy for perfectionism; iUP = Internet-based Unified Protocol; MINI = The MINI International Neuropsychiatric Interview (7.0.0 Swedish Version).

^aIncluded only self-treatment, routine pharmacological follow-up, and psychiatric assessment.

^bParticipants could fulfill several psychiatric disorders and were therefore categorized as such.

^cIncluding current major depressive disorder.

participants and the therapists when a message had been received or an outcome measure had to be completed online. Weekly assessments were administered using the CPQ and the PHQ-9; if a participant experienced an increase in depressive symptoms or scored >2 on suicidality (item 9) on the PHQ-9, their therapist was notified to conduct a check-in.

Treatments and therapists

The current study compared two conditions; iCBT-P, based on a treatment manual by Egan et al. (2016) devoted specifically for problems of perfectionism, and iUP, a transdiagnostic treatment manual developed by Barlow et al. (2010) aimed at targeting underlying emotional factors maintaining many psychiatric disorders (see the introduction for a review). Both conditions spanned over eight weeks and were delivered as one module, or chapter, per week, which were automatically assigned on Mondays to all participants. The modules contained reading material, graphics, audio and video, and exercises. Participants logged on to the secure online platform to gain access to the content and implement new skills, e.g. planning and reporting the results from behavioral experiments, and were encouraged to

Table 2. Overview of treatment modules.

Week	iCBT-P	iUP
1	Understanding your perfectionism, e.g. what is unhelpful perfectionism, what are the pros and cons of perfectionism <i>Words: 3701</i>	Emotional symptoms, e.g. what are emotional symptoms, is this treatment for me, registering your experiences, finding your motivation, setting goals <i>Words: 6988</i>
2	Your own model, values, and motivation, e.g. creating an individual conceptualization on what maintains your perfectionism, cost-benefit analysis <i>Words: 2398</i>	Understanding your emotions, e.g. introduction to emotions, what is an emotion, monitor your emotions <i>Words: 6903</i>
3	Surveys and experiments, e.g. introduction to behavioral experiments, scheduling of pleasurable activities <i>Words: 3058</i>	Emotional awareness, e.g. introduction to emotional awareness, practicing non-judgmental mindfulness, anchoring <i>Words: 7620</i>
4	Dealing with perfectionistic behaviors, e.g. dealing with avoidance and safety behaviors, procrastination, and problem-solving <i>Words: 5822</i>	Thoughts, e.g. what are cognitive judgments, automatic judgments, identifying automatic judgments, thinking errors, cognitive restructuring <i>Words: 6615</i>
5	New ways of thinking, e.g. introduction to cognitive bias, dichotomous thinking, rigidity, focusing on negatives, disregarding positives <i>Words: 4209</i>	Behaviors, e.g. introduction to emotional avoidance, strategies for emotional avoidance, emotional behaviors, preventing avoidance and emotional responses <i>Words: 6093</i>
6	Self-criticism and self-compassion, e.g. introduction to self-compassion, becoming aware of self-critical thinking, practicing compassionate thinking <i>Words: 3006</i>	Emotional exposure, e.g. exposure to emotional situations and using imagery <i>Words: 4258</i>
7	Self-worth, e.g. introduction to self-worth, becoming less focused on performance, connecting self-worth to values <i>Words: 2604</i>	Continued emotional exposure <i>Words: 1427</i>
8	Maintain and continue positive change, e.g. maintaining progress, preventing and managing different setbacks, Q&A, your own plan forward <i>Words: 2625</i>	Planning ahead, e.g. repeating skills and dealing with emotions, determining your progress, becoming your own therapist, long-term goals, maintenance, managing setbacks <i>Words: 1809</i>
	<i>Total number of words: 27.423</i>	<i>Total number of words: 41.763</i>

iCBT-P = Internet-based cognitive behavior therapy for perfectionism; iUP = Internet-based Unified Protocol

complete homework assignments by the end of the week. In order to match the typical difficulties experienced in perfectionism, slight changes were made to the original treatment manual in iUP; 1) examples were adapted to be more perfectionism-relevant, 2) the module on interoceptive exposure to physical sensations was removed as it was deemed less relevant for the target population, and 3) a few paragraphs on intrusions and compulsions were also discarded. For an overview of the modules, see [Table 2](#).

Following randomization, all participants were allocated a therapist to contact when needed, i.e. guidance on demand. In other words, regular feedback was not provided, but participants were informed that they could send a message to their therapist whenever needed and that a response would follow within 24 hours. This could involve questions on content, support on how to conduct an exercise, or requesting feedback. The therapists consisted of two students attending the study program in psychology (Master's degree) and who had completed three semesters of clinical training in CBT, and one experienced clinical psychologist undergoing continued clinical training as part of the study program in psychotherapy. All therapists had received a basic introduction to iCBT-P and iUP from the principal investigators of the current study (AR and MB) and received weekly supervision during treatment.

Ethics and pre-registration

The current study received ethical approval by the Swedish Ethical Review Authority (Dnr: 2020-01868). It was pre-registered as a clinical trial at [ClinicalTrials.gov](https://clinicaltrials.gov) (NCT04459260), and a study protocol was published prior to recruitment (Buhrman et al., 2020). All participants provided informed consent upon registering their interest to participate.

Outcome measures

All outcome measures were completed by the participants at pre-treatment (PRE), post-treatment (POST), 6-month follow-up (FU6), and 12-month follow-up (FU12). The CPQ and PHQ-9 were also distributed weekly throughout the treatment phase (week 1–8). Meanwhile, the Credibility/Expectancy Questionnaire (CEQ; Borkovec & Nau, 1972) was only collected at week 2 to assess the participants' perception of the content in each condition, and the Negative Effects Questionnaire (NEQ; Rozental et al., 2016) was only administered at POST to probe for adverse and unwanted events experienced during the treatment phase.

[Table 3](#) provides an overview of all outcome measures and their psychometric properties. The CPQ and the FMPS were used as primary outcomes; both are frequently applied in research of perfectionism and cover its two higher-order dimensions, perfectionistic concerns, and perfectionistic strivings (Limburg et al., 2017), but with the key difference that the CPQ applies a time-frame (one month) in order to enhance clinical utility (Fairburn et al., 2003). The FMPS includes six subscales, of which CM and Personal Standards (PS) are typically used to assess change in treatment, and where Organisation is not included in the sum score (Egan et al., 2011). Moreover, both outcome measures have demonstrated good convergent and discriminant validity to other self-reports on perfectionism and psychiatric disorders, indicating that they seem to capture the

Table 3. Overview of outcome measures.

