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Publisher: Routledge

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## Counselling and Psychotherapy Research: Linking research with practice

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/rcpr20>

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Version of record first published: 12 Oct 2012.

To cite this article: Derek Richards, Ladislav Timulak & David Hevey (2012): A comparison of two online cognitive-behavioural interventions for symptoms of depression in a student population: The role of therapist responsiveness, *Counselling and Psychotherapy Research: Linking research with practice*, DOI:10.1080/14733145.2012.733715

To link to this article: <http://dx.doi.org/10.1080/14733145.2012.733715>



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RESEARCH ARTICLE

## A comparison of two online cognitive-behavioural interventions for symptoms of depression in a student population: The role of therapist responsiveness

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### Abstract

*Objectives:* The study aimed to compare the efficacy of eight weekly sessions of a self-administered online CBT treatment (cCBT;  $n = 51$ ) to a therapist-assisted email CBT treatment (eCBT;  $n = 50$ ) in University students. *Design:* The design was a randomised parallel group trial. The study randomised participants with symptoms of depression to one of two available treatments. *Method:* Participants were offered eight weekly sessions of either cCBT or eCBT. Participants completed the Beck Depression Inventory-II (BDI-II) and the Clinical Outcomes in Routine Evaluation – Outcome Measure (CORE-OM) at pre-and post-treatment, at weeks 16 and 32 follow-up. The Working Alliance Inventory-Short Form (WAI-SR) was completed at weeks 2, 4, and 6. *Results:* For both groups, pre-post within group effect sizes reported were large for the BDI-II and the CORE-OM and these were maintained at follow-up. Perceptions of working alliance were similar in each group, but Bond was significantly stronger for the eCBT condition. WAI scores correlated more positively with the outcome on BDI-II for those in the eCBT condition than the cCBT condition, but not significantly. *Conclusion:* There were no significant differences between the two online treatments, both reduced depressive symptoms and improved general functioning. Similarly, at post-treatment and follow-up, clinical improvement and recovery was demonstrated for both groups equally. The study demonstrates the possibility for cCBT in a university setting that may contribute to addressing the shortcomings in meeting increasing demands that mental health services presently face.

**Keywords:** online treatments for depression; online interventions; randomised trial; cognitive behaviour therapy; depression treatment; therapist responsiveness

### Introduction

Depression is a serious and growing problem worldwide, displaying high rates of lifetime incidence, early age onset, high chronicity, and role impairment (Richards, 2011). The World Health Organisation has ranked depression as the single most burdensome disease in the world (Gotlib & Hammen, 2002). Epidemiologic studies have also been responsible for highlighting the occurrence of depression in younger age groups (Murray & Lopez, 1996).

Academic stress, transition, isolation, financial worry, among other factors means Higher Education

(HE) is associated with an increase in emotional distress (Dyson & Renk, 2006; Royal College of Psychiatrists, 2003). Not surprisingly several studies have reported elevated levels of depression in third-level students (Royal College of Psychiatrists, 2003). In recent years, University mental health services in the UK and US have noted an increase in user numbers and severity of presentation (Mowbray et al., 2006; Rana, Smith, & Wlaking, 1999). The noted rise in demand is not being met by a commensurate increase in human resources, consequent waiting lists ensue which contradict the benefits of early intervention; solutions are therefore

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sought (Rana et al., 1999; Royal College of Psychiatrists, 2003).

Cognitive behaviour therapy (CBT) is an established option for the treatment of depression (Hollon & DeRubeis, 2006). However, many with depression do not receive the treatment they need; barriers to accessing treatment include a shortage of trained professionals, waiting lists, costs, and personal barriers such as stigma (Kohn, Saxena, Levav, & Saraceno, 2004). The delivery of tailored CBT treatment programmes using the internet is one attempt to overcome barriers to access (Marks, Cavanagh, & Gega, 2007). Research on computerised-cognitive behaviour therapy (cCBT) for depression supports its efficacy (Richards & Richardson, 2012). Supported treatments achieve significant post-treatment effects ( $d = .56$ ), yet, given the demand for depression treatment, the effects achieved ( $d = .36$ ) for non-supported treatments cannot be ignored (Richards & Richardson, 2012).

The role of extra therapeutic factors in cCBT, such as the working alliance has yet to be established. However, a recent study found that alliance ratings for online CBT are in line with face-to-face studies yet, therapeutic alliance as measured by the WAI is probably less important in online CBT than in regular face-to-face psychotherapy (Andersson et al., 2012).

