



# The working alliance in a randomized controlled trial comparing Internet-based self-help and face-to-face cognitive behavior therapy for chronic tinnitus



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## ABSTRACT

**Objective:** This study (ID: NCT01205906) compared the impact of the working alliance between the therapist and the client on treatment outcome in a group and an Internet-based cognitive behavior therapy (GCBT vs. ICBT) for chronic tinnitus.

**Methods:** The Working Alliance Inventory – Short Revised (WAI-SR, scale range: 1–5) was administered to 26 GCBT and 38 ICBT participants after treatment weeks 2, 5, and 9, and the Tinnitus Handicap Inventory (THI) before and after the treatment.

**Results:** High alliance ratings were found in both ICBT (WAI-SR total scores at week 9:  $M = 3.59$ ,  $SD = 0.72$ ) and GCBT (WAI-SR total scores at week 9:  $M = 4.20$ ,  $SD = 0.49$ ), but significantly higher ratings occurred in GCBT on most WAI-SR scales ( $ps < .01$ ). Significant time  $\times$  group interactions for most WAI-SR scales indicated differences in alliance growth patterns between the treatments ( $ps < .001$ ). Residual gain scores for the therapy outcome measure 'tinnitus distress' were significantly correlated with the agreement on treatment tasks between therapist and client in ICBT ( $r = .40$ ,  $p = .014$ ) and with the affective therapeutic bond in GCBT ( $r = .40$ ,  $p = .043$ ) at mid-treatment (week 5).

**Conclusion:** More time was needed to build a strong alliance in ICBT although GCBT yielded generally higher alliance ratings. Moreover, different aspects of the therapeutic alliance might be important for treatment success in ICBT versus GCBT.

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## 1. Introduction

The therapeutic alliance is defined by the achievement of a collaborative stance between a client and a therapist (Bordin, 1979, 1994). Bordin (1979, 1994) proposed three components of the working alliance, which are relevant in all change processes in psychotherapy: agreement on therapeutic goals, consensus on tasks, and the bond between client and therapist. Four separate meta-analyses have reported a robust, albeit small, relation between the quality of the working alliance and treatment outcome across a broad spectrum of psychological treatments in a variety of client/problem contexts (Martin et al., 2000;

Horvath et al., 2011a; Horvath et al., 2011b; Horvath and Bedi, 2002). Furthermore, there is evidence that the alliance not only plays a crucial role in psychotherapy approaches, where the alliance is the central aspect of the treatment (e.g., psychoanalysis, client centered therapy), but also in psychotherapeutic treatments that concentrate on behavioral interventions such as cognitive behavior therapy (CBT; Flückiger et al., 2012).

The Internet has gained importance as an alternative way to deliver psychological treatments for somatic health problems (Andersson et al., 2011). Research in this area has mainly focused on Internet-based CBT (ICBT) programs (Ritterband et al., 2006; Andersson et al., 2009b). Several studies have reported similar outcomes of ICBT compared with regular face-to-face therapy across different mental disorders such as anxiety disorders (Kiroopoulos et al., 2008; Bergström et al., 2010; Carlbring et al., 2005; Andrews et al., 2011; Hedman et al., 2011a), depression (Wagner et al., 2014; Andersson et al., 2013), and mental health concerns associated with bodily symptoms such as health

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anxiety (Hedman et al., 2011b) and tinnitus (Kaldo et al., 2008; Jasper et al., 2014). Despite the growing body of evidence regarding the effects of ICBT, the mechanisms underlying these favorable outcomes are still largely unknown (Andersson, 2010; Andersson et al., 2012). Personal contact with a supportive person is often discussed as an important aspect in ICBT. Low-intensity guidance by a therapist through a highly standardized self-help program (e.g., via e-mail), or even a clear deadline for a live follow-up interview, tends to reduce attrition rates and enhance the treatment effects (Andersson et al., 2009a; Spek et al., 2007; Nordin et al., 2010).

The working alliance might explain the importance of guidance by a therapist in ICBT. Although the client in an ICBT program may never meet the therapist in person, their communication via Internet may be seen as a therapeutic interaction (Andersson et al., 2012). There is some evidence that the therapist in ICBT applies common therapist behaviors such as empathetic utterances or alliance bolstering (Andersson et al., 2012; Paxling et al., 2013). Moreover, the self-help text itself might help to form a therapeutic alliance, because a client might assume that an empathic clinician prepared the text material (Andersson et al., 2012). Common factors that influence the therapeutic relationship (e.g., empathy and warmth) may be incorporated by the authors in their writings (Richardson et al., 2010). Participants' ratings of the therapeutic alliance are therefore likely to be based on information obtained by online interactions with a therapist, interactions with a treatment system, and the self-help texts (Andersson et al., 2012).

