Internet Interventions 2 (2015) 243–247

Contents lists available at ScienceDirect

Internet Interventions

journal homepage: www.invent-journal.com/

Self-guided internet-delivered cognitive behavior therapy (iCBT) for obsessive–compulsive disorder: 12 month follow-up

Bethany M. Wootton [a,b,*], Blake F. Dear [b], Luke Johnston [b], Matthew D. Terides [b], Nickolai Titov [b]

[a] School of Medicine (Psychology), University of Tasmania, P.O. Box 30, Hobart, TAS 7001, Australia
[b] eCentreClinic, Department of Psychology, Macquarie University, NSW, 2109, Australia

ARTICLE INFO

Article history:
Received 26 January 2015
Received in revised form 25 May 2015
Accepted 25 May 2015
Available online 12 June 2015

Keywords:
OCD
Anxiety
Obsessive
Internet
iCBT

ABSTRACT

Internet-delivered cognitive behavior therapy (iCBT) may reduce barriers to treatment faced by people with obsessive–compulsive disorder (OCD). To date, most research on iCBT for OCD has evaluated clinician-guided treatments. However, self-guided treatments, which do not involve contact with a clinician, have considerable public health potential and may be particularly advantageous for those patients who report stigma as a principal barrier to treatment. The findings of a recent trial of self-guided iCBT for symptoms of OCD highlighted the potential of this approach and found large within-group effect sizes from pre- to post-treatment on the YBOCS-SR ($d = 1.37$), sustained at 3-month follow-up ($d = 1.17$). In addition, 32% of participants met criteria for clinically significant change at 3-month follow-up. The present study reports the long-term outcomes of that trial ($N = 28$). Twelve out of 28 participants (43%) completed the 12 month follow-up. A large within-group effect size was found on the YBOCS-SR ($d = 1.08$) and 33% met criteria for clinically significant change at 12-month follow-up. No significant changes in symptoms were found between 3-month follow-up and 12-month follow-up, demonstrating that participants maintained their treatment gains in the long term. These results add to the emerging literature supporting the potential of self-guided iCBT for individuals with symptoms of OCD.

1. Introduction

Obsessive–compulsive disorder (OCD) is characterized by intrusive obsessions and related, anxiety reducing compulsions (APA, 2013). Effective cognitive-behavioral treatments for OCD exist and are well documented in the literature (Olatunji et al., 2013; Sánchez-Meca et al., 2014). However, there are numerous barriers to accessing traditional face-to-face treatments, including the direct and indirect costs of treatment, stigma, and difficulty accessing a trained therapist (Baer and Minichiello, 2008; Belloch et al., 2009; Goodwin et al., 2002; Marques et al., 2010). Internet-delivered cognitive behavioral therapy (iCBT) has increasingly been studied in recent years as a potential way to overcome many of these barriers.

Internet-delivered cognitive behavioral therapy involves the same evidence-based treatment techniques that are delivered in traditional face to face treatments; however, the treatment information is provided online (Andersson and Titov, 2014). Internet-delivered cognitive behavioral therapy can be clinician-guided (i.e., with clinician contact provided via telephone or email) or self-guided (i.e., without any clinician contact). To date, the majority of the studies examining iCBT for OCD have examined guided interventions, involving at least weekly clinician contact (Andersson et al., 2011, 2012; Lenhard et al., 2014; Wootton et al., 2011, 2013), or contact with a technician (Mahoney et al., 2014). Several studies now support the efficacy of clinician-guided iCBT for OCD with effect sizes, across three different research groups, ranging from 0.87 to 2.29 on relevant OCD outcome measures (Andersson et al., 2011, 2012; Lenhard et al., 2014; Mahoney et al., 2014; Wootton et al., 2011, 2013). While the results of these studies are encouraging, self-guided interventions have an important advantage over guided treatments including that they may be more attractive to patients who have significant concerns regarding stigma than guided treatments.