Developments in cCBT may be pertinent for young adult students, who may demonstrate a preference for online formats over traditional services (Ryan, Shochet, & Stallman, 2010). Perhaps cCBT in university mental health services may serve in meeting the increasing demands that services presently face (Mowbray et al., 2006; Rana et al., 1999).

### *Research questions and hypothesis*

In the context of a university student population, the study thus sought to address: first, is there a difference in efficacy between online treatments where one is therapist-delivered and the other is self-administered? Second, are there any differences between the clients perception of working alliance levels in each of the two groups? Third, how does alliance at different points in the therapy in each of the conditions correlate with the level of depressive symptoms at the end of treatment? To summarise, we hypothesised that both treatment conditions would be efficacious, but that the

therapist-supported eCBT would demonstrate greater improvement.

## **Method**

### *Participants*

Between March 2008 and June 2009, registered students at an Irish University (c.15,000) were eligible to participate. In three recruitment phases, 248 self-referred and applied to be screened. Principally, applicants with BDI-II scores  $\leq 14$  or  $> 29$  were excluded from the study as they were deemed to have less than mild or severe depression symptoms (Beck, Steer, & Brown, 1996).

### *Sample*

Figure 1 details the flow of participants through the trial, including reasons for exclusion. While 101 participants were randomised and offered treatment, 21 participants did not start the treatment. Participants ( $n = 80$ :  $n = 37$  in eCBT and  $n = 43$  in cCBT) were mainly female (62%) and the mean age was 26.45 years ( $SD = 7.5$ ; Range: 19–59).

### *Procedure*

In a face-to-face meeting with a clinician, students provided consent and completed the screening measures online. The BDI-II and CORE-OM were administered at baseline, post-treatment, and at weeks 16 and 32 follow-up. The WAI-SR was administered at weeks 2, 4 and 6. The instructions for the WAI-SR were tailored for each of the groups. First, the eCBT group: ‘consider the counsellor who is corresponding with you by e-mail in answering the following inventory’; second, for the cCBT group: ‘consider the programs voiceover as your counsellor.’ Participants completed all measures online.

### *Measures*

*Brief Symptom Inventory (BSI; Derogates, 1977).* The BSI was used at baseline screening: cut-off scores for exclusion were established for items related to item 3 psychoticism (score of 2 or above), item 9 suicidal ideation (score of 1 or above), and item 24 paranoid ideation (score of 1 or above). For the current sample high reliability was established (Cronbach’s  $\alpha = .95$ ).