	Items	Scoring	Range	Psychometrics	Current study α
CPQ	12	1–4	12–48	$\alpha = .68$ (Parks et al., 2021)	.64
FMPS	35	1–5	29–145 ^a	$\alpha = .90$ (Frost et al., 1990)	.88
CM	9		9–45	$\alpha = .88$ (Frost et al., 1990)	.86
PS	7		7–35	$\alpha = .83$ (Frost et al., 1990)	.70
DA	4		4–20	$\alpha = .77$ (Frost et al., 1990)	.74
PE	5		5–25	$\alpha = .84$ (Frost et al., 1990)	.88
PC	4		4–20	$\alpha = .84$ (Frost et al., 1990)	.89
O	6		6–30	$\alpha = .93$ (Frost et al., 1990)	.79
PHQ-9	9	0–3	0–27	$\alpha = .89$ (Kroenke et al., 2001)	.82
GAD-7	7	0–3	0–21	$\alpha = .92$ (Spitzer et al., 2006)	.87
BBQ	12	1–4	0–96	$\alpha = .76$ (Lindner et al., 2016)	.75
SCS-SF	12	1–5	12–60	$\alpha = .86$ (Raes et al., 2011)	.83
PPS	12	1–5	12–60	$\alpha = .78$ (Rozenal et al., 2014)	.93
PSS-14	14	0–4	0–56	$\alpha = .84-.86$ (Cohen et al., 1983)	.84
CEQ	5	0–10	0–50	$\alpha = .86-.90$ (Devilley & Borkovec, 2000)	.82
NEQ	20	0–4	0–80	$\alpha = .95$ (Rozenal et al., 2016)	.76

CPQ = Clinical Perfectionism Questionnaire; FMPS = Frost Multidimensional Perfectionism Scale; CM = Concern over Mistakes; DA = Doubts about Action; PE = Parental Expectations; PC = Parental Criticism; PS = Personal Standards; O = Organisation; PHQ-9 = Patient Health Questionnaire – 9-Items; GAD-7 = Generalized Anxiety Disorder – 7-Items; BBQ = Brunnsvikien Brief Quality of Life Scale; SCS-SF = Self-Compassion Scale - Short Form; PPS = Pure Procrastination Scale; PSS = Perceived Stress Scale – 14 items; CEQ = Credibility/Expectancy Questionnaire; NEQ = Negative Effects Questionnaire.

^aExcluding the subscale Organisation.

construct of perfectionism well, and that higher scores on perfectionism are associated with higher scores on, for example, depression and anxiety (Limburg et al., 2017).

For secondary outcome measures, the PHQ-9 was administered to assess depression and the Generalized Anxiety Disorder – 7 Items (GAD-7; Spitzer et al., 2006) for worry and anxiety. Both are often used as screening tools and symptom monitoring, and correspond well with other self-report measures of psychiatric disorders (Kroenke et al., 2001; Spitzer et al., 2006). The Brunnsvikien Brief Quality of Life Scale was also included (BBQ; Lindner et al., 2016), which determines the quality of life in six different life domains (e.g. leisure), multiplied by each domain's self-rated level of importance (e.g. "my leisure time is important to me"). The BBQ has demonstrated good convergence, discriminant validity, and classification accuracy (Lindner et al., 2016). Furthermore, the Self-Compassion Scale—Short Form (SCS-SF; Raes et al., 2011) was used to evaluate participants' self-compassion. The SCS-SF has been shown to correlate with self-report measures of psychiatric disorders, in that lower self-compassion is linked to higher symptoms of, for example, depression and anxiety (Raes et al., 2011). In addition, the Pure Procrastination Scale was distributed to assess procrastination (PPS; Steel, 2010), and the Perceived Stress Scale – 14 Items (PSS; Cohen et al., 1983) for stress, both having demonstrated good convergent and discriminant validity (Lee, 2012; Rozenal et al., 2014). As for the CEQ, it has been shown to differentiate between treatments with regard to their credibility and expectancy of being helpful, and also being correlated with outcome measures (Devilley & Borkovec, 2000). Meanwhile, the NEQ has been used to assess the incidence and impact of negative effects during treatment, but has mainly been reported descriptively, while the association with other outcome measures is unclear (Rozenal et al., 2019). Only those negative effects that the participants attribute to treatment are reported.

Furthermore, at PRE and POST participants provided a score on a 10-point Likert-scale regarding how negatively they were affected by perfectionism in eight different life domains: interests/leisure, work/studies, friendships/social life, community engagement/spirituality, family life/parenting, rest/sleep, love/intimate relationships, and physical activity/diet. On these same occasions, participants were also able to define their goals for treatment and to what extent they believed to have achieved them, also scored on a 10-point Likert-scale. Similarly, eight items on the quality of the treatment were administered at POST (e.g. “Overall, how satisfied are you with the treatment you received?”), rated from 1 (“Bad”) to “4” (“Excellent”), and one item on the relevance of the treatment (“To what degree did you believe the content was relevant for your specific problems?”), with 0 corresponding to “Not at all” to 100 “Very well.” No specific measure of adherence was used, but a proxy for completion rate was determined by the number of modules that were opened by the participants, as logged by the secure online platform.

Statistical analysis

Following the principle of ITT, data from all randomized participants were used in the analyses of the primary and secondary outcomes. The CPQ was administered at PRE and POST as well as weekly during the treatment phase (week 1–8) and then analyzed using Linear Mixed effects Models (LMM’s). The models included subject-specific intercepts and slopes for time (random effects), fixed effects for treatment group and time (treated as a continuous variable), and an interaction term between time and treatment group. The time-variable was rescaled so that β ’s represented the symptom difference from PRE to POST. The between-group effect size (Cohen’s d) for the CPQ at the primary endpoint was calculated as $d = \frac{2(\beta/SE)}{\sqrt{df}}$ using the model estimates for the time*treatment group coefficient.

All other outcomes, including the CPQ during the follow-up phase, were analyzed using LMM’s with subject-specific random intercepts, fixed effects for treatment group and time (treated as a categorical variable: PRE, POST, FU6, FU12, using PRE as the reference level), and interaction terms between time and treatment group. The time*treatment group β ’s represents the between-group difference in symptom change from PRE to FU6 and FU12. Between-group effect sizes were calculated as Cohen’s d for the observed data (the difference in means divided by the pooled SD). Within-group effect sizes were calculated as the difference in means divided by the standard deviation at PRE, for each treatment group, respectively, and for all outcomes.