One recent study reported the results of two open trials exploring the efficacy of a new iCBT intervention for OCD, the OCD Course, when provided in a self-guided format (Wootton et al., 2014). Entry to both studies required a score of ≥16 on the self-report Yale–Brown Obsessive Compulsive Scale (YBOCS-SR) (Baer, 1991) and no clinician contact or support was provided to participants during assessment or treatment. In the first open trial ($N = 20$), 44% of participants completed the OCD Course within 8 weeks and significant improvements in OCD symptoms were observed from pre-treatment to post-treatment ($d = 1.05$) and to 3-month follow-up ($d = 1.34$) (Wootton et al., 2014). In the second trial ($N = 28$), the time allowed to complete the intervention was increased (i.e., from 8 weeks to 10 weeks) to allow more practice of exposure and response prevention (ERP) tasks. Sixty-four percent of participants

* Corresponding author at: School of Medicine (Psychology), University of Tasmania, Locked Bag 30, Hobart, TAS 7001, Australia.
E-mail address: bethany.wootton@utas.edu.au (B.M. Wootton).

http://dx.doi.org/10.1016/j.invent.2015.05.003

completed this revised OCD Course within the 10 week timeline and significant reductions in symptoms of OCD were also found with large effect sizes obtained at post-treatment ($d = 1.37$) and 3-month follow-up ($d = 1.17$) (Wootton et al., 2014). Importantly, participants in these open trials reported the iCBT Course to be acceptable. At post-treatment 80% of participants in the first trial indicated that it was *worth their time* taking part in the Course, which increased to 100% in the second trial. In addition, 80% of participants in the first open trial indicated that they would *recommend the Course to a* friend and this percentage increased to 100% in the second trial.

Currently, one of the limitations of the self-guided iCBT literature is the lack of long-term follow-up data. Recently, Andersson and colleagues reported the long-term outcomes for a randomized controlled trial (RCT) of clinician-guided iCBT for OCD (Andersson et al., 2014). Participants in this RCT were randomized, at post-treatment, to either receive no additional contact after treatment or to receive an internet-delivered booster program, and were followed up at 4-, 7-, 12- and 24-months post-treatment (Andersson et al., 2014). Results from this study indicated that both groups maintained their treatment gains with within-group effect sizes ranging from 1.58 to 2.09 across the follow-up time period (Andersson et al., 2014). Thus, there is emerging evidence to suggest that the clinical outcomes of clinician-guided iCBT for OCD are maintained over the longer term.

The aim of the present study was to extend the existing literature by reporting the long-term follow-up of self-guided iCBT for OCD. It was hypothesized, based on recent findings in the literature, that participants would maintain treatment gains at 12-months post-treatment.

2. Method

2.1. Participants

The original trial comprised a single-group feasibility open trial involving 28 participants who commenced a modified version of the OCD Course (Wootton et al., 2014). Participants applied online and completed self-report measures of OCD symptoms at pre-treatment, post-treatment and 3-month follow-up. The specific inclusion and exclusion criteria and short term outcomes are detailed in the original report (Wootton et al., 2014). Applicants were required to score ≥16 on the YBOCS-SR at application in order to participate and the researchers had no clinical contact with participants via telephone or email during the trial (Wootton et al., 2014). The 28 participants were followed up 12-months after the completion of the iCBT Course and this data is reported in the current study. Participant flow can be seen in Fig. 1 and the characteristics of the sample can be seen in Table 1. The study was approved by the Human Research Ethics Committee of Macquarie University and was registered with the Australian and New Zealand Clinical Trials Register (ACTRN12612000954820).

2.2. Outcome measures

Participants were administered the following self-report outcome measures: 1) The Yale Brown Obsessive Compulsive Scale — Self-Report Version (YBOCS-SR) (Baer, 1991), a 10-item questionnaire that measures the severity of OCD symptoms independently of the symptom subtype. Cronbach's alpha (α) was .73 in the current study. 2) The Dimensional Obsessive Compulsive Scale (DOCS) (Abramowitz et al., 2010), a 20-item scale that measures four empirically validated dimensions of OCD (i.e., contamination, responsibility for harm, ordering, and unacceptable thoughts). The internal reliability for the total score of this measure (α) in the current study was .86. 3) The Patient Health Questionnaire (9 item) (PHQ-9) (Kroenke et al., 2001), a widely used 9-item questionnaire measuring symptoms of depression. Total scores range from 0 to 27, and α in the current study was .83.

