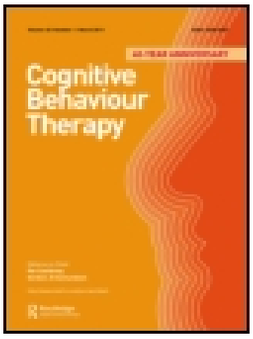

Cognitive Behaviour Therapy

ISSN: 1650-6073 (Print) 1651-2316 (Online) Journal homepage: http://www.tandfonline.com/loi/sbeh20

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To cite this article: Kristofer Vernmark, Hugo Hesser, Naira Topooco, Thomas Berger, Heleen Riper, Liisa Luuk, Lisa Backlund, Per Carlbring & Gerhard AnderssonOn behalf of the E-COMPARED consortium (2018): Working alliance as a predictor of change in depression during blended cognitive behaviour therapy, Cognitive Behaviour Therapy, DOI: 10.1080/16506073.2018.1533577

To link to this article: https://doi.org/10.1080/16506073.2018.1533577

COGNITIVE BEHAVIOUR THERAPY
https://doi.org/10.1080/16506073.2018.1533577

Working alliance as a predictor of change in depression during blended cognitive behaviour therapy

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ABSTRACT

Blended Cognitive Behaviour Therapy (bCBT) is a new form of treatment, mixing internet-based modules and face-to-face therapist sessions. How participants rate the therapeutic alliance in bCBT has not yet been thoroughly explored, and neither is it clear whether therapist- and patient-rated alliances are predictors of change in depression during treatment. Depression and alliance ratings from 73 participants in a treatment study on bCBT (part of the E-COMPARED project) were analysed using growth curve models. Alliance, as rated by both patients and therapists, was high. The therapist-rated working alliance was predictive of subsequent changes in depression scores during treatment, whereas the patient-rated alliance was not. A therapeutic alliance can be established in bCBT. The role of the therapist-rated alliance seems to be of particular importance and should be carefully considered when collecting data in future studies on bCBT.

ARTICLE HISTORY
Received 5 January 2018
Accepted 19 September 2018

KEYWORDS
Therapeutic alliance; depression; blended treatment; internet-based treatment; growth models

Introduction

Depression is a common mental disorder that has extensive disabling effects in the population, as confirmed both from the Swedish (Johansson, Carlbring, Heedman, Paxling, & Andersson, 2013) and the international perspective (Alonso, Lépine & ESEMeD/MHEDEA 2000 Scientific Committee, 2007; Murray et al., 2012). There are several effective treatments for depression (Barth et al., 2013; Cuijpers, 2015), but there is a lack of therapists and access to effective treatment in the healthcare sector. This has led to increased interest in treatment methods that can reach more people without loss of quality in the intervention (Emmelkamp et al., 2014).

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Clinical trials registration number NCT02449447

