

The working alliance in blended versus face-to-face cognitive therapy for depression: A secondary analysis of a randomized controlled trial

Samuel Askjer^a, Kim Mathiasen^{b,c,*}

^a Department of Psychology, University of Aarhus, Aarhus, Denmark

^b Department of Affective Disorders, Aarhus University Hospital - Psychiatry, Aarhus, Denmark

^c Research Unit for Telepsychiatry and e-Mental Health, Department of Clinical Research, University of Southern Denmark, Odense, Denmark

ARTICLE INFO

Keywords:

Working alliance
Blended cognitive behavioural therapy
Depression

ABSTRACT

Introduction: We explored the working alliance as measured by both clients and therapists. The working alliance has been known to predict the outcome of psychotherapy and is often considered an important common factor. This study raised the question of how to conceptualize the working alliance in the blended format.

Methods: This was an exploratory study derived from a randomized controlled trial comparing bCBT and face-to-face cognitive behavioural therapy (ftf CBT) on depression. The change in depressive symptoms was measured with the Patient Health Questionnaire (PHQ-9) and the working alliance was measured using the Working Alliance Inventory.

Analyses: Correlation coefficients were calculated for the working alliance as reported by clients and therapists, working alliance was then examined at item and dimension level (task, bond, goal). Linear regression models were applied to investigate the predictive value of the working alliance on treatment outcome. Interaction between the level of working alliance and treatment condition was also considered.

Results: Client and therapist working alliance ratings correlated at $r = 0.44$ and clients rated the working alliance higher than therapists ($\bar{x}_{clients} = 48.6$, $\bar{x}_{therapists} = 44.6$). ftf CBT and bCBT had comparable joint working alliance ratings ($\bar{x}_{ftf} = 46.4$, $\bar{x}_{bCBT} = 46.8$). Items had little deviation apart from item 4 with high positive values. The level of working alliance from the total sample did not significantly predict outcome based on the client's perspective. Contrarily, seen from the therapist's perspective, it did ($b = 0.00$, $p = .044$). Using the mean from these predictors as a composite variable, was also significant ($b = 0.00$, $p = .039$, $R^2_{adj} = 0.07$). There was no significant interaction with treatment condition.

Discussion: Clients and therapists may lay emphasis on different aspects of the working alliance. The finding that therapist-rated working alliance was better than client working alliance at predicting outcome went against common findings; this pattern may be specific to bCBT.

Conclusion: Clients rated the working alliance slightly higher than therapists on average. Clients and therapists as well as treatment conditions had different profiles on dimension deviations. Therapist ratings of the working alliance appeared to better predict treatment outcome than client ratings. Joint working alliance predicted outcome using client and therapist composite means. The working alliance was equally strong in ftf CBT and bCBT. The absence of interaction with treatment condition indicated that the working alliance was equally predictive of outcome in ftf CBT as in bCBT.

1. Introduction

Depression is a mood disorder with both mental and somatic manifestations. The main symptoms are low mood, anhedonia, insomnia, fatigue, loss of appetite and suicidal ideation (World Health Organization, 2019). Global Burden of Disease Study (2017) considered

depression the third largest contributor to years lived with disability (YLD). A recent surge of meta-analyses comparing internet-based cognitive behavioural therapy (iCBT) with waiting-list and treatment as usual, have demonstrated the efficacy and effectiveness of this treatment approach for various disorders (Carlbring et al., 2018; Andrews et al., 2018; Karyotaki et al., 2017; Zhou et al., 2016).

* Corresponding author at: Department of Psychology, Faculty of Health Sciences, University of Southern Denmark, Campusvej 55, 5230 Odense M, Denmark.
E-mail address: kmathiasen@health.sdu.dk (K. Mathiasen).

<https://doi.org/10.1016/j.invent.2021.100404>

Received 21 August 2020; Received in revised form 6 May 2021; Accepted 18 May 2021

Available online 24 May 2021

2214-7829/© 2021 The Authors. Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license

(<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Combining iCBT and ftf CBT in an effort to get the best of both worlds is often labelled blended CBT (bCBT).¹ In bCBT, elements of iCBT and ftf CBT are incorporated in a session plan where online modules supplement traditional sessions, often in an alternating sequence. bCBT frees up professional resources by being scalable, flexible in time and accessible over distance. This format could potentially be more affordable for healthcare providers compared to ftf CBT, because it can lower the necessary amount of therapist hours whilst retaining similar efficacy (Wright et al., 2005). There are indications that bCBT can be cost-effective at the socioeconomic level (Kooistra et al., 2019).

As of yet, little is known about the impact on the therapeutic alliance, when introducing technological elements into psychotherapy. Richard Sterba provided a model built on the notion of non-transferential parts of psychoanalysis in 1934, giving rise to the eventual idea of the working alliance (also called therapeutic alliance or helping alliance) (Horvath, 2018; Friedman and Samberg, 1994). He emphasized the patient's ability to perform ego-split and self-inquiry through mutual cooperation with the therapist. In tandem with their therapist, the patient could explore and dissociate parts of the ego in a healthy way. This could happen both at the conscious and unconscious level, through the patient's ego introspection and the therapist's analysis of the ego (Friedman and Samberg, 1994). Elisabeth Zetzel first used the word 'alliance' in 1956 to describe aspects of patient-therapist collaboration. Ralph Greenson later defined the core of the working alliance as: "(...) formed by the patient's motivation to overcome his illness, his conscious and rational willingness to cooperate, and his ability to follow the instructions and insights of his analyst" (Greenson, 2008, p. 80). Psychoanalytic thinkers of the day viewed the relationship between helper and beneficiary as an essential ingredient in psychotherapy (Horvath, 2018).

Bordin (1979) claimed, in a seminal paper, that the working alliance could be understood as the therapeutic interaction or real relationship that generalized across specific techniques and theoretical orientations. Hence contributing to the expansion of this construct beyond psychoanalysis. The working alliance was conceptualized to encompass elements of the tasks hand, the bond between partakers and the set goals in psychotherapy (Bordin, 1979). The task dimension includes the professional contract regarding how the patient and the therapist cooperate on particular techniques used during psychotherapy, the parties involved can vary in their inclination to be either sceptical or confident in the methods used. The bond dimension had to do with how well the parties connect as humans or had "good chemistry". Trust and respect as were considered relational properties that contribute to the bond in psychotherapy. The goal dimension involved the degree to which the parties agreed about the ultimate goal of psychotherapy. Ideally, both parties should have converging ideas on the desired outcome. Goals should be considered both in short-term milestones from session-to-session and enduring long-term changes (Bordin, 1979).