The results of a recent review indicated that a positive alliance can be formed over the Internet (Sucala et al., 2012). High alliance ratings were reported for online interventions regarding posttraumatic stress disorder (PTSD; Knaevelsrud and Maercker, 2006; Knaevelsrud and Maercker, 2007; Wagner et al., 2012; Klein et al., 2009a), depression (Andersson et al., 2012; Preschl et al., 2011; Ruwaard et al., 2009), anxiety disorders (Kiropoulos et al., 2008; Andersson et al., 2012; Klein et al., 2009b; Bergman Nordgren et al., 2013), and recurrent headache (Trautmann and Kröner-Herwig, 2010). Furthermore, there is evidence that the strength of the therapeutic alliance in online and face-to-face therapy is comparable (Sucala et al., 2012). This evidence mainly stems from studies that compared the working alliance in an online sample with data on face-to-face therapy concerning a variety of mental health concerns (Cook and Doyle, 2002; Reynolds et al., 2006). Two studies even applied a randomized control group design (Kiropoulos et al., 2008; Preschl et al., 2011), one featuring depression (Preschl et al., 2011), and the other panic disorders (Kiropoulos et al., 2008).

Research on the role of the therapeutic alliance as a predictor of treatment outcome in online treatments is scarce and the results have been rather contradictory. A significant association between an intensive therapeutic alliance and a better therapy outcome was found in two studies on ICBT for anxiety disorders (Bergman Nordgren et al., 2013; Anderson et al., 2012), and for an online intervention for PTSD (Knaevelsrud and Maercker, 2007; Wagner et al., 2012); but another study by Knaevelsrud and Maercker (Knaevelsrud and Maercker, 2006), which investigated the same online treatment for PTSD, did not report a significant relationship between alliance and outcome. Preschl et al. (2011) and Andersson et al. (2012) also did not find a significant relationship with the primary outcome measures in the context of highly structured ICBT for depression, generalized anxiety disorders, and social anxiety.

In sum, research on the therapeutic alliance in Internet interventions is scant and it is particularly rare to find randomized controlled trials (RCTs) that directly compare the working alliance in ICBT with that of face-to-face psychotherapy. The mixed results of the little research that has been done leave it unclear whether the therapeutic alliance is as relevant for treatment success in ICBT as it is in regular face-to-face psychotherapy. Concerning ICBT for bodily related mental health issues in particular, there has not been much research targeting the therapeutic alliance, therefore more studies are necessary to address this topic.

On the basis of these findings, we decided to investigate working alliance ratings in a RCT directly comparing ICBT with cognitive behavioral group therapy (GCBT), in a sample of patients with chronic tinnitus. In order to enhance the external validity of our results we decided to compare a standard face-to-face treatment with an Internet-based CBT for tinnitus, both of which have already been evaluated in several studies and applied in routine care (Jasper et al., 2014). We predicted that a strong therapeutic alliance would be generated in both treatment groups and that the strength of the alliance would not differ significantly between the two types of therapy. The second aim of the current study was to examine the association between the working alliance and treatment outcome.

## 2. Method

### 2.1. Participants

A total of 128 participants were enrolled between April 2010 and March 2011 following recruitment via public media, and tinnitus-related health-care sources (e.g., the German Tinnitus Association, ear–nose–throat practitioners). Inclusion was based on the following criteria: (a) age at least 18 years, (b) a score  $\geq 18$  on the Tinnitus Handicap Inventory (THI, Newman et al., 1996) or a score  $\geq 8$  on the Mini-Tinnitus Questionnaire (Mini-TQ; Hiller and Goebel, 2004), (c) tinnitus duration of at least 6 months, (d) tinnitus as primary problem, (e) Internet access, (f) willingness and ability to attend the weekly group sessions, (g) no anticipated absence of more than 2 weeks during the course of the study, (h) no CBT for tinnitus within the last 2 years, (i) no major medical or psychiatric condition, and (j) no acute suicidality. For economic reasons, inclusion of participants was based on a three-stage selection procedure (i.e., pre-assessment, telephone interview, face-to-face interview). First, individuals who reported interest in participating in the trial received written information via a study webpage and access to an online pre-assessment. Following this, potential participants underwent a brief telephone screening and then a face-to-face interview. The telephone interview focused on the willingness and possibility to participate in both treatments (i.e., inclusion criteria e–g). The face-to-face interview primarily aimed at assessing tinnitus distress, as well as other medical and psychiatric conditions (i.e., inclusion criteria c–d, h–j). Comorbid psychiatric conditions were checked using the International Diagnostic Checklists for DSM-IV (Janca and Hiller, 1996). The telephone and face-to-face interviews were both standardized.