Internet-based and blended treatments for depression

Internet-based treatment for depression has been widely studied and several formats have been researched, including cognitive behavioural-, (Andersson et al., 2005) psychodynamic- (Johansson et al., 2013a) and interpersonal psychotherapy (Donker et al., 2013). The method most commonly used has been *Internet-based cognitive behaviour therapy* (ICBT), which has been proven effective for depression (Andersson, Nordgren, Buhrman, & Carlbring, 2014; Richards & Richardson, 2012). Studies that have included therapist support have shown greater effect than those without support (Johansson & Andersson, 2012). Although most studies on internet-based treatment have evaluated online self-help in combination with text-based support from a therapist (Carlbring et al., 2013; Vernmark et al., 2010), another way of delivering treatment is by combining therapist face-to-face sessions with internet-based material—so-called *blended treatment* (Erbe, Eichert, Riper, & Ebert, 2017). Erbe and colleagues propose two versions of blended treatment, based on how face-to-face and online material is combined and delivered. An *integrated blended intervention* is where face-to-face and online material is used in conjunction with each other, in an integrated delivery within the same time period. A *sequential blended intervention* is when the internet-based material is delivered before or after a face-to-face intervention, as in stepped care or relapse prevention. Using CBT in integrated blended interventions is defined as *blended cognitive behaviour therapy* (bCBT; Kooistra et al., 2016). The use of bCBT might provide specific advantages such as decreasing the costs of treatment while making it possible to adapt and individualize internet-based treatments (Mathiasen, Andersen, Riper, Kleiboer, & Roessler, 2016). Blending digital material with traditional face-to-face sessions might also increase acceptance of interventions that make use of internet-based self-help material. Surveys have shown positive attitudes towards blended interventions among stakeholders in the healthcare sector, which could facilitate implementation of these types of interventions in regular care settings (Topooco et al., 2017). To date, little is known about the effects of bCBT, but the results so far seem promising (Høifødt et al., 2013). Two studies comparing bCBT with face-to-face CBT in the treatment for depression showed that these delivery methods were equally effective and that treatment groups did not differ on the main outcome measures (Ly et al., 2015; Thase et al., 2017).

Working alliance

The role of the therapeutic alliance has been an area of interest in psychological treatment for many years, and several meta-analyses report a robust, albeit modest, association between the quality of the therapeutic alliance and treatment outcomes across a broad spectrum of psychological treatments and client/problem contexts (Horvath, Del Re, Flückiger, & Symonds, 2011). The therapeutic relationship and alliance have been conceptualized and measured in many ways, but one of the most widely used is the pantheoretical concept of the *Working Alliance* (Bordin, 1979). The working alliance is usually understood as one general factor with three different alliance components, which relate to the degree of mutual trust and acceptance (*the Bond*), the agreement on the specific tasks in treatment (*the Task*), and the agreement on the therapeutic goals (*the Goal*).

Patient-rated alliance measures are most commonly used in research studies, but alliance can also be measured by therapists or observers (Horvath et al., 2011). Meta-analyses show that there are high correlations between type of rater and no differences in the ability to predict outcome with regard to who is rating the alliance (Martin, Garske, & Katherine Davis, 2000). Although being the least used in outcome studies, therapist-rated alliance might be a useful tool in clinical settings as therapist themselves could perform ratings of their interactions with patients and from the results predict the potential outcome of the therapeutic intervention.

Research thus far has shown that the level of working alliance as rated by the patient is similar in internet-based treatment and traditional therapy (Cook & Doyle, 2002; Preschl, Maercker, & Wagner, 2011), although the results regarding the role of the patient-rated alliance as a predictor of outcomes in ICBT lack clarity. Some studies have shown that patient-rated alliance can be a predictor of outcomes (Bergman Nordgren, Carlbring, Linna, & Andersson, 2013; Wagner, Brand, Schulz, & Knaevelsrud, 2012), while other studies suggest that there is no association between this alliance and outcomes (Andersson et al., 2012; Hadjistavropoulos, Pugh, Hesser, & Andersson, 2016). While there are several published studies on the patient-rated working alliance, there are only a few studies that assess the therapist-rated alliance (Knaevelsrud & Maercker, 2007; Preschl et al., 2011). In a recent review on alliance in internet-based treatment modalities, the author concludes that even though there is preliminary evidence that alliance ratings are equivalent to what is usually seen in face-to-face treatment, there is a need for more studies on the role of alliance in internet-based treatment and specifically the role of therapist-rated alliance (Berger, 2017).

In one of the few studies comparing working alliance in blended treatment for depression, with face-to-face treatment, no significant differences in patient-rated alliance were found between groups (Ly et al., 2015). When analysing alliance as a moderator of outcome, patient-rated alliance predicted outcome in the blended treatment condition. Since patient- and therapist-rated alliance have been shown to predict outcome in face-to-face therapy, but have contradicting results in ICBT, it might be that increasing the amount of therapist contact in internet-based interventions could increase the role of therapeutic alliance with regard to outcome.