The quality of the working alliance is known to predict the outcome of psychotherapy in general and is considered an important common factor. This relationship seems to be robust, albeit moderate, irrespective of therapeutic orientation (Flückiger et al., 2018; Horvath & Symonds, 1991). Less research has been done on the working alliance in the context of bCBT, and how it relates to the working alliance in generic psychotherapy. Vernmark et al. (2019) found that therapist-rated alliance predicted depression outcome during the course of bCBT, whilst client-rated alliance did not. In an observational study, Mol et al. (2018) explored the content of written therapeutic feedback offered on a web-based platform in bCBT for depression. This platform was used after completed online modules and for practical communication purposes throughout the course of treatment. The most frequent categories used

were: informing, encouraging and affirming. On the contrary, self-disclosure, confrontation and emphasizing responsibility was uncommon. Confrontations were more apparent in ftf CBT and correlated with a positive outcome, which may be viewed through the lens of rupture-repair thinking (Mol et al., 2018; Gelso, 2014).

1.1. Aims

In the present study, we aimed to explore whether there were significant differences between the Working Alliance Inventory Client Version (WAI-C) and the Working Alliance Inventory Therapist Version (WAI-T) in terms of predicting treatment outcome. These inventories measured the working alliance from the viewpoint of the client and therapist, respectively. Furthermore, we aimed to investigate whether WAI-C and WAI-T predicted outcome (measured as participant random slopes on PHQ-9). Additionally, we aimed to explore whether working alliance interacted with treatment condition, i.e. predicted the outcome differently in the two treatment conditions. Finally, we wanted to inspect the relationship between WAI-C and WAI-T and whether certain WAI items deviated more than others from their respective means.

2. Methods

This exploratory study was a secondary analysis of data from a two-arm, non-inferiority, randomized controlled trial (RCT), comparing the effect of ftf CBT and bCBT on adults with major depressive disorder (MDD). The study protocol was registered at [ClinicalTrials.gov](https://clinicaltrials.gov) (NCT02796573). A brief description of the trial is included below, and a comprehensive description of the protocol has been published elsewhere (Mathiasen et al., 2016). Participants were recruited between March 1, 2016 and April 1, 2018 from Internetpsykiatrien in Odense, Denmark, which is an online clinic delivering iCBT for anxiety and depression (Mathiasen et al., 2018). Licensed clinicians and trained graduates referred willing participants to the study and diagnoses were confirmed using the Mini-International Neuropsychiatric Interview (MINI) according to Diagnostic and Statistical Manual of Mental disorders 4th edition (DSM-IV) (American Psychiatric Association, 2000). Eligible participants were then randomized by an independent researcher using Random Allocation Software with 1:1 symmetric allocation. Double-blinding during treatment was not possible insofar as treatment condition was evident to participants.

Inclusion criteria

- ≥18 years
- Meeting the diagnostic criteria for MDD and PHQ-9 ≥ 5
- Access to computer and internet

Exclusion criteria

- Current high risk of suicide
- Comorbid substance dependence, bipolar affective disorder, psychotic illness or obsessive-compulsive disorder
- Concurrently receiving psychological treatment for depression
- Unable to comprehend Danish
- Unable or unwilling to travel to physical location of the trial

During the intervention phase, the two treatment conditions were delivered in an effort to ensure equivalent treatment, apart from the difference in delivery format (bCBT being partially online). bCBT consisted of six face-to-face consultations alternated with six to eight online modules in the NoDep program by Context Consulting ApS. The ftf CBT condition comprised twelve face-to consultations. Progression of the consultations and online modules in the bCBT condition reflected the parallel ftf CBT sessions and were not simply used as repetition or condiments. Several steps were taken to ensure adherence to both therapies; participants received automated reminders to complete modules and to continue in the case of prolonged inactivity, personal contact from the guiding therapist and they were provided with the

¹ bCBT: Blended Cognitive Behavioural Therapy, iCBT: Internet-based Cognitive Behavioural Therapy, ftf CBT: Face-to-face Cognitive Behavioural Therapy, WAI: Working Alliance Inventory, WAI-C: Working Alliance Inventory Client Version, WAI-T: Working Alliance Inventory Therapist Version.

opportunity to perform the online modules at the clinic if requested.

Treatment conditions ran over a period of 12 weeks and the primary outcome variable was measured using the Patient Health Questionnaire (PHQ-9), which is a brief measure of depression severity with proven psychometric properties in the primary care setting (Kroenke et al., 2001). The PHQ-9 outcome variable was represented at baseline, 1 through 12 weeks of treatment and at 3, 6 and 12 month follow-up. Additionally, the Credibility and Expectancy Questionnaire (CEQ) was used to see how the participant's perceived the treatment they had been assigned and if this had an impact on working alliance and treatment relationship. CEQ measures the perception of cognitive credibility and emotional expectancy tied to receiving particular treatments. CEQ has good internal consistency within the factor structure and with a standardized Cronbachs α from 0.84 to 0.85 (Deville and Borkovec, 2000).

The Working Alliance Inventory – Short Revised (WAI-SR) (Hatcher and Gllaspy, 2006) was administered at 3-month follow-up as a measure for working alliance on both WAI-C and WAI-T. WAI-SR is a validated 12-item questionnaire built upon the construct put forward by Bordin (1979), and the central dimensions of the working alliance. Hatcher and Gllaspy (2006) ran confirmatory factor analysis to see whether the a priori dimensions matched with response patterns in the revised version. They found an adequate fit for the model (Tucker-Lewis index = 0.94), which exceeded that of the original version. WAI-SR is divided into 3 item dimensions meant to represent these distinct clusters of the working alliance: task (item: 1, 2, 8, 12), bond (item: 3, 5, 7, 9) and goal (item: 4, 6, 10, 11). This lends itself to a three-factor structure based on the three dimensions and a one-factor structure based on the overarching working alliance (Hatcher and Gllaspy, 2006). The WAISR has good internal consistency ($\alpha > 0.80$) and has convergent validity with the Helping Alliance questionnaire ($r > 0.64$) (Munder et al., 2010).