LMM’s provide unbiased estimates with missing data under the assumption that data is missing at random (MAR), conditional on covariates, and observed outcomes (Hedeker & Gibbons, 2006). To assess the sensitivity of the results to the MAR assumption, multiple imputation by chained equations was used to create 20 imputed datasets. Values for the CPQ were imputed for each treatment group separately, using predictive mean matching. The predictors included any of the following variables with a point-biserial correlation to missingness of ≥ 0.3 ; all of the outcomes (at all time-points), gender, prior medication, and ongoing treatment. Change on the CPQ during the treatment phase was analyzed as described above for all imputed datasets, and estimates were pooled using Rubin’s rule (Rubin, 1987).

Differences in means and frequencies for all other variables, e.g. age and improvement rates, were analyzed using two-sided *t*-tests and Pearson χ^2 . For the secondary outcome measure regarding how negatively participants were affected by perfectionism in eight different life domains, analyses were made using repeated measures ANOVAs for those cases where complete data were available. A *p*-value of .05 was employed to determine statistical significance.

All statistical analyses were performed in R version 4.2.2.

In order to determine the number of recovered, improved, non-responders, and deteriorated, dummy coded variables were created (1 = yes, 0 = no) on cases where complete data on the CPQ were available. For improvement, the clinically significant change criterion *a* was used (i.e. two SD from the mean of a dysfunctional population at pre-treatment and exceeding the Reliable Change Index; RCI) (Truax, 1992). A similar approach was applied for the FMPS-CM, but with a cutoff of <29 to determine clinically significant change (Suddarth & Slaney, 2001). Meanwhile, improvement was based on a positive change exceeding the RCI, non-response on any change within the limits of the RCI, and deterioration on a negative change exceeding the RCI.

Results

Dropouts, completion rate, and guidance on demand

In total, eleven participants actively chose to drop out during treatment, five for iCBT-P (7.2%) and six for iUP (8.7%), with no difference between the conditions, $\chi^2(1, n = 138) = .10, p = .75$.

For participants in iCBT-P, one started or changed the dosage of a psychotropic medication during the treatment phase (Sertraline, due to major depressive disorder caused by external circumstances), and four commenced another form of psychotherapy (two for unspecified issues, one due to stress at the workplace, and one for perfectionism). For participants in iUP, two commenced another form of psychotherapy (one for exhaustion disorder and one for health anxiety). There was no difference between the conditions regarding these changes, $\chi^2(1; n = 85) = 1.2, p = .27$, and $\chi^2(1; n = 85) = 0.42, p = .52$.

Furthermore, there was no difference between the conditions with regard to the number of opened modules during treatment (see Table 4), $t(136) = 1.14, p = .26$, nor

Table 4. Number of opened modules during treatment.

	iCBT-P (<i>n</i> = 69)	iUP (<i>n</i> = 69)	Total (<i>n</i> = 138)
One module	67 (97.1%)	68 (98.6%)	135 (97.8%)
Two modules	60 (87.0%)	60 (87.0%)	120 (87.0%)
Three modules	53 (76.8%)	52 (75.4%)	105 (76.1%)
Four modules	51 (73.9%)	46 (66.7%)	97 (70.1%)
Five modules	48 (69.6%)	40 (58.0%)	88 (63.8%)
Six modules	46 (66.7%)	38 (55.1%)	84 (60.9%)
Seven modules	43 (62.3%)	33 (47.8%)	76 (55.1%)
Eight modules	40 (58.0%)	33 (47.8%)	73 (52.9%)

iCBT-P = Internet-based cognitive behavior therapy for perfectionism; iUP = Internet-based Unified Protocol.

the number of messages sent to the therapist when requesting guidance on demand, $t(124) = -0.17, p = .87$, iCBT-P $M = 2.66$ ($SD = 2.19$) and iUP $M = 2.58$ ($SD = 2.88$).

Credibility, relevance, and quality ratings

There was no difference between the conditions concerning how credible the participants perceived their treatment to be, as assessed using the CEQ, $t(93) = -.27, p = .79$, with iCBT-P ($n = 47$) scoring 33.8 ($SD = 6.9$), and iUP ($n = 48$) scoring 34.2 ($SD = 6.0$).

Similarly, there was no difference between the conditions regarding how relevant the participants believed the treatment modules to be for their problems, $t(117) = .90, p = .37$, with iCBT-P ($n = 59$) scoring 73.6 ($SD = 23.5$) and iUP ($n = 60$) scoring 70.0 ($SD = 19.6$).

Moreover, there was no difference between the conditions in terms of how the participants rated the quality of the treatments, $ts(112) = -1.32$ to $.78, p = .19-.99$.

Primary outcomes

The model for the CPQ during the treatment phase showed reduced symptoms over time with large within-group effect sizes for both iCBT-P ($d = 2.03$) and iUP ($d = 2.51$). There was no significant time*treatment group interaction ($\beta = 0.02, SE = 1.04, p = .98$), and a near null model-derived between-group effect size ($d = -0.00$ [95% CI: $-0.37; 0.36$]) during the treatment phase. See Table 5 and Figure 2.

The model for CPQ during the follow-up phase demonstrated no significant interaction between time and treatment group at FU6 ($\beta = 0.76, SE = 1.11, p = .49$) or FU12 ($\beta = -0.57, SE = 1.06, p = .59$). Between-group effect sizes from the observed data were $d = 0.12$ [95% CI: $-0.31; 0.56$] at FU6, and $d = 0.12$ [95% CI: $-0.28; 0.53$] at FU12. See Table 5 and Figure 2.

In the sensitivity analysis, using multiple imputation, no significant time*treatment group interaction was found ($\beta = -0.92, SE = 1.00, p = .36$).

Given that the CPQ consists of items that are related to both perfectionistic concerns and strivings, a post-hoc analysis separating these dimensions was made. The within-group effect sizes ranged between 2.29–2.79 for iCBT-P and 2.23–2.47 for iUP on perfectionistic concerns, and 1.49–1.77 for iCBT-P and 1.71–2.14 for iUP on perfectionistic strivings. There was no significant time*treatment group interaction at POST for either perfectionistic concerns ($\beta = 0.36, SE = 0.54, p = .51$) or perfectionistic strivings ($\beta = 0.45, SE = 0.49, p = .36$). See Table 7 in the Supplementary material for additional information.