The first aim of this study was to explore the patient- and therapist-rated alliance in bCBT. Our second aim was to further examine the working alliance as a predictor for change in depression during blended treatment.

Methods

Background

The data in this study were collected in Sweden between spring 2015 and fall 2016 in a two-arm non-inferiority randomized controlled trial comparing bCBT with treatment as usual (TAU), clinical trials registration number NCT02449447. The study was part of a large European project (the E-COMPARED project), which is described in more detail elsewhere (Kleiboer et al., 2016).

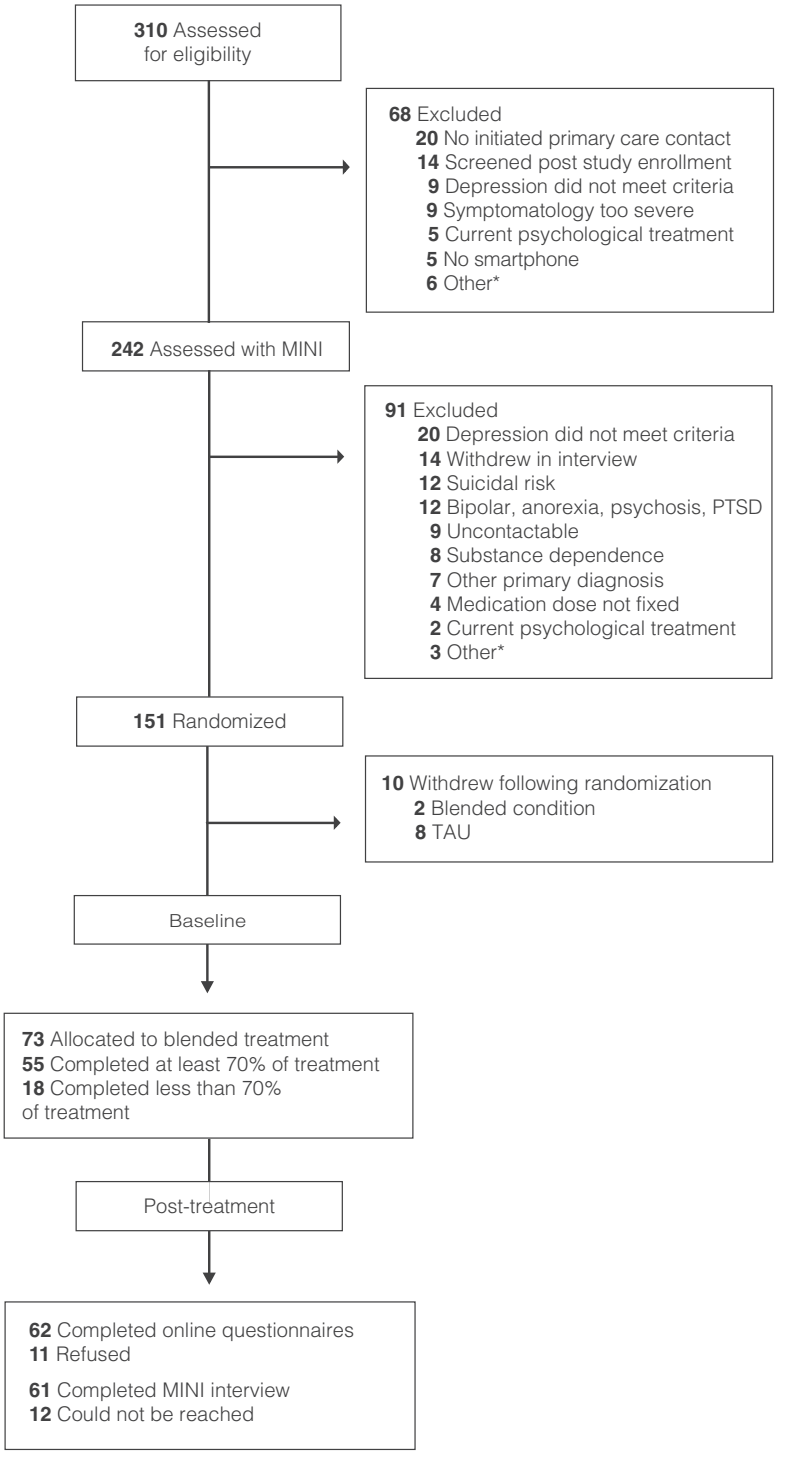
Participants

Patients were recruited from participating mental healthcare centres in three Swedish cities. Participants received information about the trial at the healthcare centres, and clinicians were instructed to recommend participants with depressive symptoms to find more information and sign up for the study through the study website. A total of 306 individuals signed up for the study. To be included in the study, the participant had to be 18 years or older, fulfil the criteria for *Major Depressive Disorder* according to DSM-IV criteria as confirmed by a *MINI International Neuropsychiatric Interview* (MINI; Sheehan et al., 1998) conducted by telephone, and have a score of five or above on the *Patient Health Questionnaire* (PHQ-9; Kroenke, Spitzer, & Williams, 2001). Exclusion criteria were risk of suicide, severe psychiatric comorbidity, being currently under other psychological treatment for depression, insufficient comprehension of the spoken and written Swedish language, and no access to a computer or smartphone with Internet connection. A total of 147 participants were included and 73 of these were randomly allocated to the bCBT (1:1 ratio). See Figure 1 for a flow chart showing registration, inclusion, randomization and dropout, and Table 1 for sample characteristics of the bCBT-group. In this paper, we report data from participants in the bCBT group only as alliance measures were not collected for the TAU-group. TAU involved self-referral to primary care settings and was defined as the care given to participants in those settings. This meant that they received treatment for their depression in the form of medication, psychotherapy, physical exercise or other options as provided by the regular care setting.