Written informed consent was obtained from all participants prior to randomization. The project was approved by the Ethics Committee of the Region of Southern Denmark and followed the ethical principles of the Declaration of Helsinki. Sensitive information was managed in accordance with the Danish Data Protection Agency and EU directive 95/46/EC. The present study was affiliated to the large-scale EU-project E-compared and part of the data set is shared with that study (Kleiboer et al., 2016). The present study, however, investigated the total local data set of the Danish trial, which ran for a longer period than the E-compared study.

3. Analyses

Three analyses were performed: (a) WAI-C and WAI-T correlations, (b) item and dimension deviations and (c) linear regression predicting participant random slopes on PHQ-9, in the linear mixed effect model from the RCT. Participant slopes were predicted on the basis of WAI-C and WAI-T as well as WAI-C and WAI-T means. This composite variable was used to predict participants' slopes from the client's and therapist's joint working alliance. Correlations were computed between WAI-C and WAI-T, along with effect size to gauge the magnitude. Correlations were also calculated for the ftf CBT and bCBT subsets of WAI-C and WAI-T for potential treatment condition differences in WAI-C and WAI-T association. Steiger's Z-test was performed to see whether an equivalent or higher correlation coefficient would be likely under the null hypothesis and range estimates were calculated using Zou's confidence intervals.

The next step involved calculating the deviations of item and dimension deviations of WAI-C and WAI-T from their appropriate means. WAI-C and WAI-T were analysed on an item-by-item basis where deviations and z-scores for all items were calculated. Combined deviations using both inventories were calculated to describe item deviation detached from client vs. therapist perspective. That is, each item deviation was calculated relative to the WAI-C and WAI-T combined mean (Fig. 1). The same statistics were also calculated relative to each

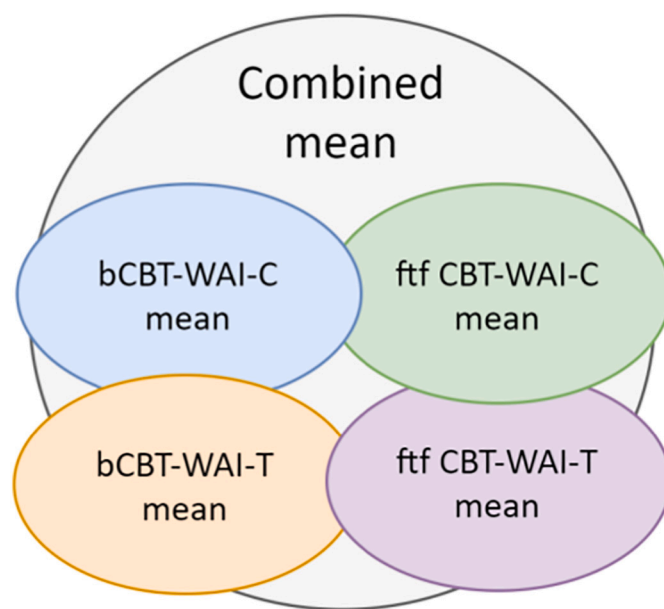


Fig. 1. Visualization of combined mean and all subset means.

subset mean to consider the amount of deviation, within directly comparable inventories and treatment conditions. That is, each item deviation was calculated relative to the mean for clients within bCBT (bCBT-WAI-C), therapists within bCBT (bCBT-WAI-T), for clients within ftf CBT (ftf CBT-WAI-C) and therapists within ftf CBT (ftf CBT-WAI-T) (Fig. 1).

In the last step, inferential analyses were conducted, where levels of the working alliance were used to predict outcome. In the LMM from the RCT, the natural main predictor for outcome was the time-effect of treatment and participants were used as random effects. In this analysis, outcome was defined as the individual participants' slopes on PHQ-9. Hence, the intention was to predict individual responses to therapy based on WAI-C, WAI-T and joint working alliance (WAI-C & WAI-T means). A multiple regression model was built where WAI-C and WAI-T were used as independent predictors. Variance inflation factor (VIF_i) was calculated on this model to check for multicollinearity in this model. Simple linear regression models were built for the total sample as well as within the ftf CBT and bCBT treatment condition, respectively. An interaction model was also built using the total sample with treatment condition as additional independent variables. All models were made in an unadjusted version and an adjusted version that included age, gender, marital status, education, employment status, treatment preference and CEQ as control variables. All tests were two-sided and used a significance level of 5%. The effect size was calculated using standardized mean differences (Cohen, 1992). All calculations were performed using Rstudio with R version 3.6.3, the mixed-effects models were performed using the lme4 package (Bates et al., 2015; R Core Team, 2020).

4. Results

In the RCT, 87 participants were assessed for eligibility using the inclusion and exclusion criteria described above, eleven subjects were excluded at this point. Thereafter, 38 participants were randomized to each arm of the RCT ($n = 76$) (Fig. 2). The sample had a majority of females (73.7%, $n = 56$) with a mean age of 35 years ranging from 18 to 71. The majority of the participants presented with moderate to severe levels of depression (Table 1).

WAI-C and WAI-T scores correlated at $r = 0.44$, indicating moderate agreement between client and therapist perception of the working alliance. This correlation was significant ($p = .001$) with a medium effect size ($d = 0.53$). Clients appeared to evaluate the working alliance as a