As for the FMPS-CM, the model demonstrated reduced symptoms from PRE to POST, with moderate within-group effect sizes of $d = 0.73$ (iCBT-P), and $d = 0.71$ (iUP). There was no significant time*treatment group interaction at POST ($\beta = 0.69, SE = 1.29, p = .60$), and a between-group effect size of $d = -0.05$ [95% CI: $-0.42; 0.31$]. See Table 5.

The model for the FMPS-PS exhibited reduced symptoms from PRE to POST, with within-group effect sizes of $d = 0.31$ (iCBT-P), and $d = 0.79$ (iUP). There was a significant time*treatment group interaction at POST ($\beta = 2.03, SE = 0.81, p = .01$) in favor of iUP. However, since the between-group effect size is derived from the observed values, the

Table 5. Primary and secondary outcomes for both conditions.

Outcome	iCBT-P			iUP			LMM estimate ^a		Between-group effect size ^b
	<i>n</i>	Mean (<i>SD</i>)	Within- group effect size ^c	<i>n</i>	Mean (<i>SD</i>)	Within- group effect size ^c	β (<i>SE</i>)	<i>p</i>	<i>d</i> (95% <i>CI</i>)
Clinical Perfectionism Questionnaire									
Pre	69	38.21 (3.90)	NA	69	39.68 (3.61)	NA	NA	NA	NA
Post	60	30.28 (5.51)	2.03	60	30.60 (5.27)	2.51	0.02 (1.04) ^d	.98	-0.00 (-0.37; 0.36) ^e
FU6	42	28.57 (6.84)	2.47	43	29.35 (5.61)	2.86	0.76 (1.11)	.49	0.12 (-0.31; 0.56)
FU12	48	29.40 (6.99)	2.26	47	30.19 (5.81)	2.63	0.58 (1.06)	.59	0.12 (-0.28; 0.53)
Frost Multidimensional Perfectionism Scale (Concern over Mistakes)									
Pre	69	34.22 (6.75)	NA	69	34.07 (7.22)	NA	NA	NA	NA
Post	59	29.27 (7.29)	0.73	59	28.88 (8.08)	0.71	0.69 (1.29)	.60	-0.05 (-0.42; 0.31)
FU6	39	25.23 (8.12)	1.33	42	27.19 (8.69)	0.95	-2.02 (1.48)	.17	0.23 (-0.21; 0.68)
FU12	45	26.00 (9.22)	1.22	45	26.20 (9.01)	1.09	-0.46 (1.42)	.75	0.02 (-0.40; 0.44)
Frost Multidimensional Perfectionism Scale (Personal Standards)									
Pre	69	26.80 (4.47)	NA	69	28.01 (4.05)	NA	NA	NA	NA
Post	59	25.41 (4.54)	0.31	59	24.83 (5.11)	0.79	2.03 (0.81)	.01	-0.11 (-0.48; 0.25)
FU6	39	24.26 (4.68)	0.57	42	24.26 (6.29)	0.93	1.14 (0.93)	.22	0.00 (-0.44; 0.44)
FU12	45	23.58 (5.41)	0.72	45	24.33 (5.79)	0.91	0.56 (0.90)	.53	0.13 (-0.28; 0.55)
Frost Multidimensional Perfectionism Scale (Doubts about Action)									
Pre	69	13.57 (4.09)	NA	69	13.12 (3.41)	NA	NA	NA	NA
Post	59	11.42 (3.70)	0.52	59	11.49 (3.30)	0.48	-0.21 (0.56)	.72	0.02 (-0.35; 0.38)
FU6	39	10.03 (3.75)	0.86	42	10.02 (3.26)	0.91	-0.09 (0.65)	.89	0.00 (-0.44; 0.44)
FU12	45	10.33 (4.22)	0.79	45	9.96 (3.45)	0.93	-0.30 (0.62)	.63	-0.10 (-0.52; 0.32)
Frost Multidimensional Perfectionism Scale (Parental Expectations)									
Pre	69	12.62 (5.46)	NA	69	11.46 (4.91)	NA	NA	NA	NA
Post	59	11.66 (5.24)	0.18	59	10.66 (4.26)	0.16	0.57 (0.54)	.29	-0.21 (-0.57; 0.16)
FU6	39	11.10 (5.81)	0.28	42	10.50 (4.64)	0.20	0.21 (0.62)	.73	-0.12 (-0.56; 0.33)
FU12	45	11.84 (4.73)	0.33	45	10.91 (4.31)	0.11	-0.38 (0.60)	.52	0.02 (-0.40; 0.43)
Frost Multidimensional Perfectionism Scale (Parental Criticism)									
Pre	69	9.32 (4.86)	NA	69	8.39 (4.18)	NA	NA	NA	NA
Post	59	8.69 (4.55)	0.13	59	8.31 (4.10)	0.02	0.02 (0.48)	.96	-0.09 (-0.45; 0.27)
FU6	39	7.74 (3.83)	0.32	42	7.55 (4.94)	0.20	0.02 (0.55)	.98	-0.05 (-0.49; 0.40)
FU12	45	8.51 (4.29)	0.17	45	7.96 (4.03)	0.10	0.32 (0.53)	.54	-0.13 (-0.55; 0.29)
Frost Multidimensional Perfectionism Scale (Organization)									
Pre	69	24.86 (3.73)	NA	69	25.54 (3.78)	NA	NA	NA	NA
Post	59	23.98 (3.90)	0.23	59	23.25 (4.50)	0.60	1.10 (0.58)	.06	-0.17 (-0.54; 0.19)
FU6	39	24.69 (3.85)	0.04	42	23.81 (4.60)	0.46	1.08 (0.67)	.11	-0.21 (-0.65; 0.24)
FU12	45	23.87 (4.44)	0.26	45	23.78 (4.44)	0.47	0.62 (0.64)	.33	-0.02 (-0.44; 0.40)
Patient Health Questionnaire – 9 Items									
Pre	69	7.36 (4.05)	NA	69	7.15 (3.85)	NA	NA	NA	NA

(Continued)

Table 5. (Continued).