Blended cognitive behaviour therapy (bCBT)

Participants in the bCBT-group received four live sessions (at weeks 1, 3, 6 and 10) with a therapist, weekly online therapist feedback between sessions and 10 online modules during the treatment period. The treatment lasted for 10 weeks in total. Therapist sessions were 45 min long and conducted face-to-face. All internet modules were delivered through the Swedish *Iterapi* platform (Vlaescu, Alasjö, Miloff, Carlbring, & Andersson, 2016), and could be accessed through a computer, tablet or smartphone. The main content in modules was delivered by text and images, with the possibility to register answers to exercises and homework online. Therapists used the platform to supervise a participant's work with the modules, supplying new modules, reviewing homework, monitoring symptoms of depression and using secure asynchronous text-communication to communicate with the participant. Participants worked with one online module per week in a fixed order and received feedback online from therapists on a weekly basis (between face-to-face sessions). Therapists spent 65 min (SD = 15) per face-to-face session and 16 min (SD = 12) per week online writing feedback to participants and other various tasks specified above.

The core content of the bCBT was specified by the E-COMPARED consortium and included psychoeducation, behavioural activation, cognitive restructuring and relapse prevention (Kleiboer et al., 2016). In addition to the core content, modules also contained information and exercises regarding avoidance behaviours, functional analysis, goals and values.



*Other included being abroad, from other county, being <18 years of age, no internet, non-fluent in Swedish

Figure 1. Flow chart for blended treatment group.

Table 1. Sample characteristics for the blended cognitive behaviour therapy (bCBT).

Characteristics	bCBT-group
Age, M (SD) (in years)	34.7 (13.9)
Gender (female)	54 (74%)
Marital status	
Single	28 (38.4%)
Divorced	3 (4.1%)
Widowed	0 (0%)
Married/cohabiting	42 (57.5%)
Highest Educational level	
Elementary school	1 (1.4%)
High school	15 (20.5%)
University	57 (78.1%)
Employment status	
Full-time work	25 (34.2%)
Student	38 (52.1%)
Unemployed	4 (5.5%)
Parental leave	0 (0%)
Sick leave	3 (4.1%)
Retired	3 (4.1%)
Comorbidity (any diagnosis)	45 (61.6%)

N = 73.