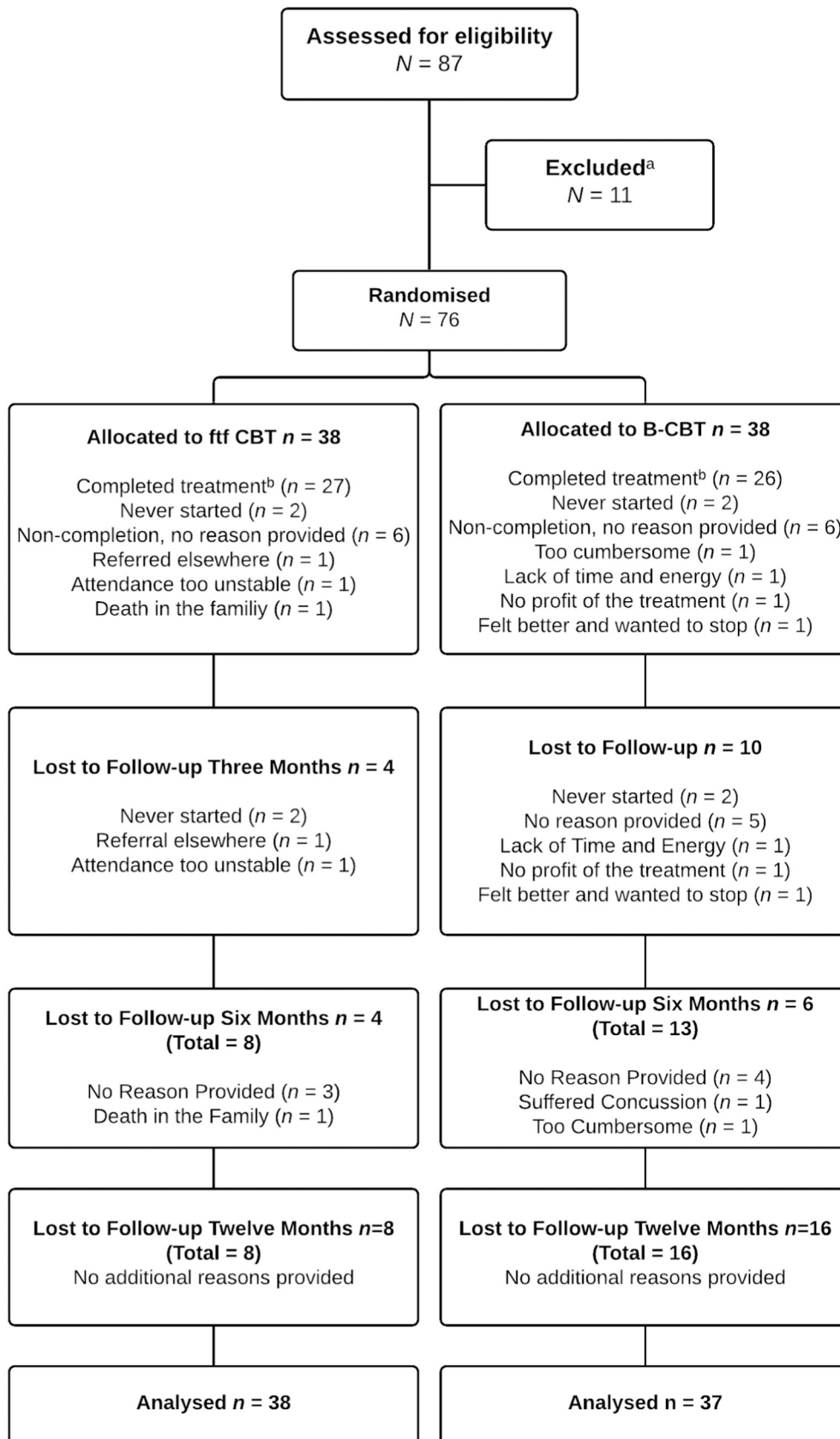


Fig. 2. Flowchart.

Table 1
Baseline characteristics.

	ftf CBT	bCBT	p
Baseline description			
n	38	38	
Age (mean(sd))	35.16 (14.14)	34.78 (13.98)	0.908
Gender = female (%)	29 (78.4)	27 (73.0)	0.786
PHQ (mean(sd))	16.05 (3.83)	14.42 (4.14)	0.084
Credibility (mean(sd))	0.67 (2.01)	-0.69 (2.28)	0.009**
Expectancy (mean(sd))	0.70 (2.22)	-0.72 (2.88)	0.022*
Marital status			
Marital (%)			NaN
Single	13 (35.1)	14 (37.8)	
Divorced	5 (13.5)	6 (16.2)	
Widow/widower	0 (0.0)	0 (0.0)	
Cohabiting	9 (24.3)	8 (21.6)	
Married	10 (27.0)	8 (21.6)	
No answer	0 (0.0)	1 (2.7)	
Highest education			
Education (%)			NaN
Further education <3 years	7 (18.9)	8 (21.6)	
Further education 3–4 years	13 (35.1)	13 (35.1)	
Higher education >4 years	4 (10.8)	3 (8.1)	
Fundamental school <8 years	0 (0.0)	0 (0.0)	
Fundamental school 9–10 years	3 (8.1)	3 (8.1)	
Gymnasium (3 years)	9 (24.3)	5 (13.5)	
Skilled worker	1 (2.7)	5 (13.5)	
Employment status			
Employment (%)			0.338
Full-time employed	9 (25.0)	4 (11.8)	
Part-time employed	5 (13.9)	9 (26.5)	
Sick leave	11 (30.6)	9 (26.5)	
Leave of absence	2 (5.6)	0 (0.0)	
Retired	1 (2.8)	1 (2.9)	
Unemployed	8 (22.2)	11 (32.4)	
Treatment preference			
Preference (%)			0.820
No preference	16 (43.2)	18 (50.0)	
Blended care	9 (24.3)	7 (19.4)	
Face-to-face	12 (32.4)	11 (30.6)	
Depression severity			
Severity (%)			NaN
No	0 (0.0)	0 (0.0)	
Mild	3 (8.1)	4 (11.1)	
Moderate	9 (24.3)	14 (38.9)	
Severe	19 (51.4)	16 (44.4)	
Highly severe	6 (16.2)	2 (5.6)	

*p < 0.05.

**p < 0.01.

little stronger ($\bar{x}_{clients} = 48.6$), compared to therapists ($\bar{x}_{therapists} = 44.6$) on a scale from minimum 12 to maximum 84. ftf CBT and bCBT had comparable working alliance ratings when averaged out between clients and therapists ($\bar{x}_{ftf} = 46.4$, $\bar{x}_{bCBT} = 46.8$). Furthermore, the correlation between WAI-C and WAI-T varied between treatment condition subsets. In bCBT, WAI-C and WAI-T correlated significantly at $r = 0.62$ ($p = .002$) compared to ftf CBT where they correlated at a non-significant $r = 0.32$ ($p = .087$). Thus, there seemed to be more agreement between clients and therapists in the bCBT group. Steiger's Z-test on these two correlation coefficients gave significant results ($Z = 2.57$, $p = .010$) and Zou's confidence intervals had relatively narrow values and did not cross zero (95% CI [0.0783, 0.6131]). The combined WAI-C and WAI-T item deviations (deviation from the combined mean, Fig. 1), revealed that most items centred around the mean with some right skew (Fig. 3). Item 4 accounted for most of this skew due to a high positive value ($z = 2.2$), followed by item 10 ($z = 1.40$). Keep in mind that WAI-C and WAI-T may not be directly comparable due to being formulated from opposite perspectives, but they are almost identical except from perspective (client vs. therapist). The degree to which the formulations are equivalent may mirror item deviation, that is, similar WAI-C and WAI-T formulations facilitate less deviation. To avoid this issue, we looked at the deviation in items within inventories and treatment