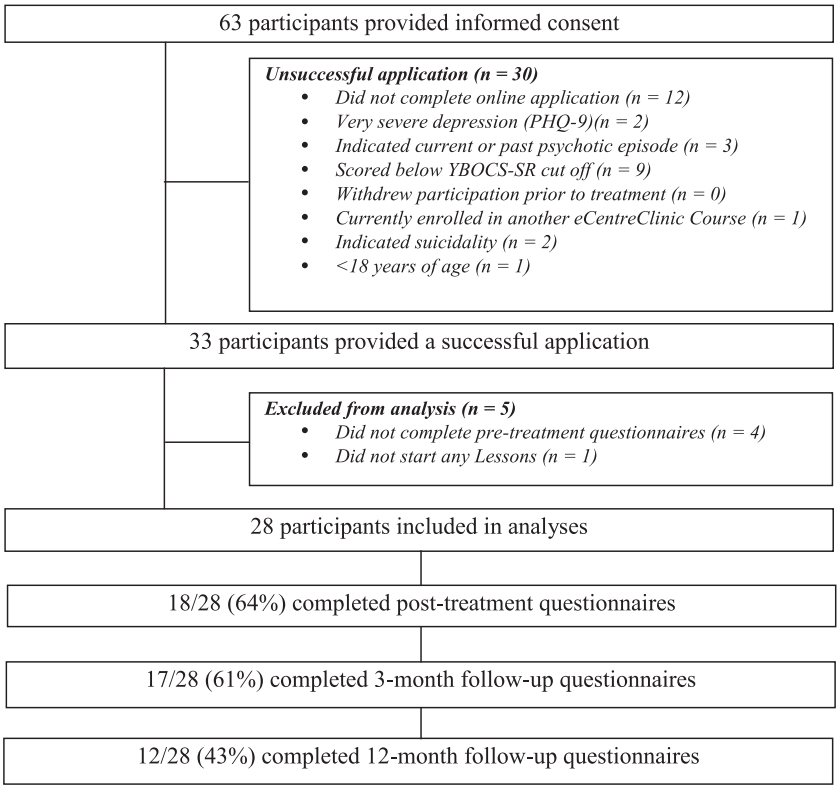

Fig. 1. Participant flow. PHQ-9: Patient Health Questionnaire, 9-item; YBOCS-SR, Yale–Brown Obsessive Compulsive Scale — Self Report. Being a self-guided treatment focussed on OCD, participants were excluded if they scored above a total score >22 or response >2 on Question 9 (suicidal ideation) of the PHQ-9.

Table 1
Demographic characteristics of the sample at pre-treatment (N = 28).

Variable	*N*	%
Gender		
Male	9	32.1
Female	19	67.9
Age		
Mean (SD)	35.90 (11.23)	–
Range	19–62	–
Marital status		
Single/never married	14	50.0
Married/de-facto	12	42.9
Separated/divorced/widowed	2	7.1
Education		
High school	4	14.3
Technical certificate	8	28.6
Tertiary	16	57.1
Employment		
Employed	16	57.1
Unemployed	12	42.9
Previous treatment (% yes)[a]	22	78.6
Psychotropic medication (% yes)	9	32.1
YBOCS-SR severity		
Mild	3	10.7
Moderate	19	67.9
Severe	5	17.9
Extreme	1	3.6
DOCS dominant subtype[b]		
Contamination/washing	7	25.0
Harming/checking	7	25.0
Ordering/arranging	9	32.1
Thoughts/mental rituals	11	39.3

Note. Standard deviations are indicated in parentheses. YBOCS-SR: Self-Report Yale Brown Obsessive Compulsive Scale. DOCS: Dimensional Obsessive-Compulsive Scale.
[a] Specific detail on the type of previous treatment obtained is unavailable.
[b] Percentages on the DOCS do not add to 100% as some participants indicated multiple dominant symptom domains.