Therapists

Therapists (n = 12) were last year clinical psychology students (5-year programme), with the exception of one therapist who was a newly examined psychologist working her first year as an intern psychologist. All therapists had completed their clinical training, including supervised clinical practice in CBT with at least three clients. The total amount of training was one and a half years (not full-time). Moreover, therapists had completed a supervised internship for 14 weeks. All therapists received supervision from a licensed psychotherapist and supervisor during the study. Therapists also received training on how to deliver blended treatment both online and in the face-to-face setting. To ensure treatment fidelity, a treatment manual was provided. The treatment manual was developed for this study and specified what content was to be provided at the live sessions and in which order. Session contents were as follows: Introduction to CBT (Session 1), Behavioural activation (Session 2), Cognitive restructuring (Session 3) and Relapse prevention (Session 4). The manual also included instructions on how to provide feedback online and interact with the content provided by participant in homework assignments. Therapists were instructed to provide positive reinforcement, validate participants' experiences, answer questions, motivate and interact with patients in ways that have been proven effective in other studies on internet-based treatment (Holländare et al., 2016; Paxling et al., 2013). Therapists received regular supervision and also registered the number of sessions, the frequency of sessions, the length of each face-to-face contact and the time spent with the online platform between sessions.

Outcome measures

Patient-rated alliance was measured with a translated online version of the *Working Alliance Inventory–Short Revised–Client version* (WAI-SR-C), a 12-item self-report questionnaire with a 5-point Likert-type scale ranging from "Seldom" to "Always"

(Hatcher & Gillaspy, 2006). A composite score is calculated by adding the scores from the individual items and dividing this by 12, ending up with a total score ranging from 1 to 5 (higher equals better). Subscale scores for Bond, Task and Goal are also calculated. Each of these subscales consists of four items. The Working Alliance Inventory–Short Revised version is a widely used measure that has good psychometric properties (Munder, Wilmers, Leonhart, Linster, & Barth, 2010) and the ability to predict symptom changes during treatment (Falkenström, Granström, & Holmqvist, 2014). WAI-SR-C was measured online at week 4 of the treatment. This was after participants had received two sessions with a therapist and had worked with three online modules. Cronbach's alpha for WAI-SR-C in the present study was α = .81 for the Goal subscale, α = .84 for the Task subscale, α = .80 for the Bond subscale and α = .90 for the composite score.

Therapist-rated alliance was measured using a translated online version of *Working Alliance Inventory—Short Revised—Therapist version* (WAI-SR-T; Munder, 2007), a 10-item self-report questionnaire using a 5-point Likert-type scale ranging from "Seldom" to "Always". A composite score is calculated by adding the scores from all items and dividing by the number of questions, ending up with a total score ranging from 1 to 5 (higher equals better). Subscales for Bond, Task and Goal are calculated. Task and Goal each consist of three items and Bond of four items. The WAI-SR-T was measured online at week 4 at the same time as the WAI-SR-C. This was after the therapist had met with the participants for two sessions and the participant had worked with three online modules. Cronbach's alpha for WAI-SR-T was α = .87 for the Goal subscale, α = .88 for the Task subscale, α = .78 for the Bond subscale and α = .91 for the composite score.

The PHQ-9 was used as the primary outcome measure (Kroenke et al., 2001). The PHQ-9 is a 9-item questionnaire that measures depression (Gilbody, Richards, Brealey, & Hewitt, 2007). Each item is scored from 0 to 3, with a total sum of 0–27 for all nine items. Higher scores indicate more severe depression. The PHQ-9 is a widely used instrument with good internal consistency, test-retest reliability and external validity (Blackwell & McDermott, 2014), and with similar properties in the online versions of the questionnaire (Titov et al., 2011). PHQ-9 was measured online before and after treatment and also weekly during the 10 weeks of treatment.