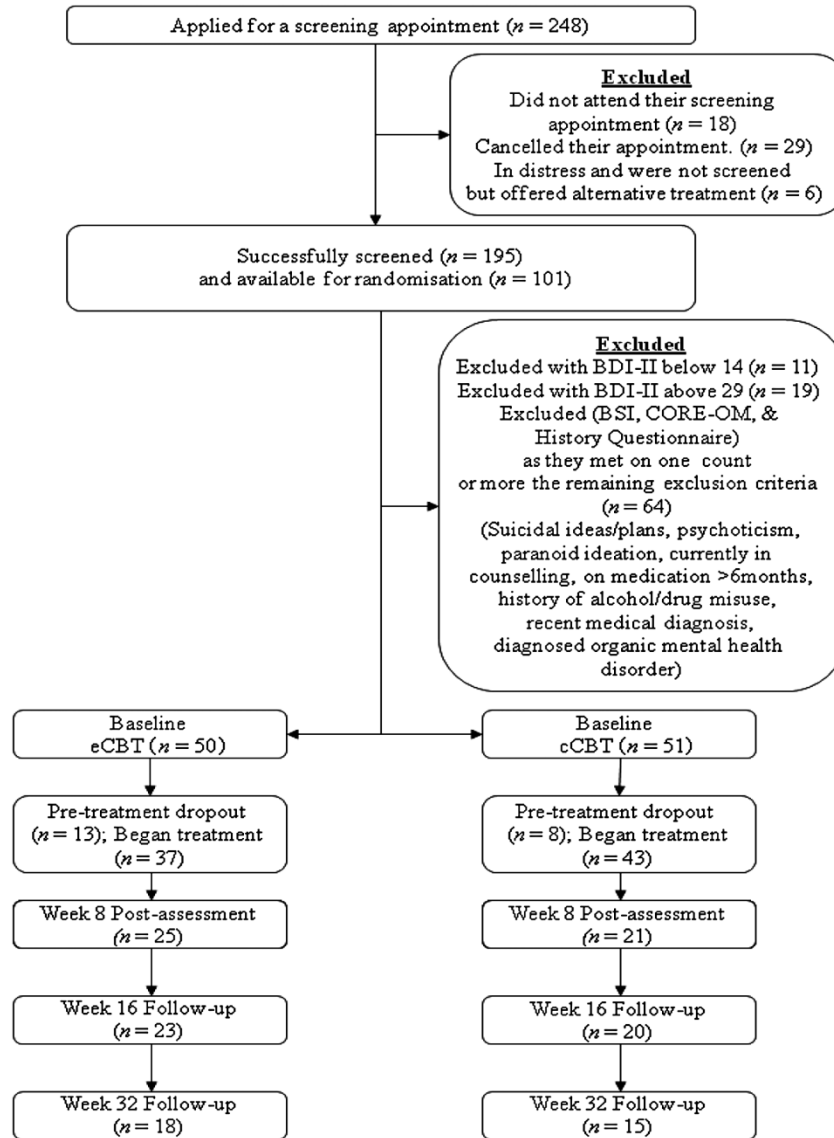


Figure 1. Flow of participants through the trial.

*Beck Depression Inventory (BDI-II; Beck, et al., 1996).* The BDI-II was employed at baseline, at post-treatment and follow-up. Alongside the established range ( $\leq 14$  or  $> 29$ ), cut-off scores for exclusion were established for items 9 related to suicidal ideation (score of 2 or above), and item 2, pessimism (score of 3 or above). The BDI for the study sample demonstrated high reliability (Cronbach's  $\alpha = .88$ ).

*Clinical Outcomes in Routine Evaluation – Outcome Measure 10 (CORE-OM – 10; Connell & Barkham, 2007).* The CORE-OM – 10 was used for baseline assessment, at post-treatment and follow-up. It comprises items on symptoms of depression and anxiety, on general functioning, social relationships

and close relationships, items on trauma, on physical symptoms and on risk. An exclusion score of above 0 was established for item 6, on suicidal plans. The measure reached satisfactory reliability for the current sample (Cronbach's  $\alpha = .77$ ).

*History Questionnaire (HQ).* The HQ was used for baseline screening purposes. It collected information on the participants: (1) their previous experience of counselling/therapy and (2) if they were on medication for depression. At baseline screening participants were excluded if (3) they were currently in counselling, or (4) on medication for  $> 6$  months, and also (5) if participants answered positively to the item on alcohol and drug misuse, (6) depression coinciding with a recent medical diagnosis, or (7) the

presence of a diagnosed organic mental health condition.

*The Working Alliance Inventory – Short Revised (WAI-SR; Hatcher & Gillaspy, 2006).* The WAI-SR comprises 12 items which assesses alliance in three subscales: Goals, Tasks, and Bond. The measure for the study sample showed high reliabilities for week 2 (Cronbach's  $\alpha = .86$ ), week 4 (Cronbach's  $\alpha = .87$ ), and week 6 (Cronbach's  $\alpha = .84$ ).

*Responsiveness Adherence Measure.* The CBT content in both groups was identical. However the variable that was different and changeable was the therapist for the eCBT group. Consequently the Adherence Measure assessed the relational and technical skills regarding the appropriateness of the match between the issues that participants disclosed in their free-text and the therapists' response to that material, i.e., therapist responsiveness. The measure was developed from the previous experience of the therapists in online counselling. Five items assessed aspects of therapists responsiveness using a nominal scale ('Present' or 'Absent'): (1) empathy and acknowledgement of emotions, (2) provision of guidance and information, (3) validation of successes, (4) promotion of self-care and social support, and (5) building alliance. If the five aspects of the therapist's generic skills were present adequately in their response to the participant's presentation then the score would be 5.