2.3. Intervention

The treatment protocol is a 6-lesson iCBT program, the OCD Course, which is provided over 10 weeks. Each lesson is released serially according to a timeline and participants can only access later lessons after completing earlier lessons. Lesson 1 (released week 1) provides psycho-education, Lesson 2 (released week 2) provides information on cognitive distortions in OCD, Lesson 3 (released week 4) includes information on physical symptoms of anxiety and depression, Lessons 4 (released week 5) and 5 (released week 7) include information and instruction on exposure and response prevention and Lesson 6 (released week 8) provides information about relapse prevention. Each lesson includes assigned homework tasks, and participants are instructed to practice their homework tasks for at least 1 h per day. During treatment participants also receive regular automated emails notifying them of new course materials and reminding them when they have not completed a lesson. No clinician contact was provided during the treatment or follow-up period.

2.4. Data analysis

Changes over time were analyzed using mixed linear model (MLM) analyses using an autocorrelated covariance structure. Effect sizes (Cohen's *d*) and 95% confidence intervals were calculated for within-group changes, based on the pooled standard deviation for the entire sample (i.e., using the estimated marginal means from the MLM) and completer sample (i.e., those who completed the 12-month follow-up questionnaires). Reliable change (improvement or deterioration) was measured using the reliable change index (RCI) (Jacobson and Truax, 1991) criteria (a reduction or increase of at least 5 points on the YBOCS-SR). Clinically significant change was defined as a score 2SD below the pre-treatment mean on the YBOCS-SR (a score of ≤11 in this case) in addition to meeting the reliable change index (RCI) criteria. In these analyses, the last available scores were carried forward for anyone who did not complete the 12-month follow-up questionnaires (i.e., last observation carried forward; LOCF).

3. Results

Twelve-month follow-up data was obtained from 12/28 (43%) participants. The immediate (pre-treatment to post-treatment) and short-term follow-up (pre-treatment to 3-month follow-up) results are described elsewhere (Wootton et al., 2014). Means, standard deviations and effect sizes (with 95% confidence intervals) for the primary and secondary outcome measures are shown in Table 2.

A statistically significant effect for time was found for the YBOCS-SR ($F_{(12,154)} = 2.27$, $p = .01$) indicating that participant symptoms decreased from pre-treatment to 12-month follow-up. There was no significant difference between participant symptom scores at 3-month follow-up and 12-month follow-up ($p = .29$) indicating that participants had maintained their treatment gains at the 12-month follow-up. Similarly, for the secondary outcome measures there was a significant effect for time on the DOCS Main subscale (the participant's primary symptom domain) ($F_{(4,62)} = 6.27$, $p < .001$), as well as the contamination subscale ($F_{(4,64)} = 2.87$, $p = .03$), and responsibility subscale ($F_{(4,62)} = 3.75$, $p < .001$). There was no significant difference in DOCS Main, contamination, or responsibility subscale scores between 3-month follow-up and 12-month follow-up ($p > .05$). There was no significant effect for time effect for any the other DOCS subscales, DOCS total scores or the PHQ-9 at 12-month follow-up ($p > .05$).

Nine of the 28 participants (32%) met criteria for reliable improvement at 12-month follow-up and 1/28 (4%) met criteria for reliable deterioration when using the LOCF. Four of the 12 (33%) participants met criteria for clinically significant change at 12-month follow-up (completer sample), and 7/28 (25%) participants met criteria at 12-month follow-up when using the LOCF.