Outcome	iCBT-P			iUP			LMM estimate ^a		Between-group effect size ^b
	<i>n</i>	Mean (<i>SD</i>)	Within- group effect size ^c	<i>n</i>	Mean (<i>SD</i>)	Within- group effect size ^c	β (<i>SE</i>)	<i>p</i>	<i>d</i> (95% <i>CI</i>)
Post	59	4.73 (4.78)	0.65	59	5.58 (3.66)	0.41	-0.97 (0.83)	.24	0.19 (-0.17; 0.56)
FU6	39	4.31 (4.44)	0.75	43	4.84 (4.07)	0.60	-0.49 (0.94)	.60	0.12 (-0.32; 0.56)
FU12	48	5.35 (4.28)	0.49	46	5.89 (5.21)	0.33	-0.86 (0.89)	.34	0.11 (-0.30; 0.52)
Generalized Anxiety Disorder – 7 Items									
Pre	69	6.84 (3.68)	NA	69	7.41 (4.37)	NA	NA	NA	NA
Post	59	4.63 (3.93)	0.60	58	5.93 (3.39)	0.34	-0.72 (0.78)	.36	0.35 (-0.01; 0.72)
FU6	39	4.67 (3.92)	0.59	43	4.53 (3.53)	0.66	0.93 (0.88)	.29	-0.04 (-0.48; -0.41)
FU12	48	4.94 (3.92)	0.52	46	5.23 (3.95)	0.50	0.21 (0.84)	.81	0.08 (-0.33; 0.49)
Brunnsviken Brief Quality of Life Scale^f									
Pre	69	47.80 (18.16)	NA	69	49.77 (16.68)	NA	NA	NA	NA
Post	58	53.93 (19.47)	-0.34	57	52.61 (17.80)	-0.17	3.50 (3.06)	.25	-0.07 (-0.44; 0.30)
FU6	39	59.08 (16.23)	-0.62	43	54.81 (22.63)	-0.30	4.67 (3.46)	.18	-0.21 (-0.66; 0.23)
FU12	48	57.27 (19.20)	-0.52	46	56.24 (18.46)	-0.39	3.55 (3.39)	.28	-0.05 (-0.46; 0.36)
Self-Compassion Scale – Short Form^f									
Pre	69	27.96 (7.14)	NA	69	29.22 (7.88)	NA	NA	NA	NA
Post	58	33.91 (8.27)	-0.83	57	34.35 (8.63)	-0.65	0.53 (1.29)	.68	0.05 (-0.32; 0.42)
FU6	39	37.54 (7.83)	-1.34	42	37.36 (9.07)	-1.03	0.63 (1.46)	.67	-0.02 (-0.46; 0.42)
FU12	47	36.66 (10.05)	-1.22	45	37.29 (8.87)	-1.02	0.90 (1.40)	.52	0.06 (-0.35; 0.48)
Pure Procrastination Scale									
Pre	69	35.45 (11.98)	NA	69	33.30 (9.94)	NA	NA	NA	NA
Post	58	31.40 (11.55)	0.79	56	30.75 (9.17)	0.26	-0.72 (1.28)	.57	-0.06 (-0.43; .031)
FU6	39	27.41 (9.83)	0.87	42	28.26 (9.83)	0.51	-1.15 (1.46)	.43	0.08 (-0.36; 0.53)
FU12	46	30.48 (11.29)	0.97	45	28.62 (8.21)	0.47	-0.52 (1.39)	.71	-0.19 (-0.61; 0.23)
Perceived Stress Scale – 14 Items									
Pre	69	30.75 (7.09)	NA	69	32.20 (6.37)	NA	NA	NA	NA
Post	58	25.17 (8.49)	0.79	56	26.64 (6.93)	0.87	-0.18 (1.39)	.89	0.19 (-0.18; 0.56)
FU6	39	24.56 (6.88)	0.87	42	22.55 (8.03)	1.52	3.55 (1.57)	.02	-0.27 (-0.71; 0.18)
FU12	46	23.85 (8.42)	0.97	45	24.8 (8.67)	1.16	0.17 (1.50)	.91	0.11 (-0.31; 0.53)

^a β refers to the time*treatment group interaction.

^bCalculated as the difference of the means between iCBT and iUP divided by the pooled standard deviation, using only the observed data. The sign has been reversed so that positive values indicate lower symptoms in the iCBT-P group.

^cEffect size at follow-ups as compared to the pre-treatment, calculated as the difference of the means divided by the standard deviation pre-treatment for each treatment group, respectively.

^dThis estimate is from the model for the primary outcome, see Statistical analysis section for model specification.

^eModel derived effect size calculated as $d = \frac{2(\beta/SE)}{\sqrt{df}}$ for the time*treatment group interaction.

^fOutcome scored in reverse, with higher scores indicating a positive result, e.g. higher quality of life. For the between-group effect sizes this means that a negative value indicates lower symptoms for iCBT-P group.

iCBT-P = Internet-based cognitive behavior therapy for perfectionism; iUP = Internet-based Unified Protocol.

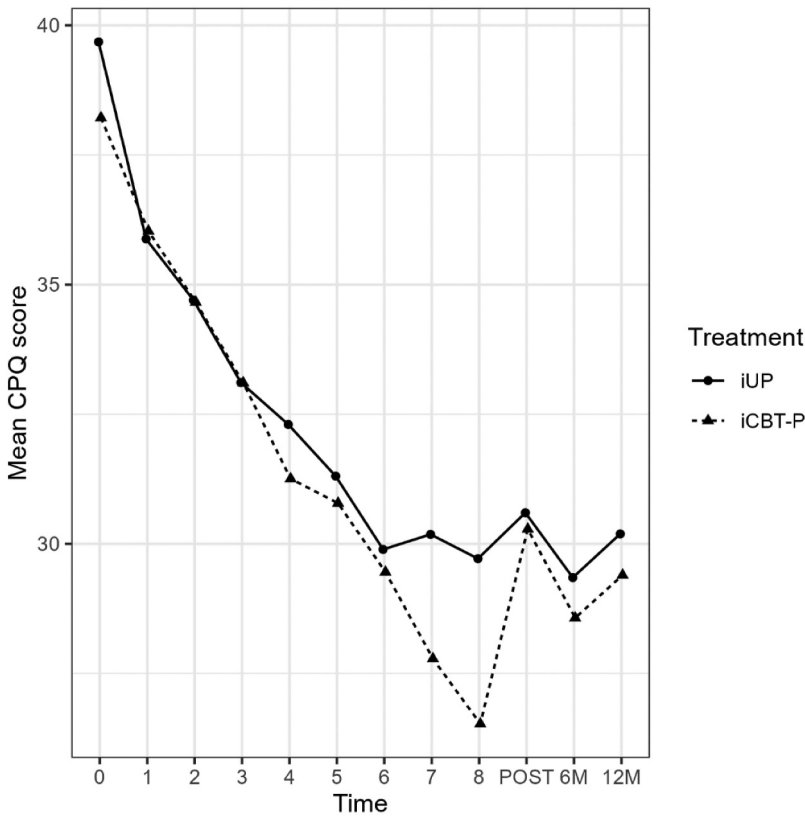


Figure 2. Observed mean values on the CPQ during the treatment phase and follow-up. iCBT-P = Internet-based cognitive behavior therapy for perfectionism; iUP = Internet-based Unified Protocol.