Participants in the eCBT condition accumulated 147 sessions and using two raters (counselling psychologists) the adherence measure was applied to a pragmatic sample of 48 (33%) randomly chosen submissions and therapists responses from both therapists working as part of the trial. The global mean returned for all analysis combining each rater was 4.78 ( $SD = 0.014$ ) (out of a maximum of 5), suggesting that the raters saw all five of the expected relational and technical skills present in almost all of the scripts. For each of the five items comprising the adherence measure means ( $M$ ) and reliability values using Cohen's Kappa coefficient ( $\kappa$ ) were calculated. Based on the measurement of observer agreement for categorical data (Landis & Koch, 1977), three of the items (empathy and acknowledgement of emotions [ $M = 4.6$ ;  $\kappa = .484$ ], validation of participant's successes [ $M = 4.6$ ;  $\kappa = .478$ ], encouraging self-care and social support [ $M = 4.6$ ;  $\kappa = .478$ ]) displayed moderate agreement and the remaining two (the provision of guidance and information [ $M = 4.5$ ;  $\kappa =$

.647], and building alliance [ $M = 4.6$ ;  $\kappa = .657$ ]) yielded substantial agreement among the raters.

### Design

The design was a randomised parallel group trial. After baseline screening eligible participants were randomised to either self-administered computerised CBT (cCBT) or asynchronous therapist-delivered e-mail CBT (eCBT). Randomisation was accomplished using a random-assignment algorithm independent of the researchers. Participants who were ineligible were excluded and offered appropriate support.

### Interventions

*Self-administered computerised CBT (cCBT; Beating the Blues™).* The treatment, Beating the Blues™ (Proudfoot et al., 2004) consisted of eight sessions during which users identified specific problems and realistic treatment goals. They worked through cognitive modules including the identification and challenging of automatic thoughts and problem-directed behavioural modules such as activity scheduling and problem solving. The program uses interactivity, animations and voice-overs and includes a series of filmed case studies of fictional patients who model the symptoms of depression and help demonstrate the treatment by cognitive behavioural therapy. The program has been recommended as a treatment option for people with mild or moderate depression (National Institute for Health and Clinical Excellence, 2006).

*Therapist-delivered e-mail CBT (eCBT).* The treatment consisted of eight sessions. Each session consisted of two components: a text version of the Beating the Blues™ protocol (in email format where all multimedia elements such as the filmed case studies were delivered in text); and an opportunity for participants to write in free-text about issues that concerned them. The reply from the counsellor included a tailored response to their free-text alongside the specific CBT content for each session.

The therapists tailored response to the participants' free text in the eCBT condition represented 'therapist responsiveness' (Stiles, Honos-Webb, & Surko, 1998). A trained therapist potentially brings to bear relational skills which largely concern the development of a working alliance (therapeutic relationship) and technical skills that concern the

responsive and tailored engagement with the participants' free-text content. Although these relational and technical skills can be present in online *self-administered* CBT treatments, we assumed that they would not be present to the same extent as in an online *therapist-delivered* CBT treatment. We hypothesised that therapist responsiveness could enhance an online treatment outcome, partially basing this hypothesis on the fact that working alliance is a factor robustly related with positive therapeutic outcomes (Martin, Garske, & Davis, 2000) and partially basing it on the larger effect sizes reported in therapist-supported online depression treatment studies (Richards & Richardson, 2012).

### Therapists

Two therapists delivered the eCBT. One was in her 60s, family therapy trained with many years experience and the other in her late 20s, a fully qualified counselling psychologist. Both were female, Caucasian and Irish. Both had specialist training in online counselling and their experience in online counselling was three and 1.5 years respectively.

### Data analysis

Following best practice standards, we performed all analyses on the intention-to-treat sample; the analyses therefore including those who began treatment and provided follow-up data irrespective of treatment compliance. Effects were tested at the .05 level (two-tailed). Baseline differences in demographic and clinical characteristics were investigated using t-tests.

To test the main hypotheses, mixed ANOVAs were performed for both BDI-II and CORE-OM. Cohen's *d* statistic assessed the magnitude of the within-group effects (Cohen, 1988). The magnitude of between-group effects was established by subtracting the Cohen's *d* statistic for the two groups.

The proportion of participants who made reliable and clinically significant change, those who recovered and improved and those who made no change or deteriorated at the end of treatment and at week 16, and week 32 follow-up was estimated. The analysis for recovery was conducted using the criteria defined as a post-treatment score less than 10 on the BDI-II (Beck et al., 1996) and a corresponding decrease of greater than 9 points on the BDI-II (Seggar, Lambert, & Hansen, 2002). Improved was defined as a movement of 9 points on

the BDI-II and a score greater than 10. No change was defined as where the magnitude of change on the BDI-II was less than 9 change points. Deterioration was defined as an upward change in score on the BDI-II greater than 9 points. Chi-square tests examined the association between treatment group and levels of change.