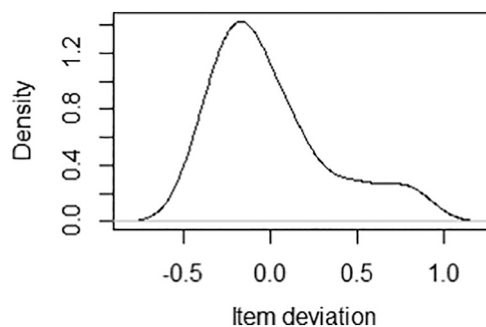


Fig. 3. Combined item deviation distribution.

conditions. When we did this, the only significant standardized score (< -1.96 or > 1.96) was on item 4 in bCBT-WAI-C ($z = 2.25$) and ftf CBT WAI-T ($z = 1.97$). Notable scores were also seen on item 4 in bCBT-WAI-T ($z = 1.90$), item 10 in ftf-WAI-C ($z = 1.70$) and item 7 having notably negative scores in bCBT-WAI-C ($z = -1.68$). Analyses of deviations on dimension level (task, bond and goal) revealed considerable differences in z-scores based on client vs. therapist perspective and treatment condition (Fig. 4). From dimension level analyses, it was apparent that the goal dimension was consistently evaluated higher than the task and bond dimensions in all subsets, most prominently in ftf CBT-WAI-C. It also showed that therapists evaluated bond higher than clients, whilst clients rated goal comparatively high and that therapists rated task comparatively low.

WAI-C (item 4): “My therapist does not understand what I am trying to accomplish in therapy”.

WAI-T (item 4): “I have doubts about what we are trying to accomplish in therapy”.

© A. O. Horvath, 1981, 1982, 1984, 1991; Revision Tracey & Kokotowitc 1989.

In the slope prediction models (Table 2), WAI-C and WAI-T were first used as separate independent predictors of total sample outcome. This revealed that WAI-C was not significantly predictive of outcome ($b = 0.00$, $p = .845$), but WAI-T was when adjusting for potential confounds ($b = 0.00$, $p = .044$). There was no evidence of problematic multicollinearity in this model ($VIF_i = 1.23$). The joint WAI model based on the total sample was significant ($b = 0$, $p = .039$). However, the coefficient of determination was minor ($R^2_{adj} = 0.07$) (Tables 2 & 3), indicating that this predictor only accounted for around 7% of the variance. Predicting joint WAI within ftf and bCBT models were non-significant ($b_{ftf} = 0.00$, $p_{ftf} = 0.832$; $b_{bCBT} = 0.00$, $p_{bCBT} = 0.133$). The interaction model using joint WAI showed a non-significant interaction with the treatment condition group ($b = 0.00$, $p = .359$) and had a rather punitive adjusted R-squared ($R^2 = 0.15$, $R^2_{adj} = 0.09$) (Tables 2 & 3).

5. Discussion

The aim of this study was to map out differences in working alliance between clients and therapists as well as between ftf CBT and bCBT. Another aim was to use the working alliance to predict therapy outcome. We approached the topic from different angles to elucidate correlations, item and dimension deviations and predictive value of the working alliance in ftf CBT compared to bCBT. We found moderate agreement between WAI-C and WAI-T and that WAI-C was rated slightly higher than WAI-T, which are common findings in previous research, but this pattern remains to be established in bCBT (Blais et al., 2010; Horvath and Bedi, 2002; Marmarosh and Kivlighan, 2012; Kooistra et al., 2020; Tryon et al., 2007; Vermark et al., 2019). One hypothesis for this difference could be that clients may compare the working alliance with other health professionals (e.g., physicians), whilst therapists rather compare with other clients (Tryon et al., 2007). A reverse pattern where WAI-T is rated higher than WAI-C might indicate poor therapy

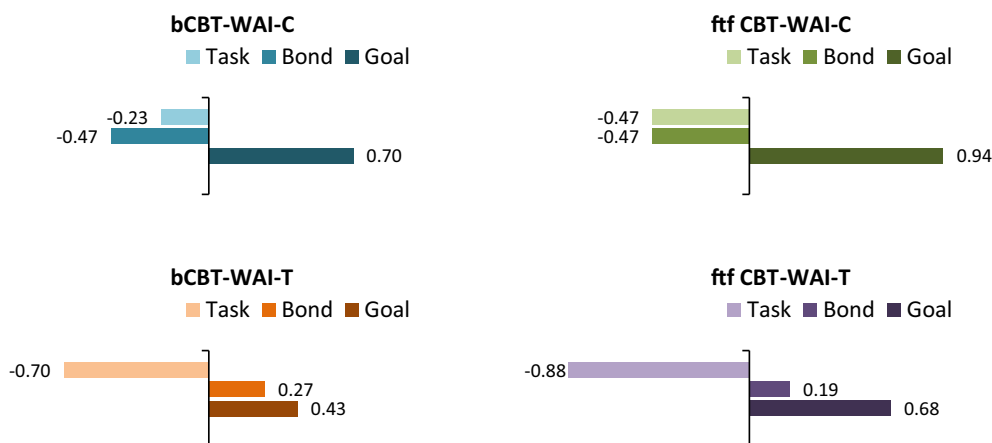


Fig. 4. All WAI dimension z-scores from their respective subset means.

Table 2
Slope prediction models.

Model			Unadjusted				Adjusted			
			B	SE	t	p	B	SE	t	p
1	Total sample (separate)	(Constant)	-0.01	0.01	-1.80	0.078	-0.01	0.01	-1.77	0.084
		WA-C	0.00	0.00	-0.35	0.729	0.00	0.00	-0.20	0.845
		WAI-T	0.00	0.00	-1.61	0.114	0.00	0.00	-2.08	0.044*
2	Total sample (mean)	(Constant)	-0.01	0.01	-1.76	0.084	-0.01	0.01	-1.72	0.093
		Joint WAI	0.00	0.00	-1.85	0.070	0.00	0.00	-2.13	0.039*
3	Within ftf	(Constant)	-0.03	0.02	-1.93	0.065	-0.03	0.01	-2.05	0.051
		Joint WAI	0.00	0.00	-0.05	0.958	0.00	0.00	-0.22	0.832
4	Within bCBT	(Constant)	-0.01	0.00	-3.16	0.005**	-0.01	0.01	-0.63	0.536
		Joint WAI	0.00	0.00	-1.93	0.067	0.00	0.00	-1.57	0.133
5	Interaction	(Constant)	-0.03	0.01	-2.38	0.021*	-0.02	0.01	-2.30	0.026*
		Joint WAI	0.00	0.00	-0.15	0.884	0.00	0.00	-0.40	0.691
		Group	0.02	0.02	1.23	0.226	0.02	0.01	1.13	0.265
Joint WAI × Group			0.00	0.00	-1.02	0.314	0.00	0.00	-0.93	0.359

Dependent variable: Random slopes in LMM from the RCT.