### 2.2. Procedure and study design

Data were collected in association with a randomized controlled study comparing the effects of ICBT and GCBT on chronic tinnitus (Jasper et al., 2014). The study was designed as a RCT. It was approved by the Ethics Committee of the Department of Psychology of the University of Mainz (Germany) and registered at [www.clinicaltrials.gov](http://www.clinicaltrials.gov) (ID: NCT01205906). After signing informed consent statements, participants were randomized to one of three conditions: ICBT, GCBT, or an online discussion forum (DF) as an active control group. After a 10-week waiting period, DF participants were randomly assigned to either ICBT or GCBT. Randomization was achieved by an online service which uses a pseudo-random number algorithm ([www.randomization.com](http://www.randomization.com)).

Results on the treatment effects of the two interventions are presented in the paper by Jasper et al. (2014). Statistical analyses revealed that the DF did not lead to significant changes in tinnitus distress and that participation in ICBT or GCBT resulted in equally significant improvements in tinnitus distress (Jasper et al., 2014). On the basis of these results, we decided to include the DF participants in our study according to their randomization (i.e., either ICBT or GCBT), with the aim to gain larger sample sets for the current analyses.

The working alliance was assessed at treatment weeks 2, 5, and 9. In ICBT, the working alliance was assessed online, whereas GCBT participants received a paper and pencil version immediately after the relevant sessions. All outcome data were assessed via the Internet before treatment (pre-treatment) and directly after the last treatment week (post-treatment).

### 2.3. Treatments

Both CBT programs (i.e., ICBT, GCBT) are regarded as standard treatments for tinnitus in the respective treatment context (i.e., Internet vs. face-to-face). The current ICBT intervention is an adapted German version of a Swedish treatment manual (Kaldo and Andersson, 2004), which has been evaluated with promising results in routine care (Kaldo et al., 2013; Kaldo-Sandström et al., 2004). In the context of face-to-face therapy, most of the well-tested CBT programs for tinnitus are delivered in a group format (Hesser et al., 2011). The GCBT treatment has been applied for many years in several psychotherapeutic outpatient and inpatient clinics. Accordingly, its efficacy has been confirmed in several studies (Hiller and Haerkötter, 2005; Kröner-Herwig et al., 2003).

The aim of both CBT treatments was to reduce psychological tinnitus distress, not physical tinnitus loudness or intensity. Both treatments were of equal length (10 weeks) and combined standard CBT contents (e.g., focus exercising, cognitive restructuring) with relaxation techniques. As both treatments were developed and evaluated with regard to their specific setting (i.e., Internet/single vs. face-to-face/group), the arrangement of the interventions and the way the tasks were provided differed. In ICBT, the different parts of the interventions were presented as self-help text modules. Therefore, particular emphasis was placed on a very clear and concrete description of the treatment tasks. Typically, the participants first read specific modules, practiced the exercises in daily life, and had the possibility of communicating with the therapist afterwards (i.e., once a week via a secured online messaging system). In GCBT, the treatment tasks were worked out together in the group sessions and were based on various exercises in combination with psychoeducation. Participants were given handouts and encouraged to complete homework assignments. The interaction and exchange of experiences of the group members were of particular importance in the sessions.

Both CBT treatments were conducted by the same team of clinical psychologists who were either certified CBT therapists (CW, MK), or in an advanced state of their CBT training (IC, KJ). All therapists received appropriate training and continued supervision to ensure adherence to the protocols.

More information on the two treatment rationales is provided by Jasper et al. (2014). Their analyses revealed that the effects of both treatments on tinnitus distress were comparable. Moreover, analyses of the amount of attended treatment modules in ICBT and correspondingly the treatment sessions in GCBT, indicated that participants in both conditions received comparable levels of treatment. The average time per week devoted by the therapist to each participant was found to be 11.22 min in GCBT and 13.76 min in ICBT (Jasper et al., 2014).