Differences in the client rated WAI-SR subscales scores between groups were assessed using independent samples t-tests. WAI-SR scores at sessions 2, 4 and 6 were also correlated with outcomes on the BDI-II at post-treatment, week 8.

### Ethics

Ethical approval was received for the study from the appropriate University Ethics Committee. Delivering interventions online bring many ethical concerns (Richards & Viganó, 2012). The protocol for the current study was revised several times after presenting to various professionals. All clients at risk were followed-up, and the initial screening took place face-to-face.

## Results

### Baseline characteristics

Independent samples t-tests revealed that there were no significant differences between the 101 randomised and the 80 who began treatment on all baseline variables.

### Treatment response rate

Mean number of sessions completed for each condition was eCBT: 3.97 ( $SD = 2.2$ ) and cCBT: 4.05 ( $SD = 2.9$ ). Table I shows dropout from session to session, chi-square tests revealed an association between the groups and dropout rate only for session

Table I. Treatment response rates.

	Both ( $N = 80$ )		eCBT ( $n = 37$ )		cCBT ( $n = 43$ )	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Session 1	80	100%	37	100%	43	100%
Session 2	64	80%	35	95%	29	67%
Session 3	48	60%	24	65%	24	56%
Session 4	40	50%	20	54%	20	47%
Session 5	30	37%	11	30%	19	44%
Session 6	24	30%	9	24%	15	35%
Session 7	19	24%	6	16%	13	30%
Session 8	16	20%	5	14%	11	26%

2,  $\chi^2(1; N=64)=9.16, p < .05$ ; 95% of the participants in the eCBT group completed session 2 compared to 67% of the cCBT group. Cramer's V statistic was .34 which represents a medium association between the group and whether session 2 was completed.

Overall dropout from treatment was high with only 20% completing the entire eight sessions (eCBT:  $n=5$ ; cCBT:  $n=11$ ). However, 30% of participants completed  $\geq 4$  but less than eight sessions (eCBT:  $n=15$ ; cCBT:  $n=9$ ), and 50% of participants completed between 1 and 3 sessions (eCBT:  $n=17$ ; cCBT:  $n=23$ ).

#### Research attrition

Figure 1 details the numbers who completed research measures from baseline to post-treatment to follow-up. It is the case that some participants stayed in treatment and did not complete the assessment measures; others discontinued the treatment but completed the assessment measures. Research attrition in the current study was high: 50% from pre- to post-assessments, and this rose to 60% at follow-up. Chi-square tests revealed no association between research retention rate and treatment groups for the main outcome measures BDI-II and CORE-OM,  $\chi^2(1; N=46)=2.85, p > .05$ , or the WAI-SR,  $\chi^2(1; N=39)=0.775, p > .05$ .

#### Outcomes on BDI and CORE-OM

The study sought to establish whether there was a difference in the efficacy of two online delivered treatment formats. The results showed that both treatment groups displayed significant statistical and clinical improvement in both depressive symptoms and general mental health functioning. The mixed ANOVA showed there was a significant overall improvement over time for both groups on the BDI-II,  $F(2,25,67.59)=6.872, p < .001$ . There were no significant group  $\times$  time interactions. Contrasts revealed that significant improvement occurred from baseline to week 8,  $F(1,30)=15.015, p < .001$ , and this was maintained at follow-up. The mixed ANOVAs results also showed a significant overall improvement over time for both groups on the CORE-OM,  $F(3,90)=5.056, p < .001$ . There were no significant group  $\times$  time interactions. Contrasts revealed that significant improvement was achieved from baseline to week 8,  $F(1,30)=4.910, p < .001$ , and this was maintained at follow-up.

Cohen's  $d$  statistic assessed the magnitude of within-group effects of each of the interventions and large pre-post effect sizes are noted for both conditions and maintained up to six months follow-up (Table II). The between-group effect sizes favoured the eCBT condition at each time-point for the BDI-II (week 8:  $d=.86$ ; week 16:  $d=.36$ ;

Table II. Descriptive data ( $M$ ,  $SD$ ,  $ES$  and  $CI$ ) for the BDI-II and CORE-OM by group over time.