* $p < .05$.

** $p < .01$.

Table 3
Regression statistics.

Model	Multiple R ²	Unadjusted		n	Multiple R ²	Adjusted		n
		Adjusted R ²				Adjusted R ²		
1	0.08	0.04		49	0.11	0.07		46
2	0.07	0.05		50	0.09	0.07		47
3	0.00	-0.04		27	0.00	-0.04		26
4	0.15	0.11		22	0.11	0.07		20
5	0.13	0.08		48	0.15	0.09		54

progression (Tryon et al., 2007).

Another explanation might be that bCBT therapists are more accurate in their evaluations of the working alliance than clients, because patients may confound their ratings from both ftf CBT sessions and on-line modules, whereas therapists rather rate on the basis of ftf CBT sessions alone (Kooistra et al., 2020). However, we would argue that the program and the therapist both elicit a sense of alliance in the participant, thus the subjective experience of this aggregated phenomenon might be a more accurate representation of the therapeutic alliance in the blended format of treatment delivery. Less is known about what mediates low ratings from therapists, but there are indications that therapists' attachment style influence ratings since therapists with more avoidant attachment styles tend to report weaker working alliances (O'Connor et al., 2019). Nonetheless, in some instances it might be

favourable for clients and therapists to have opposing attachment styles (Bucci et al., 2016). Interestingly, WAI-C and WAI-T rating convergence was higher for the bCBT group. It could be speculated that the more strict structure afforded by the computer-based modules may lead to a clearer depiction of the objectives in therapy.

The working alliance items distributed similarly for both WAI-C and WAI-T relative to the combined mean. This is to be expected due to the reliable psychometric properties of the working alliance inventory. The right skew in item deviation distribution might simply be caused by an absence of the lowest ratings and/or a small number of very high ratings. Item 4 in ftf CBT-WAI-C was of particular interest since this item was the only one significantly deviating from the mean. This item is related to the perception of accomplishment in therapy and is thus tied to the goal dimension. This pointed to clients having better perceptions than

therapists in this regard, thus being one of the drivers of the aforementioned finding that clients rated the working alliance as stronger on the whole. The distribution of mean scores of the dimensions in the working alliance also deviated in relation to treatment conditions. The goal dimension was higher in ftf CBT, and the task dimension was higher in bCBT, relative to each other. The bond dimension ratings were comparable between treatment conditions, and an interesting observation was that bond ratings were higher among the therapists than among clients. In a narrative review, Berger (2017) suggested that the task dimension and the goal dimensions were of particular importance for predicting outcomes, representing an intriguing prospect for future research, since the treatment conditions were dissimilar across these dimensions in the present study.

The joint WAI score significantly predicted treatment outcome, which appeared to be driven by the WAI-T, meaning the therapist ratings of the alliance gave a better estimate of treatment outcome than the client ratings. This is contrary to some general working alliance research that has found WAI-C to be a better predictor of outcome than WAI-T (Cameron et al., 2018). However, it is in line with other studies on bCBT, who have found WAI-T to be comparable or even a better predictor of outcome and suggest that this pattern may be specific for bCBT (Kooistra et al., 2020; Vernmark et al., 2019). Using the joint working alliance from WAI-C and WAI-T mean for all participants proved to be more parsimonious, but had the same explained variance. The idea behind this model was to see whether the conjoint rating of both parties was a better predictor than each separate rating.

Within ftf CBT and bCBT, adjusted models using the joint WAI were not significant, indicating that the predictive values of the working alliance didn't change within the treatment conditions. There was no interaction with treatment condition in the interaction model, indicating that the treatment condition didn't influence the working alliance and outcome relationship. Zilcha-Mano et al. (2014) have raised the question of causal directionality of the working alliance-outcome association. Traditionally the working alliance has been posited as an active ingredient in the treatment process with inherent therapeutic value, accounting for treatment outcome variance in itself. However, it may be argued that the working alliance is rather influenced by symptom change and that alleviation of symptoms and remission leads to a better working alliance (Zilcha-Mano et al., 2014).

It doesn't follow from these models that predict outcome based on the working alliance, that the working alliance leads to better outcome. In fact, it might as well be true that patients who quickly respond to treatment develop better working alliances, indicating bidirectionality between outcome and working alliance. An interesting line of inquiry would be to investigate weekly working alliance and depression measures, e.g. by using Granger causality (Molenaar, 2019). The working alliance seems to predict outcome from session to session, even after controlling for preceding symptom improvement (Falkenström et al., 2016; Falkenström et al., 2014). To our knowledge, this is yet to be explored in the context of bCBT.

5.1. Strengths and limitations

The strengths of this study stemmed from high treatment fidelity and a direct comparison of two formats of delivery of CBT. Additionally, the use of various diverse measures in the RCT allows for fine-grained analyses. Using WAI from both client and therapist aided the content validity of the phenomenon we intended to capture herein. However, the present investigation is vulnerable to the methodological limitations of exploratory analysis (e.g. base rate neglect) when testing multiple hypotheses and the risk of spurious relationships. Due to the small to moderate sample size, caution is warranted with regard to the generalizability of the conclusions drawn from this study.