4. Discussion

The aim of this study was to investigate the long term efficacy of self-guided iCBT for symptoms of OCD. Twelve of the original 28 participants (43%) completed the 12-month follow-up measures, and as a result of the high rate of attrition results should be interpreted as preliminary. It was hypothesized that clinical outcomes would be maintained at 12-month follow-up, and using both completer and mixed model analyses, this hypothesis was supported, with a significant reduction in scores from pre-treatment to 12-month follow-up, and no significant change from 3-month follow-up to 12-month follow-up. The effect size on the primary outcome measure (YBOCS-SR) was large for the completer sample (i.e., $d = 1.08$) and moderate for the intent-to-treat sample (i.e., $d = 0.63$). Reflecting this, 33% of respondents using the conservative LOCF method met criteria for clinically significant change at 12-month follow-up. The outcomes in the current study are similar to the only other study to examine the long-term efficacy of clinician-guided iCBT for OCD (Andersson et al., 2014) and extend on the findings of that study by highlighting the outcomes of self-guided iCBT for OCD which are also maintained over the longer-term, albeit with a higher attrition rate.

While the findings of the current study are encouraging, it is important to note that there was considerable variability in treatment response. For example, some participants achieved the criteria for reliable change (32% met RCI improvement), others not benefitting at all (64% did not meet RCI criteria), and one participant (4%) indicated symptoms that met criteria for reliable deterioration. This is not unique to self-guided iCBT for OCD but does highlight one of the most important issues facing the development and routine use of self-guided iCBT for OCD, specifically, understanding who benefits from this approach, what features of iCBT interventions for OCD are important for optimal

Table 2
Means, standard deviations and effect sizes (Cohen's *d*) for the outcome measures.

Measure	Pre-treatment	Post-treatment	3-month follow-up	12-month follow-up	Effect size Pre-treatment to 12-month follow-up	Effect size 3-month to 12- month follow-up
Completer sample						
YBOCS-SR	20.79 (4.71)	13.56 (6.07)	14.28 (6.70)	14.83 (7.13)	1.08 (0.34–1.77)	−0.08 (−0.81–0.65)
DOCS Main	11.96 (3.77)	7.28 (3.09)	7.86 (4.34)	7.19 (3.43)	1.30 (0.54–2.00)	0.17 (−0.57–0.89)
DOCS Total	26.36 (12.53)	19.65 (11.14)	19.50 (11.71)	19.75 (14.56)	0.50 (−0.19–1.18)	−0.02 (−0.75–0.71)
DOCS — Contamination	5.75 (5.60)	4.67 (4.06)	4.06 (3.62)	4.83 (4.00)	0.18 (−0.50–0.85)	−0.20 (−0.92–0.54)
DOCS — Responsibility	8.18 (5.54)	5.72 (4.18)	6.50 (5.12)	4.50 (4.60)	0.70 (−0.01–1.38)	0.41 (−0.36–1.11)
DOCS — Thoughts	6.50 (5.95)	4.56 (4.03)	4.67 (4.21)	5.50 (4.83)	0.18 (−0.50–0.85)	−0.19 (0.19–0.56)
DOCS — Ordering	5.93 (5.14)	4.94 (4.56)	4.28 (3.79)	4.92 (4.91)	0.20 (−0.48–0.87)	−0.15 (0.87–0.59)
PHQ-9	9.64 (5.36)	5.72 (5.06)	7.89 (6.14)	7.91 (6.68)	0.30 (−0.39–0.97)	0.00 (−0.74–0.73)
Estimated marginal means						
YBOCS-SR	20.79 (5.89)	14.88 (6.83)	15.45 (6.78)	16.65 (7.15)	0.63 (0.09–1.16)	−0.17 (−0.69–0.35)
DOCS Main	11.96 (4.07)	8.44 (4.71)	8.75 (4.71)	8.41 (5.08)	0.77 (0.22–1.30)	0.07 (−0.46–0.59)
DOCS Total	26.36 (12.78)	22.34 (14.55)	20.97 (14.44)	19.71 (15.22)	0.47 (−0.06–1.00)	0.08 (−0.44–0.61)
DOCS — Contamination	5.75 (5.06)	4.67 (5.56)	3.82 (5.54)	3.39 (5.75)	0.44 (−0.10–0.96)	0.08 (−0.45–0.60)
DOCS — Responsibility	8.18 (5.24)	6.54 (5.95)	6.82 (6.00)	4.86 (6.39)	0.57 (0.03–1.09)	0.32 (−0.22–0.84)
DOCS — Thoughts	6.50 (5.75)	5.60 (6.19)	5.75 (6.21)	5.99 (6.40)	0.08 (−0.44–0.61)	−0.04 (−0.56–0.49)
DOCS — Ordering	5.93 (4.69)	5.35 (5.06)	4.57 (5.06)	5.45 (5.21)	0.10 (−0.43–0.62)	−0.17 (−0.69–0.36)
PHQ-9	9.64 (5.29)	6.00 (6.06)	8.26 (6.01)	9.08 (6.27)	0.10 (−0.43–0.62)	−0.13 (−0.66–0.39)