Outcome measure	Pre-treatment score: $M$ ( $SD$ ), $N$	Post-treatment score: $M$ ( $SD$ ), $n$	Effect size ( $d$ ) [95% CI]	Follow-up assessments			
				Week 16 score: $M$ ( $SD$ ), $n$	Effect size ( $d$ ) [95% CI]	Week 32 score: $M$ ( $SD$ ), $n$	Effect size ( $d$ ) [95% CI]
<b>BDI-II</b>							
eCBT	22.70 (4.7) $n=37$	11.52 (4.9) $n=25$	2.30 [0.46, 4.22]	10.35 (4.9) $n=23$	2.48 [0.60, 4.48]	10.17 (5.4) $n=18$	2.48 [0.40, 4.97]
cCBT	21.72 (5.3) $n=43$	12.81 (6.9) $n=21$	1.44 [-0.72, 4.41]	10.50 (5.2) $n=20$	2.12 [-0.03, 4.40]	10.33 (7.5) $n=15$	1.81 [-0.77, 5.60]
<b>CORE-OM</b>							
eCBT	19.46 (4.5) $n=37$	11.24 (4.4) $n=25$	1.77 [0.05, 3.50]	11.09 (4.5) $n=23$	1.77 [-0.07, 3.61]	12.22 (3.4) $n=18$	1.72 [-0.36, 3.29]
cCBT	18.95 (5.3) $n=43$	12.52 (4.3) $n=21$	1.20 [-1.33, 3.04]	11.65 (4.6) $n=20$	1.28 [-1.31, 3.29]	12.53 (4.0) $n=15$	1.20 [-1.74, 3.22]

Note. BDI-II, Beck Depression Inventory; CORE-OM, Clinical Outcomes in Routine Evaluation – Outcome Measure; eCBT, Therapist-delivered e-mail CBT; cCBT, Self-administered computerised CBT; CI, Confidence Interval; Effect Sizes were calculated for the number of participants remaining who provided data at each time point e.g. week 8 eCBT = 25, week 32 cCBT = 15. Effect sizes for the follow-up assessments are for comparison with pre-treatment. All analysis used intent-to-treat sample, including those who began treatment and provided follow-up data irrespective of treatment compliance. The variance in numbers at each time-point shows that treatment attrition was high and also the research response, that is, the number of data collected differed at each time-point.

week 32:  $d = .67$ ) and also for CORE-OM (week 8:  $d = .52$ ; week 16:  $d = .49$ ; week 32:  $d = .52$ ).

#### *Reliable and clinically significant change*

Clinically significant and/or reliable changes for participants were estimated (Table III). No significant differences were found in the numbers recovered, improved or assessed as no change occurred between the groups at each time point: week 8,  $\chi^2(2; N=46) = .139, p > .05$ , week 16,  $\chi^2(2; N=41) = .001, p > .05$  and week 32,  $\chi^2(2; N=33) = .206, p > .05$ .

#### *The perceived level of alliance in each condition*

The study sought to assess whether there existed any differences between clients perception of working alliance levels in the different treatment formats. Analyses (Table IV) showed that Goal and Task elements of the alliance were present in both groups to a similar degree. Independent samples t-tests revealed Bond to be significantly stronger for the eCBT group at week 2,  $t(37) = 2.104, p < .05$ , week 4,  $t(29) = 2.402, p < .05$ , and week 6,  $t(19) = 1.593, p < .05$ .

#### *Outcome and therapeutic alliance correlations for each condition*

The study sought to determine whether there was an influence of WAI scores on outcome. Data from the WAI-SR was correlated with the BDI-II outcomes at post-treatment, week 8 (eCBT: week 2,  $r = -.269$ ; week 4,  $r = -.518$ , week 6,  $r = -.585$ ; cCBT: week 2,  $r = -.119$ ; week 4,  $r = -.050$ , week 6,  $r = -.373$ ). Although the correlations were stronger in the eCBT

group at each time-point, they did not reach significance for either group.

## **Discussion**

Despite high treatment and research dropout participants in both treatment groups who accessed treatment, partially or completely, and who provided post-treatment and follow-up data displayed significant statistical and clinical improvement in depressive symptoms and a corresponding improvement in general mental health functioning. The results support the hypothesis regarding the efficacy of the online treatments for moderately depressed university students who self-selected for online treatment.