6. Conclusion

The findings in this study suggested that the working alliance was equally strong in blended care and face-to-face therapy. Findings also suggested that working alliance was predictive of outcome, when working alliance was averaged out between clients and therapists and that this is mostly due to therapist ratings. Furthermore, this association didn't seem to interact with treatment conditions, meaning that treatment outcome was predicted equally well from working alliance in both ftf CBT and bCBT. Additionally, purely descriptive findings indicated that clients rated the working alliance higher than therapists and that those clients and therapists appeared to have more uniform ratings in the bCBT condition. In the working alliance inventory, the ftf CBT condition scored higher on the goal dimension for both clients and therapists and the bCBT group scored higher in the task dimension. The treatment conditions had similar ratings on bond, but therapists rated the bond dimension higher than clients in both treatment conditions. Future research is needed to further elucidate the item deviation patterns to see if certain items are consistently more prone to diminish working alliance in bCBT. More work is also needed on the causal directionality of the working alliance-outcome association in bCBT. Finally, future research is needed to establish whether therapist-rated alliance is indeed more closely associated with outcome than client-rated alliance in bCBT.

Funding

Granted from the Research Fund of the Mental Health Services of Southern Denmark, J.B. Winsløvs Vej 20 indg. 220B, 5000 Odense C. And from the Innovation Fund Denmark, Østergade 26 A, 4. sal, DK – 1100 København K as part of the project ENTER (ID nr.: 5159-00002B). Both are public funds. None of the funds have had any role in the design of the study, nor in collection of data, analysis of data, interpretation of data, nor writing the manuscript.

Declaration of competing interest

The authors declare no conflicts of interest.

References

- American Psychiatric Association. (2000). Diagnostic and Statistical Manual of Mental Disorders (4th ed., text rev.). Washington, DC: Author.
- Andrews, G., Basu, A., Cuijpers, P., Craske, M.G., McEvoy, P., English, C.L., Newby, J.M., 2018. Computer therapy for the anxiety and depression disorders is effective, acceptable and practical health care: an updated meta-analysis. *J. Anxiety Disord.* 55, 70–78. <https://doi.org/10.1016/j.janxdis.2018.01.001>.
- Bates, Maechler, Bolker, Walker (2015). Fitting linear mixed-effects models using lme4. *J. Stat. Softw.*, 67(1), 1–48. doi:10.18637/jss.v067.i01.
- Berger, T., 2017. The therapeutic alliance in internet interventions: a narrative review and suggestions for future research. *Psychother. Res.* 27 (5), 511–524. <https://doi.org/10.1080/10503307.2015.1119908>.
- Blais, M.A., Jacobo, M.C., Smith, S.R., 2010. Exploring therapeutic alliance in brief inpatient psychotherapy: a preliminary study. *Clin. Psychol. Psychother.* 17, 386–394. <https://doi.org/10.1002/cpp.666>.
- Bordin, E.S., 1979. The generalizability of the psychoanalytic concept of the working alliance. *Psychother. Theory Res. Pract.* 16 (3), 252–260. <https://doi.org/10.1037/h0085885>.
- Bucci, S., Seymour-Hyde, A., Harris, A., Berry, K., 2016. Client and therapist attachment styles and working alliance. *Clin. Psychol. Psychother.* 23, 155–165. <https://doi.org/10.1002/cpp.1944>.
- Cameron, S.K., Rodgers, J., Dagnan, D., 2018. The relationship between the therapeutic alliance and clinical outcomes in cognitive behaviour therapy for adults with depression: a meta-analytic review. *Clin. Psychol. Psychother.* 25 (3), 446–456. <https://doi.org/10.1002/cpp.2180>.
- Carlbring, P., Andersson, G., Cuijpers, P., Riper, H., Hedman-Lagerlöf, E., 2018. Internet-based vs. face-to-face cognitive behavior therapy for psychiatric and somatic disorders: an updated systematic review and meta-analysis. *Cogn. Behav. Ther.* 47 (1), 1–18. <https://doi.org/10.1080/16506073.2017.1401115>.
- Cohen, J., 1992. A power primer. *Psychol. Bull.* 112 (1), 155–159. <https://doi.org/10.1037/0033-2909.112.1.155>.