95% CI for the effect size included a zero effect ($d = -0.11$ [95% CI: -0.48 ; 0.25]). See Table 5.

Secondary outcomes

The results for the secondary outcomes can be found in Table 5. Within-group effect sizes ranged from small (FMPS Parental Expectations and Parental Criticism) to large (SCS-SF and PSS). There was only a significant time*treatment group interaction at POST ($\beta = 3.55$, $SE = 1.57$, $p = .02$) in favor of iUP on the PSS-14. However, since the between-group effect size is derived from the observed values, this difference was not significant ($d = -0.27$ [95% CI: -0.71 ; 0.18]).

Both conditions demonstrated an improvement over time in terms of how negatively the participants were affected by perfectionism in all eight life domains, but there were no significant time*treatment group interactions, $F_s(1, 117) = 0.02-0.99$, $p_s .32-.90$. See Table 8 in the Supplementary material for an overview. In terms of goal achievement, participants in iCBT-P scored on average 6.03 ($SD = 1.81$), and 5.50 ($SD = 2.31$) in iUP, with no significant difference between the conditions, $t(48) = 1$, $p = .32$.

Table 6. Rates of recovery, improvement, non-response, and deterioration on the CPQ, n (%), based on complete cases.^a

	iCBT-P (n = 69)			iUP (n = 69)			Total (n = 138)		
	Post	6 months	12 months	Post	6 months	12 months	Post	6 months	12 months
Recovery ^b	22 (31.9%)	23 (33.3%)	25 (36.2%)	27 (40.6%)	24 (34.8%)	25 (36.2%)	47 (39.9%)	46 (33.3%)	50 (36.2%)
Improvement ^c	29 (42.0%)	32 (46.4%)	28 (40.6%)	39 (58.0%)	32 (46.4%)	31 (44.9%)	63 (52.9%)	60 (43.5%)	58 (42.0%)
Non-response ^d	16 (23.2%)	11 (15.9%)	20 (29.0%)	13 (29.0%)	11 (15.9%)	16 (23.2%)	34 (34.1%)	26 (18.8%)	37 (26.8%)
Deterioration ^e	2 (2.9%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (1.4%)	0 (0.0%)	0 (0.0%)

iCBT-P = Internet-based cognitive behavior therapy for perfectionism; iUP = Internet-based Unified Protocol; CPQ = Clinical Perfectionism Questionnaire.

^aA participant that is classified as recovered can also be classified as improved, hence, the total number can exceed the number of participants in each condition.

^bClinically significant change; criterion a, i.e. two standard deviations from the mean of a dysfunctional population at pre-treatment and exceeding the Reliable Change Index.

^cExceeding the Reliable Change Index in a positive direction.

^dWithin the limits of the Reliable Change Index.

^eExceeding the Reliable Change Index in a negative direction.

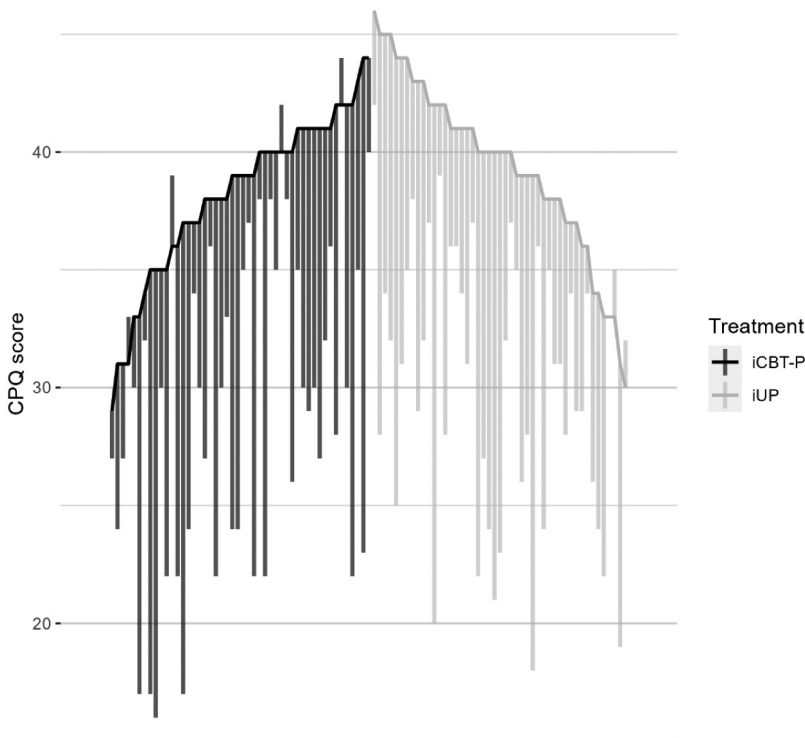


Figure 3. Individual change on the CPQ from pre- to post-treatment. The bold lines represent values at pre-treatment. iCBT-P = Internet-based cognitive behavior therapy for perfectionism; iUP = Internet-based Unified Protocol.

Recovery, improvement, non-response, and deterioration

There were no differences between the conditions in terms of recovery rates at POST, FU6, or FU12 for the CPQ, $\chi^2(1, n = 80-92) = 0.04-0.21, p = .65-.84$. See Table 6 for an overview, and Figure 3 for individual changes. Similarly, no differences were detected for improvement rates, $\chi^2(1, n = 86-99) = 0.15-0.94, p = .33-.70$, or non-response rates, $\chi^2(1, n = 86-99) = 0.00-0.88, p = .35-.95$. Only two participants (2.9%) deteriorated on the CPQ, both being in iCBT-P, but with no difference between the conditions $\chi^2(1, n = 99) = 2.26, p = .13$.

For a comparable calculation using the FMPS-CM, see Table 9 in the Supplementary material.