The results for the eCBT group are in line with similar studies that provided therapist support (Ruwaard et al., 2009; Titov et al., 2010; Vernmark et al., 2010). The results for the cCBT group are larger than those in other unsupported online studies (de Graaf et al., 2009; Meyer et al., 2009). An obvious implication for practice is the potential to use cost-effective, self-administered interventions to compliment and extend services.

We did not identify any statistically significant differences between the two groups. It would seem that at least in the current sample the Beating the Blues™ protocol could be implemented as a therapist-delivered intervention, and have equal success to the more customary self-administered format. Although supported interventions generally yield greater results, the results from a self-administered intervention cannot be ignored (Richards & Richardson, 2012), especially in the face of the current prevalence of mental health disorders in students and the demands being placed on often stretched

Table III. Clinically significant and reliable change.

	Week 8, N = 46				Week 16, N = 41				Week 32, N = 33			
	eCBT n = 25		cCBT n = 21		eCBT n = 23		cCBT n = 20		eCBT n = 18		cCBT n = 15	
	n	%	n	%	n	%	n	%	n	%	n	%
Recovered	9	36%	6	29%	9	39%	7	35%	8	44%	6	40%
Improved	5	20%	6	29%	7	30%	7	35%	5	28%	4	27%
No change	11	44%	9	42%	7	30%	6	30%	5	28%	5	33%
Deteriorated	0		0		0		0		0		0	

Note. The criteria for recovery was defined as a post-treatment score less than 10 on the BDI-II (Beck et al., 1996) and a corresponding decrease of greater than 9 points on the BDI-II (Seggar et al., 2002). Improved was defined as a movement of 9 points on the BDI-II and a score greater than 10. No change was defined as where the magnitude of change on the BDI-II was less than 9 change points. Deterioration was defined as an upward change in score on the BDI-II greater than 9 points.



Table IV. Mean scores on each of the WAI-SR subscales: Goals, Tasks, and Bonds.

		Goal <i>M (SD)</i>	Task <i>M (SD)</i>	Bond <i>M (SD)</i>	Average <i>M (SD)</i>
eCBT ( <i>n</i> = 37)	Week 2 ( <i>n</i> = 20)	3.5 (1.29)	3.4 (1.27)	3.8 (1.16)*	3.6 (.78)
	Week 4 ( <i>n</i> = 14)	3.9 (.99)	3.7 (1.12)	3.9 (1.12)*	3.8 (.77)
	Week 6 ( <i>n</i> = 9)	3.8 (.96)	3.7 (1.54)	3.9 (.97)*	3.8 (.77)
	Average	3.7 (1.08)	3.6 (1.31)	3.9 (1.08)*	
cCBT ( <i>n</i> = 43)	Week 2 ( <i>n</i> = 19)	3.5 (1.34)	3.7 (1.32)	3.2 (1.24)	3.5 (.79)
	Week 4 ( <i>n</i> = 17)	3.7 (1.36)	4.0 (1.48)	2.9 (1.27)	3.5 (.84)
	Week 6 ( <i>n</i> = 12)	3.6 (1.15)	3.8 (1.24)	3.0 (1.31)	3.5 (.72)
	Average	3.6 (1.28)	3.8 (1.34)	(1.27)	

\*Statistically significant compared to cCBT group

mental health services (Mowbray et al., 2006; Rana et al., 1999).

At post-treatment more than half of participants in both groups were classified as being improved or recovered (see Table III) a result similar to other online studies for depression that included a control condition. For example, Titov et al. (2010) reported that 52% of participants improved or recovered in an online therapist-delivered CBT intervention. Meyer et al. (2009) used an unsupported intervention and reported that 42% improved or recovered at the end of the treatment. Additionally, the study shows some delayed effects as the number of recovered or improved increased with time (see weeks 16 & 32 Table III). Recovery from mental health problems and the maintenance of any recovery are key points for practice and the delivery of researched-informed interventions. CBT is an established option for the treatment of depression and maintenance of gains post-treatment (Hollon & DeRubeis, 2006); it would also seem that online delivered CBT interventions can achieve significant post-treatment and maintenance of outcomes for users.

The current study compared two delivery formats of a CBT intervention online, we did not include a control group, however, other studies of online CBT that included a waiting-list control group reported similar outcomes post-treatment and at follow-up (Titov et al., 2010; Vernmark et al., 2010), thus supporting the results reported for the current study. Several other research studies of online interventions for depression, both supported and unsupported, show that they can achieve significant results and their potential to increase access and complement other mental health services is worthy (Richards & Richardson, 2012).