Statistical analysis

Growth models using multilevel modelling in SPSS (version 23.0) were used to analyse the continuous outcome data. Growth modelling can be used as a way of modelling individual change rate over time by incorporating random effects, and it is therefore useful when examining predictors of individual change (Hesser, 2015). All models made use of all available data, without imputation, in the estimation of parameters (and standard errors) and retained individuals with at least one valid observation on the dependent variable in the model. Parameters were estimated using a restricted maximum likelihood analysis and missing data were handled under the less restrictive assumption of missing at random (MAR). The assumption of MAR sees missing data as a function of measured characteristics (other observed data), but

not a direct function of the data that is missing, i.e. the would-be value. The best-fitted model was determined analytically by comparing nested models.

Our main interest was to examine working alliance as a predictor of subsequent changes in depression scores. Therefore, WAI-SR-C and WAI-SR-T, both measured at week 4, served as predictors in two separate growth models. Weekly measurements on PHQ-9, collected between week 4 and post-assessment, were used as the dependent variable in the growth models. To control for symptom reduction that had occurred prior to the measurement of the working alliance, PHQ-9 measured at week 3 was also added to the analysis as a predictor. To test the main hypothesis of the study, we examined whether the WAI scores rated at week 4 were predictors of growth rates on the PHQ-9 (i.e. time by predictor interaction term in the model). To control for therapist differences in outcome, a univariate ANOVA with therapist as factor and PHQ-9 at post-assessment as dependent variable was calculated. To obtain a within-group standardized effect size (*d*), the beta coefficient (i.e. the beta-coefficient, expressed as change per time unit) was multiplied by the time score for the last time point, and then divided by the pooled standard deviation of observed values at baseline.

Results

Depression scores and alliance ratings

Means and standard deviations for PHQ-9 from pre- to post-assessment, WAI-SR-C and WAI-SR-T are shown in Tables 2 and 3. There were large and statistically significant intercorrelations between subscales and total score, ranging from $r = .83$ to $r = .87$ for WAI-SR-C and from $r = .76$ to $r = .94$ for WAI-SR-T. No significant differences in PHQ-9 at post-assessment with regard to therapist were found $F(1,11) = 1.268$, $p = .270$.

Table 2. Means and standard deviations for PHQ-9 from pre- to post-assessment.

	M	SD	*N*
Pre-measurement	14.29	5.11	73
Week 1	11.11	6.65	72
Week 2	10.70	5.45	71
Week 3	9.58	4.89	69
Week 4	9.30	5.29	67
Week 5	8.72	5.54	65
Week 6	8.62	5.94	63
Week 7	8.74	5.96	62
Week 8	8.16	6.14	61
Week 9	8.02	5.66	59
Week 10	7.63	5.98	57
Post-measurement	8.63	5.77	62

Table 3. Mean, standard deviation and range of alliance measures *at week 4.*

	WAI-SR-C			WAI-SR-T		
	M	SD	Range	M	SD	Range
Total	3.86	0.60	1.67–4.75	3.93	0.66	2.10–5.00
Goal	4.04	0.70	1.50–5.00	3.57	0.93	1.33–5.00
Task	3.45	0.72	1.00–4.75	3.72	0.82	1.67–5.00
Bond	4.10	0.69	2.50–5.00	4.36	0.56	2.75–5.00

WAI-SR-C = Working Alliance Inventory–Short Revised–Client version ($N = 61$) and WAI-SR-T = Working Alliance Inventory–Short Revised–Therapist version ($N = 66$).