Negative effects

On average, the participants reported 1.5 negative effects ($SD = 2.1$) attributed to treatment, with 1.1 ($SD = 1.8$; sum = 79) in iCBT, and 1.9 ($SD = 2.3$; sum = 130) in iUP. There was a significant difference between the conditions, with more negative effects being reported in iUP, $t(136) = 2.28, p = .02$. The most frequently reported adverse and unwanted events overall were “Unpleasant memories resurfaced” ($n = 31$), “I felt like I was under more stress” ($n = 30$), “I experienced more unpleasant feelings” ($n = 19$), “I did not always understand my treatment” ($n = 18$), and “I experienced more anxiety” ($n = 16$). See Table 10 in the Supplementary material for a complete overview for each condition.

The covid-19 pandemic

Because of the COVID-19 pandemic, a question about its potential impact was included at FU12. In total, 47 out of the 90 (52.2%) responding participants reported that they had been affected, with no difference between the conditions, $\chi^2(1; n = 90) = 0.4, p = .53$. Of these, 42 (46.7%) were identified as negative experiences, and five (5.5%) as positive. A classification of the open-ended question that followed indicated that the most common negative themes were related to feelings of loneliness, being less active, or becoming depressed (20/42, 47.6%), and having worries about health (11/42, 26.2%), while the only positive theme involved having more time and being less stressed out (5/5, 100%).

Discussion

The current study demonstrated that iCBT-P was deemed credible, relevant, and of high quality by the participants, while being associated with few risks. It exhibited large within-group effects to POST ($d = 2.03$) on the CPQ, which is even greater than previous studies, such as 1.44 (ITT) in Rozental et al. (2017), 0.92 (ITT) in Shafran et al. (2017), and 1.19–1.41 (larger estimate when providing guidance) in Zetterberg et al. (2019). Furthermore, the fact that the results from the current study were slightly improved and maintained at FU6 ($d = 2.47$) and FU12 ($d = 2.26$) is also encouraging, adding estimates to the growing evidence on the long-term benefits of CBT for perfectionism, e.g. 1.32–1.49 (ITT), at six- and

12-month follow-up (Rozental et al., 2018). Similarly, medium to large within-group effects were obtained for the FMPS-CM ($d = 0.73\text{--}1.22$), in line with previous research, while the FMPS-PS demonstrated small to moderate effects ($d = 0.31\text{--}0.72$), thus being lower than prior findings (Wade et al., 2020). The poorer results for the FMPS-PS warrants some caution and should be explored in additional studies. Meanwhile, the difference in efficacy between FMPS-CM and FMPS-PS, i.e. perfectionistic concerns and standards, has been demonstrated in meta-analytic findings of CBT for perfectionism (Galloway et al., 2021), and might be due to a greater emphasis on targeting predictions and cognitive biases, while focusing less on addressing issues of self-evaluation.

In terms of binary outcomes, approximately one-third of the participants in iCBT-P were classified as recovered and about 40% as improved, which is slightly higher than for iCBT overall (35.0%; Andersson, Carlbring, et al., 2019). This is somewhat lower than previous studies that included regular guidance (Rozental et al., 2017; Shafran et al., 2017), but in line with the condition receiving guidance on demand in Zetterberg et al. (2019). Providing guidance in Internet-delivered treatments has been shown to improve outcomes (Andersson, Titov, et al., 2019), and qualitative studies indicate that participants perceive feedback from their therapist as important (Egan et al., 2022), suggesting that this type of support should perhaps be considered if implementing iCBT-P in regular care. However, both guidance on demand and a strictly unguided treatment may still be a useful option for some when no other alternative is available. Future research should explore what dosage in guidance is most beneficial, similar to a study on treatment length by Wade et al. (2020).

As for the secondary outcomes, the results were in the expected directions and magnitudes as previous research (Galloway et al., 2021), having greatest effects on self-compassion, procrastination, and stress. This is expected given that iCBT-P includes specific interventions for dealing with these issues, like module 6 which is completely devoted to self-compassion and managing self-criticism. As for depression and anxiety, the impact was less prominent, although it should be noted that symptom levels were subclinical to being with and that the effects are still in line with other studies (Shafran et al., 2017). Interestingly, the change in quality of life was somewhat lower than prior research (Rozental et al., 2017), but this could perhaps be attributed to the COVID-19 pandemic, which, because of enforced societal constraints, may have affected the participants' overall wellbeing. Participants also rated how negatively affected they experienced themselves to be by their perfectionism at PRE and POST (0–10), which displayed a significant reduction over time and across life domains (see Table 7 in the Supplementary material for an overview), while goal attainment was in the moderate level following treatment. These outcomes have not been used previously in other studies, but provide additional information on the benefits of iCBT-P.

Meanwhile, iUP fared well as a treatment for perfectionism, with none of the outcomes demonstrating a significant difference between the conditions. However, the noticeable jump in scores between week 8 and POST for iCBT-P should be noted, as seen in Figure 2. It seems as if iCBT-P did outperform iUP during the last two weeks of treatment, but that this difference disappeared upon completion. It is unclear what factors are responsible for this change, but it could be that efforts to collect post-treatment data (i.e. email reminders and telephone calls) affected the ITT analysis by getting scores on the CPQ from those participants who either had dropped out or were

less engaged in treatment. Meanwhile, rates of recovery, improvement, non-response, and deterioration were the same, and there were no differences in terms of credibility, relevance, quality, and completion rates. This transdiagnostic treatment could therefore be a viable option for individuals struggling with perfectionism, which is not unexpected given its proven efficacy for many psychiatric disorders, such as depression (Longley & Gleiser, 2023). Given its many shared interventions with CBT for perfectionism, e.g. cognitive restructuring, and its strong focus on understanding, identifying, and dealing with emotions, UP is likely to benefit many people with elevated perfectionism. Because of the positive impact on secondary outcomes for both conditions in the current study, it can also be speculated whether CBT and UP may be used interchangeably. This could indicate a lack of specificity, suggesting there is no need to differentiate between different treatments that are transdiagnostic in nature. Still, more research is needed as this is, to the knowledge of the authors, one of only two studies of UP for perfectionism. Mahmoodi et al. (2020) did obtain a difference, where CBT demonstrated better outcomes on perfectionism, while UP achieved better outcomes on anxiety sensitivity and emotion regulation, although there were no differences on symptoms of depression and anxiety. The current study was however delivered via the Internet compared to groups, and recruited a sample with much higher levels of perfectionism, which makes direct comparisons difficult. In addition, there was a significant difference between conditions at pre-treatment on the CPQ despite randomization, with participants in iCBT-P scoring on average 1.46 lower than iUP. To what extent this might have affected the results is not clear, but it does increase the latitude for change in iUP, which in turn could influence the within- and between-group effect sizes.