The dropout rate of 80% in our study, if defined as completing the whole eight sessions, is in line with

treatments that offer no support (Richards & Richardson, 2012). However, the equally high dropout in the therapist-delivered condition (eCBT) in the current study is puzzling and contradicts the bulk of literature to date (Richards & Richardson, 2012). For the current sample we could only speculate as to the reasons for dropout. However, a study of significant events and their impact in the current sample revealed that the burden of work, issues with time and pace, technical issues, some of the content and its form of delivery were reported as hindering for users and consequently may have influenced dropout (Richards & Timulak, 2012). Listening to what users are saying about their experience of online interventions can only aid in improving such interventions and extend access.

Despite not completing all eight sessions, participants improved; this is similar in other online studies (Meyer et al., 2009; Warmerdam, van Straten, Twisk, Riper, & Cuijpers, 2008). Perhaps participants improved with the passage of time alone, or perhaps participants improved early in treatment and decided to withdraw (Howard, Kopta, Krause, Merton, & Orlinsky, 1986). Successful online interventions may be particularly useful for students unlikely to access formal services, for students with shame-based disorders, and for some who may have a preference for online rather than face-to-face (Richards & Viganó, 2012; Ryan et al., 2010).

The results of the working alliance measure indicate that a positive therapeutic bond could be established online and one that is significantly stronger in the therapist-delivered condition. Although we cannot conclude from the current study that there is any reason to add a therapist-supported element, it seems reasonable to hypothesise that relational aspects may have been a potential factor in the eCBT treatment's success. In line with

similar findings from Andersson et al.'s (2012) study of alliance scores in online treatments, it is an area for further investigation as to whether the influential therapist factors in online treatments are the same and operate similarly as they do in face-to-face treatments. On the other hand, relational features did not correlate as strongly with outcome in the cCBT condition. Perhaps it suggests two routes to successful outcome, one (cCBT) solely through non-relational CBT techniques and strategies and one (eCBT) that also benefited from a relational element.

### Limitations

The main limitation is the low statistical power that did not allow us to assess whether the trend in the effect size outcomes favouring eCBT over cCBT is beyond a random variation. The same applies to correlations between the perceptions of working alliance and the overall outcome, where quite substantial correlations in the eCBT condition were not statistically significant.

Research attrition was high, 50–60% at different times when the data were collected. It is possible that participants that benefited from the interventions were overrepresented in the collected data. Yet, there was no differential research attrition between the two conditions, so any between-groups differences (or their absence) should not have been impacted by the research attrition.

The current study did not control for participants accessing other treatments during treatment or follow-up. However, Ruwaard et al. (2009) in a study of cCBT noted that persistent improvements were not explained by any additional treatments participants sought.

Dropout was very high in the current study. We did not include in the design a follow-up questionnaire for those who initially dropped out pre-treatment and those who dropped out during treatment asking about the reasons for the drop-out. This may have yielded significant information that could explain such a high dropout.

Other limitations are that we relied on self-report data rather than an official diagnosis. Also the extent to which our findings with a student sample can be generalised to a broader population, or indeed a more severely affected group, remains open to further study. Lastly, the interventions themselves may be problematic, perhaps there was a lack of functionality, multimedia, interactivity, that might engage any user and support adherence, and this

may be especially true of the eCBT participants who received the intervention completely in text format.

### Conclusion

The study has demonstrated that within a University context a cCBT treatment for depression can be delivered successfully in different modes, self-administered and therapist-delivered. At post-treatment and follow-up clinical improvement and recovery was demonstrated for both groups equally. It seems that a therapeutic alliance can be developed online, and while there is insufficient evidence to support its impact on outcomes, a therapist-delivered treatment may play a role in outcome, and such data is worth further investigation. The possibility for cCBT and its cost-effectiveness as a self-administered treatment in a University mental health setting has important clinical benefits and may contribute to addressing the shortcomings in meeting increasing demands that services presently face.

### Acknowledgements

Thanks to ESB Electric Aid, the Health Service Executive Innovation Fund and the National Office for Suicide Prevention for funding this study. Thanks to the many staff members of the Counselling Service at Trinity College whom made contributions to this study, and a special thanks to Betty Gleeson and Orla McLoughlin. Thanks also to Joanna Harney and Kevin Murphy for their work on the adherence measure. Thanks to all the participants who obliged themselves to participate in the study.

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