Changes in depression scores (unconditional model)

First, we fitted an unconditional model (i.e. a model with time as the only predictor) to examine average change and heterogeneity in change in depression scores from week four to post-assessment. A linear model with correlated random effects and correlated error terms (i.e. an autoregressive structure) was fitted using the PHQ-9 weekly measurements as the dependent variable. Scores on PHQ-9 decreased on average by 0.11 points per week, 95% CI [−0.27, −0.05] from week 4 to post-measurement. There was significant heterogeneity in depression ratings at week 4 ($p < .01$) and individual change rate ($p < .05$), but no significant covariation was found between ratings at week 4 and individual change rate ($p = .65$).

Patient-rated WAI as a predictor of change in depression

To examine if patient-rated working alliance could predict change rate in depression, WAI-SR-C week 4 and PHQ-9 week 3 were added as time-invariant predictors in a conditional growth model. No significant effect for WAI-SR-C on change rate for depression was found ($p = .90$), which suggests that a patient-rated alliance does not predict change in depression during the specified treatment period. In line with these non-significant effects of WAI, there was still significant heterogeneity in depression ratings at week 4 ($p < .01$) and in individual change rates ($p < .05$).

Therapist-rated WAI as a predictor of change in depression

To examine if a therapist-rated working alliance could predict rate of change in depression, WAI-SR-T week 4 and PHQ-9 week 3 were added as time-invariant predictors in a conditional growth model. The model showed a significant effect of WAI-SR-T on change rate for depression, −0.50, 95% CI [−0.74, −0.26], indicating that a one point increase in WAI-SR-T (a higher alliance) was associated with a 0.50 decrease in PHQ-9 (less depression) per week. There was significant heterogeneity at week 4 ($p < .05$), but not in the slopes ($p = .23$) when WAI-SR-T and PHQ-9 week 4 had been accounted for. The effect of time expressed as a standardized effect was $d = 0.66$.

Discussion

The aim of this study was to explore ratings of therapeutic alliance in bCBT and to see if these were predictors of change in depression during treatment. The main findings were that the therapist-rated alliance predicted changes in depression and that alliance ratings for both versions of WAI-SR were high on all subscales. The high alliance ratings for bCBT are in line with earlier research on clinician-guided ICBT (Andersson et al., 2012), and they also correspond to alliance ratings in studies with face-to-face therapies using the same alliance measure (Munder et al., 2010). Level of depression at the time-point of alliance measures did not affect the predictive ability of WAI and no

significant differences between therapists were found regarding patient-rated depression at post-measurement.

Working alliance can be rated by patients, therapists or by independent observers. This study showed that the therapist-rated alliance, and not the patient-rated, correlated with a decrease in depression during treatment. To the best of our knowledge, this is a new finding that has not been observed previously, neither with face-to-face nor internet-based treatments. Although the finding needs to be replicated and confirmed in other studies, the importance of the therapist-rated alliance in the prediction of change during treatment could specifically apply to the blended treatment format. For instance, it may be that therapists are better than patients at judging whether the combination of face-to-face and online treatment fits the problems of the patient, their goals and capacities, thereby making the therapist-rated alliance better predictive of outcomes than the patient-rated alliance. It could also be argued that therapist-rated alliance is a better measure of the actual alliance between therapist and patient in blended treatment. Participants in this study rated their alliance in relation to the whole treatment, which also included self-help material online, whereas therapist rated their alliance based on the interaction with participants during treatment. Since it has been shown that self-help material also can include alliance bolstering components (Richardson, Richards, & Barkham, 2010), it is more difficult to entangle the role of patient-rated alliance in relation to the internet-therapist. Most ICBT-studies so far have used alliance questionnaires developed for the purpose of measuring alliance in face-to-face therapies. This has led some researchers to suggest that there is a need for developing new questionnaires to measure the specific aspects of interacting with online content during treatment (Berger, Boettcher, & Caspar, 2014). Thus, a future question in blended treatment is whether the available questionnaires are suitable for measuring alliance with this specific method, or if new questionnaires need to be developed to fully understand the role of alliance and its place in blended treatment.