Dropout was low in both conditions in the current study (less than 10% actively chose to drop out), although the response rate to the CPQ demonstrates that many participants did not complete the primary outcome measures or were impossible to reach at follow-up (60.1–62.3% at six months and 68.1–69.6% at 12 months). This may be related to procedural issues surrounding the study or circumstances due to the COVID-19 pandemic, yet still comparable to previous research, e.g. 62.8% at 12 months in Rozental et al. (2018). However, these rates should not be confused with treatment tolerance, as pointed out by Egan et al. (2023). In comparison, three out of four participants completed half of the treatment in iCBT-P, and two-thirds of the participants in iUP. For iCBT-P, this is lower than the 93.2% completing half of the treatment in Rozental et al. (2017), but similar to Zetterberg et al. (2019) with 70.3% for guidance on demand and 75.8% for regular guidance. This difference between the studies is unclear but might be due to different samples, with participants in the current study having greater psychiatric comorbidity and levels of medication than previous research. A recent study by Grieve et al. (2022) demonstrated large benefits even after a few modules of iCBT-P, but future research should try to establish what dosage of CBT is needed to produce the greatest change in symptoms. Meanwhile, the difference in module completion between the conditions could be related to the number of words. iUP was almost 50% longer than iCBT-P, possibly affecting how participants engaged with texts and exercises. Moving forward, adjustments to the material of iUP may be needed to decrease treatment burden.

The current study was designed to be more explorative in nature, hence it is not possible to conclude that the two conditions are equivalent. Future research should instead design a study that investigates non-inferiority, although this would require

a much larger sample size. Moreover, iUP in the current study was adapted to seem more relevant for the participants, potentially blurring the lines between the two treatments and perhaps making it less comparable to UP in general. However, this mainly concerned the examples provided, which was made perfectionism-relevant instead of focusing on a particular psychiatric disorder. In addition, removing the module on interoceptive exposure to physical sensations seems reasonable as this primarily relates to the type of internal stimuli inherent in panic disorder, e.g. practicing hyperventilation or inducing dizziness. Although, many individuals with elevated levels of perfectionism may have difficulties identifying emotions (e.g. Pink et al., 2021), this is not the same issue as covered by this module. Whether or not these adaptations did make a difference in terms of how iUP was perceived is unclear but should be explored by qualitative means. This might also be helpful in understanding possible similarities and differences between iCBT-P and iUP, such as whether they are suitable for different individuals and if they achieve comparable outcomes but via different mechanisms. Future research could also investigate the integration of AI-enhanced guidance in iCBT-P, given its potential to improve treatment outcomes for perfectionism, as evidenced by promising results in a recent pilot study (Egan et al., 2024).

Limitations

The current study has many strengths, particularly the use of an active comparator, multiple outcome measures, and two follow-up assessments at six and 12 months. However, there are a number of limitations that need to be addressed when interpreting the results. First, classifying participants as recovered using criterion a by Truax (1992) is customary in the absence of an established cutoff. However, it is unclear whether this actually corresponds to being recovered, i.e. that perfectionism is no longer perceived as a problem in everyday life. In addition, because there are no diagnostic criteria for perfectionism, identifying participants eligible for inclusion is solely based on a cutoff, which may not represent clinical levels. Further research on this topic should be performed, perhaps inspired by a comparable study differentiating severe and less severe procrastination (Rozental et al., 2022). A similar limitation can be raised with regard to the cutoff of inclusion (>29), which is based on a threshold by Suddarth and Slaney (2001). Whether this is a cutoff that actually corresponds to having clinical issues with perfectionism needs to be explored and warrants some caution. Second, similar to prior research on CBT for perfectionism, the absolute majority of the participants were female, married or living with a partner, and being highly educated, which may not be representative of all individuals who have high levels of perfectionism. The recruitment strategy, which consisted of advertisements in social media and reports in newspapers, may also create selection bias. Future studies should be more mindful of this fact and use different recruitment strategies in order to reach other populations. Third, iCBT-P was compared to iUP in what is one of few studies on perfectionism utilizing an active comparator. However, it was not designed to test superiority, which would have required a predefined limit, i.e. margin of clinical significance. The current study was also not adequately powered to detect small between-group differences. This should be regarded as a limitation, but the estimates from the current study will nevertheless be informative in future research on what effects to expect from an active comparator. Fourth, the

internal consistency of the CPQ was low ($\alpha = .64$), which is a major limitation given its role as a primary outcome and use in the weekly assessments. This is somewhat lower than the previous research ($\alpha = .71\text{--}82$), but close to the validation of the Swedish translation of $\alpha = .68$ (Parks et al., 2021). Psychometric evaluations of the CPQ do suggest that some items may be problematic (e.g. items 2 and 8 that are reversely scored), and future research might therefore have to revise parts of the self-report measure in order for it to better capture the underlying construct of perfectionism, such as a ten-item version (Prior et al., 2018). As a consequence, the results on the CPQ in the current study warrant some caution and should be compared to the obtained outcomes on the FMPS. Fifth, there were no outcome measures of the interpersonal facets of perfectionism included. Thus, it was not possible to investigate whether iCBT-P or iUP had an effect on self-oriented perfectionism, socially prescribed perfectionism, and other-oriented perfectionism. Smith et al. (2023) suggest that the benefits of CBT for perfectionism may be less promising than interpersonal and psychodynamically oriented psychotherapies when it comes to these more trait-like features, but more research is warranted, for instance by including the Multidimensional Perfectionism Scale by Hewitt and Flett (1991). Lastly, a number of individuals were excluded due to having a psychiatric disorder that warranted more specialized healthcare. On the one hand, this might have affected the external validity of the results. Perfectionism is considered to be a transdiagnostic process that can lead to or exacerbate depressive symptoms and suicidal ideation and should therefore be important to target among people with severe conditions. On the other hand, patients who are severely depressed patients or suffering from bipolar disorder would receive the first-line treatment recommended for these psychiatric disorders prior to interventions for their perfectionism. Hence, the exclusion of certain individuals in the current study should resemble the decisions made by clinicians. However, administering CBT for perfectionism in specialized healthcare should be explored in future research.

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Data availability statement

Data can be shared upon request to the corresponding author.

Data deposition

Data has not been deposited.

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