Note. The *N* for the completer sample was pre-treatment ($N = 28$), post-treatment ($N = 18$), 3-month follow-up ($N = 18$) and 12-month follow-up ($N = 12$). YBOCS-SR: Self-Report Yale Brown Obsessive Compulsive Scale. DOCS: Dimensional Obsessive Compulsive Scale. PHQ-9: Patient Health Questionnaire — 9 item.

outcomes, and incorporating mechanisms for identifying people who may require support from a health professional and making such help available. There is currently little empirical understanding about who responds to iCBT treatment. It is likely that a combination of an individual's characteristics and specific treatment components are important in determining who will benefit from iCBT and these characteristics and features may differ depending on whether iCBT is delivered in a clinician or self-guided format, as well as the circumstances of the individual. For example, recent studies have found that regular automated emails delivered during a self-guided iCBT course only enhanced completion rates and clinical outcomes when participants had comorbid anxiety and depression (Titov et al., 2013, 2014). In that instance the authors argued that regular automated emails helped to overcome the severity of symptoms, which would otherwise have compromised engagement with treatment. Future research should focus on understanding these issues so that we can appropriately and safely target self-guided iCBT treatments at those people most likely to respond. This knowledge is important for the safe and effective dissemination of self-guided iCBT treatment. This is also an important economic issue given that the overall cost-effectiveness of treatment for OCD can be improved by providing the most appropriate intervention based on the level of need of the patient (Diefenbach and Tolin, 2013).

Despite the promising findings of this study there are a number of important limitations. First, is the high attrition rate with only 43% of participants completing the 12-month follow-up questionnaires. While attrition in long-term efficacy studies is common, our attrition is higher than those seen in other long-term efficacy studies of self-guided iCBT (Titov et al., 2014). The high rate of attrition in the current study does limit the strength of the conclusions that can be drawn from the data, and means that the results of the present study should be considered with caution. Second, is the absence of structured clinical interviews, which were omitted to avoid clinician contact and examine the intervention in a truly self-guided format. Third, to minimize burden on participants, the present study only examined outcomes on primary symptom measures and did not include other potentially important measures such as obsessive beliefs or quality of life measures. The inclusion of these, and other similar measures would have added to the current findings. Third, the present study employed a single group open trial design, which does not control for natural remission. Fourth, in contrast to previous studies (e.g., Andersson et al., 2012; Mahoney et al., 2014; Wootton et al., 2013), the present study did not find a significant reduction in symptoms of depression. However, it is important to note that the overall levels of depressive symptoms were subthreshold for diagnosis and, thus, depressive symptoms were not a relevant outcome for many participants. Finally, the study did not assess help-seeking behavior after the treatment period ended. Consequently, it is possible that the long term gains seen in this study could be due to another type of treatment that the participant obtained after the program ended. Importantly, a large randomized controlled trial of self-guided iCBT for OCD is currently underway by the research team and these limitations will be addressed in this more robust design.

While further research is required to investigate the long-term efficacy of self-guided iCBT for OCD the results of the current study provide preliminary evidence indicating that gains made in an entirely self-guided iCBT course may be sustained up to 12-months after treatment with approximately one quarter to one third of individuals meeting a conservative criteria for treatment recovery. When considering the low cost associated with self-guided treatments, this study has important implications for improving access to treatment for individuals with OCD, especially those who are reluctant to seek help due to stigma.

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