A thorough comparison with other studies on patient- and therapist-rated alliance in blended therapy would have been interesting, but to our knowledge there is a lack of similar studies to compare with. In the aforementioned study by Ly et al. (2015), patient-rated alliance was used, and these ratings were significantly correlated with outcome, which was not the case in this study. Unfortunately, no therapist-rated alliance measurements were used in the study by Ly and colleagues.

Some limitations apply to this study. An a priori choice was made to use WAI-SR total score as the main predictor and to control for depression scores the week before alliance ratings by using PHQ-9 measured at week 3. WAI-SR have been proposed as measuring three separate subscales or as using a two-factor model (Falkenström, Hatcher, & Holmqvist, 2015), but the total score is the most common way of measuring working alliance. In this study, intercorrelations between WAI-subscales and total score were high.

Alliance can be measured at different time points and with different questionnaires. In common with most research on the role of alliance we did not experimentally manipulate the level of alliance and thus the reported association is by nature correlational, even if alliance was measured before the outcome. We did not measure expected alliance before seeing the clinician as have been done in other studies (Bergman Nordgren et al., 2013). Moreover, we did not use session or weekly measurements of

alliance during the treatment period (Falkenström, Ekeblad, & Holmqvist, 2016) since this was not part of the E-COMPARED study design. Because of the large change in patient-rated symptoms of depression during the first weeks of treatment, it would have been interesting and possibly better to have measured alliance earlier in the treatment. In addition, the early change left less room for further improvement and thus reduced the ability of the WAI to predict change, although individual variability can still be large and there was significant heterogeneity in individual change rates for depression between week 4 and post-measurement. Also, since research has shown that patient-rated alliance seems to be more stable over time than therapist-rated alliance (Martin et al., 2000), it would have been interesting to have measured alliance more frequently during the treatment period and compared results from the different raters.

Participants in this study were highly educated, which might have affected the results. Previous research on internet-based treatments has shown that a higher educational level can be a predictor of positive outcomes (Warmerdam, van Straten, Twisk, & Cuijpers, 2013) and that a lower educational level can predict lower symptom improvement (Hadjistavropoulos, Pugh, Hesser, & Andersson, 2016a).

Studies have shown that therapist variability account for up to 7% of outcome variance (Firth, Barkham, Kellett, & Saxon, 2015). However, we found no significant differences in therapist effects on outcome when performing an ANOVA with therapist as a factor. Even though this is a common finding in studies on internet-based treatment, with a larger sample size a more thorough investigation and analysis on the role of therapist effects would have been preferable, both regarding outcome and alliance.

Blended treatment is a new form of treatment that is still under development (van der Vaart et al., 2014). More research is needed regarding how best to deliver this treatment and the influence of the working alliance between therapist and patient. This study shows that there is a need for more studies that include not only the patient-rated alliance but also look more closely at the therapist-rated alliance when predicting change during treatment. It also addresses the need to develop and use questionnaires that are adapted to the inclusion of online self-help material in the treatment of depression.

In conclusion, the study contributes to the knowledge base regarding the alliance in blended treatment and the respective roles of the patient- and therapist-rated alliance. Findings suggest that alliance ratings in blended treatment are similar to those in face-to-face therapies and in internet-based treatments. In addition, the therapist-rated alliance is important in predicting change in depression during blended treatment. The role of the therapist and therapeutic alliance in methods using delivering a large part of treatment through online self-help material is also a question for research up ahead, as there are studies showing that patients can experience positive alliance even in unguided internet-based programmes (Clarke et al., 2016). More research is needed on alliance in blended treatment for these results to be compared and more understood in greater depth.

Acknowledgments

We thank the webmaster George Vlaescu for his support.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

This project is funded by the European Commission FP7-Health-2013- Innovation-1 program, grant agreement number: 603098. We thank the E-COMPARED consortium for financial support.

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