- Devilley, G.J., Borkovec, T.D., 2000. Psychometric properties of the credibility/expectancy questionnaire. *J. Behav. Ther. Exp. Psychiatry* 31 (2), 73–86. [https://doi.org/10.1016/S0005-7916\(00\)00012-4](https://doi.org/10.1016/S0005-7916(00)00012-4).
- Falkenström, F., Granström, F., Holmqvist, R., 2014. Working alliance predicts psychotherapy outcome even while controlling for prior symptom improvement. *Psychother. Res.* 24 (2), 146–159. <https://doi.org/10.1080/10503307.2013.847985>.
- Falkenström, F., Ekeblad, A., Holmqvist, R., 2016. Improvement of the working alliance in one treatment session predicts improvement of depressive symptoms by the next session. *J. Consult. Clin. Psychol.* 84 (8), 738–751. <https://doi.org/10.1037/ccp0000119>.
- Flückiger, C., Del Re, A.C., Wampold, B.E., Horvath, A.O., 2018. The alliance in adult psychotherapy: a meta-analytic synthesis. *Psychotherapy (Chic.)* 55 (4), 316–340. <https://doi.org/10.1037/pst0000172>.
- Friedman, L., Samberg, E., 1994. Richard Sterba's (1934) "The Fate of the Ego in Analytic Therapy". *J. Am. Psychoanal. Assoc.* 42 (3), 863–873. <https://doi.org/10.1177/000306519404200310>.
- Gelso, C., 2014. A tripartite model of the therapeutic relationship: theory, research, and practice. *Psychother. Res.* 24 (2), 117–131. <https://doi.org/10.1080/10503307.2013.845920>.
- Global Burden of Disease Study (2017) Reference Life Table. Seattle, United States: Institute for Health Metrics and Evaluation (IHME), 2018.
- Greenson, R.R., 2008. The working alliance and the transference neurosis. *Psychoanal. Q.* 77 (1), 77–102. <https://doi.org/10.1002/j.2167-4086.2008.tb00334.x>.
- Hatcher, R.L., Gillaspay, J.A., 2006. Development and validation of a revised short version of the working alliance inventory. *Psychother. Res.* 16 (1), 12–25. <https://doi.org/10.1080/10503300500352500>.
- Horvath, A.O., 2018. Research on the alliance: knowledge in search of a theory. *Psychother. Res.* 28 (4), 499–516. <https://doi.org/10.1080/10503307.2017.1373204>.
- Horvath, A.O., Bedi, R.P., 2002. The alliance. In: Norcross, J.C. (Ed.), *Psychotherapy Relationships That Work: Therapist Contributions and Responsiveness to Patients* (p. 37–69). Oxford University Press.
- Horvath, A.O., Symonds, B.D., 1991. Relation between working alliance and outcome in psychotherapy: A meta-analysis. *Journal of Counseling Psychology* 38 (2), 139–149. <https://doi.org/10.1037/0022-0167.38.2.139>.
- Karyotaki, E., Riper, H., Twisk, J., Hoogendoorn, A., Kleiboer, A., Mira, A., Cuijpers, P., 2017. Efficacy of self-guided internet-based cognitive behavioral therapy in the treatment of depressive symptoms: a meta-analysis of individual participant data. *JAMA Psychiat.* 74 (4), 351–359. <https://doi.org/10.1001/jamapsychiatry.2017.0044>.
- Kleiboer, A., Smit, J., Bosmans, J., Ruwaard, J., Andersson, G., Topooco, N., Berger, T., Krieger, T., Botella, C., Baños, R., Chevreul, K., Araya, R., Cerga-Pashoja, A., Cieślak, R., Rogala, A., Vis, C., Draisma, S., van Schaik, A., Kemmeren, L., Ebert, D., Riper, H., 2016. European COMPARative Effectiveness research on blended Depression treatment versus treatment-as-usual (E-COMPARED): study protocol for a randomized controlled, non-inferiority trial in eight European countries. *Trials* 17 (1), 387. <https://doi.org/10.1186/s13063-016-1511-1>.
- Kooistra, L.C., Wiersma, J.E., Ruwaard, J., Neijenhuis, K., Lokkerbol, J., van Oppen, P., Smit, F., Riper, H., 2019. Cost and effectiveness of blended versus standard cognitive behavioral therapy for outpatients with depression in routine specialized mental health care: pilot randomized controlled trial. *J. Med. Internet Res.* 21 (10), e14261 <https://doi.org/10.2196/14261>.
- Kooistra, L., Ruwaard, J., Wiersma, J., van Oppen, P., Riper, H., 2020. Working alliance in blended versus face-to-face cognitive behavioral treatment for patients with depression in specialized mental health care. *J. Clin. Med.* 9 (2), 347. <https://doi.org/10.3390/jcm9020347>.
- Kroenke, K., Spitzer, R.L., Williams, J.B., 2001. The PHQ-9: validity of a brief depression severity measure. *J. Gen. Intern. Med.* 16 (9), 606–613. <https://doi.org/10.1046/j.1525-1497.2001.016009606.x>.
- Marmarosh, C.L., Kivlighan Jr., D.M., 2012. Relationships among client and counselor agreement about the working alliance, session evaluations, and change in client symptoms using response surface analysis. *J. Couns. Psychol.* 59 (3), 352–367. <https://doi.org/10.1037/a0028907>.
- Mathiasen, K., Andersen, T.E., Riper, H., Kleiboer, A.A., Roessler, K.K., 2016. Blended CBT versus face-to-face CBT: a randomised non-inferiority trial. *BMC Psychiatry* 16 (1), 432. <https://doi.org/10.1186/s12888-016-1140-y>.
- Mathiasen, K., Riper, H., Andersen, T.E., Roessler, K.K., 2018. Guided internet-based cognitive behavioral therapy for adult depression and anxiety in routine secondary care: observational study. *J. Med. Internet Res.* 20 (11), e10927 <https://doi.org/10.2196/10927>.
- Mol, M., Dozeman, E., Provoost, S., van Schaik, A., Riper, H., Smit, J.H., 2018. Behind the scenes of online therapeutic feedback in blended therapy for depression: mixed-methods observational study. *J. Med. Internet Res.* 20 (5), e174 <https://doi.org/10.2196/jmir.9890>.
- Molenaar, P., 2019. Granger causality testing with intensive longitudinal data. *Prev. Sci.* 20 (3), 442–451. <https://doi.org/10.1007/s11121-018-0919-0>.
- Munder, T., Wilmers, F., Leonhart, R., Linster, H.W., Barth, J., 2010. Working Alliance Inventory-Short Revised (WAI-SR): psychometric properties in outpatients and inpatients. *Clin. Psychol. Psychother.* 17 (3), 231–239. <https://doi.org/10.1002/cpp.658>.
- O'Connor, S., Kivlighan Jr., D.M., Hill, C.E., Gelso, C.J., 2019. Therapist–client agreement about their working alliance: associations with attachment styles. *J. Couns. Psychol.* 66 (1), 83–93. <https://doi.org/10.1037/cou0000303>.
- R Core Team, 2020. R: A Language and Environment for Statistical Computing. In: R Foundation for Statistical Computing. Austria. URL, Vienna. <https://www.R-project.org/>.
- Tryon, G.S., Blackwell, S.C., Hammel, E.F., 2007. A meta-analytic examination of client-therapist perspectives of the working alliance. *Psychother. Res.* 17 (6), 629–642. <https://doi.org/10.1080/10503300701320611>.
- Vernmark, K., Hesser, H., Topooco, N., Berger, T., Riper, H., Luuk, L., Backlund, L., Carlbring, P., Andersson, G., 2019. Working alliance as a predictor of change in depression during blended cognitive behaviour therapy. *Cognitive Behaviour Therapy* 48 (4), 285–299. <https://doi.org/10.1080/16506073.2018.1533577>.
- World Health Organization (Ed.), 2019. ICD-10: International Statistical Classification of Diseases and Related Health Problems: Tenth Revision, 2nd ed. World Health Organization. <https://apps.who.int/iris/handle/10665/42980>.
- Wright, J.H., Wright, A.S., Albano, A.M., Basco, M.R., Goldsmith, L.J., Raffield, T., Otto, M.W., 2005. Computer-assisted cognitive therapy for depression: maintaining efficacy while reducing therapist time. *Am. J. Psychiatry* 162 (6), 1158–1164. <https://doi.org/10.1176/appi.ajp.162.6.1158>.
- Zhou, T., Li, X., Pei, Y., Gao, J., Kong, J., 2016. Internet-based cognitive behavioural therapy for subthreshold depression: a systematic review and meta-analysis. *BMC Psychiatry* 16 (1), 356. <https://doi.org/10.1186/s12888-016-1061-9>.
- Zilcha-Mano, S., Dinger, U., McCarthy, K.S., Barber, J.P., 2014. Does alliance predict symptoms throughout treatment, or is it the other way around? *J. Consult. Clin. Psychol.* 82 (6), 931–935. <https://doi.org/10.1037/a0035141>.