### 2.4. Measures

#### 2.4.1. Working Alliance Inventory – Short Revised (WAI-SR)

Working alliance was assessed by the revised short form of the German version of the Working Alliance Inventory (Munder et al., 2010). The WAI-SR assesses three key aspects of the therapeutic alliance: (a) agreement on therapeutic tasks (*tasks*), (b) agreement on therapeutic goals (*goals*), and (c) the affective bond (*bond*). The wording of some items was slightly modified to be suitable for ICBT (e.g., treatment instead of therapy). The internal consistency was from acceptable to satisfying for the current sample at each assessment, with ICBT obtaining Cronbach's  $\alpha = .87$ –.93 for the total score

(subscales:  $\alpha = .62$ –.91), and GCBT obtaining Cronbach's  $\alpha = .87$ –.94 for the total score (subscales:  $\alpha = .69$ –.90) (Nunnally, 1978). Suitable normative data for the interpretation of the WAI-SR are not available. On the basis of the five-point Likert-scale response format of the WAI-SR (*seldom* = 1, *sometimes* = 2, *fairly often* = 3, *very often* = 4, *always* = 5), the mean scores of the WAI-SR scales (i.e., the sum across the scale items divided by the number of items) were labeled by the authors of the current manuscript as low (score: 1.00–2.44), medium (score: 2.45–3.44), and high/positive (score: 3.45–5.00).

#### 2.4.2. Tinnitus Handicap Inventory (THI)

The German version of the THI was applied as a widely used self-report measure to assess subjective tinnitus handicap (Newman et al., 1996; Kleinjung et al., 2007). The THI consists of 25 items, scored as either 0, 2, or 4 and summed into a total scale score ranging from 0 to 100. It has a reported internal consistency of  $\alpha = .93$  (Newman et al., 1996; Kleinjung et al., 2007). The total score allows to determine the severity of tinnitus distress experienced, with a score of 0–16 indicating no handicap, 18–36 a mild handicap, 38–56 a moderate handicap, and 58–100 indicating a severe handicap (Newman et al., 1998). The internal consistency for the current sample was good, with  $\alpha = .87$ .

### 2.5. Data analysis

Statistical analyses were conducted using PASW Statistics 18.0. A dropout analysis was calculated for the GCBT and ICBT groups to ensure that dropouts did not differ from completers regarding tinnitus distress (i.e., the THI scores), gender, age, and duration of tinnitus, as this could lead to biased results.

Separate repeated measurement ANOVAs for the GCBT and ICBT treatment groups, with the between subject factor *DF participation* and the WAI-SR scores (i.e., the WAI-SR total scores and the three subscale scores) as repeatedly measured dependent variables (i.e., weeks 2, 5, and 9), were calculated to examine potential effects of participation in the DF on the development of the working alliance in ICBT and GCBT.

Repeated measurement ANOVAs with the between-subject factor group and the within-subject factor time were calculated to detect changes on the WAI-SR in the course of the treatment (within-subject effects of time) and differences between the ICBT and GCBT. We tested the sphericity assumption of the repeated measurement ANOVAs by means of the Mauchly-Test. In the case of a violation of this assumption, we applied the Greenhouse–Geisser correction.

Post-hoc *t*-tests were conducted in order to analyze differences between the two interventions at each assessment point. Bonferroni correction with an adjusted probability of error of  $\alpha = .006$  (i.e., because of nine comparisons stemming from three WAI-SR scales at three assessments) was used to counteract the problem of multiple comparisons. The development of the working alliance and the magnitude of within-group changes were analyzed separately for the first part of the interventions (weeks 2 to 5), the later part of the interventions (weeks 5 to 9) and across the whole interventions (weeks 2 to 9) by calculating Cohen's *d* (with pooled standard deviations) and the corresponding 95% confidence intervals. In this study, positive values of Cohen's *d* indicate an increase of the therapeutic alliance. Hedges' *g* and its 95% confidence interval were calculated to quantify potential differences between the two groups in the development of a working alliance, with positive values indicating a stronger increase of working alliance in the ICBT condition.

To examine the relationship between working alliance and therapy outcome, bivariate correlations were calculated. Treatment outcome was quantified via residual gain scores (RGSs) on the THI. RGSs were calculated to handle measurement error of repeated administration of the instruments and the initial difference between individuals at pre-treatment (Steketee and Chambless, 1992). RGSs were calculated by the formula  $RGS = z_2 - (z_1 * r_{1,2})$ , where  $z_2$  is the standardized post-treatment score,  $z_1$  the standardized pretreatment score, and  $r_{1,2}$  the

Pearson product-moment correlation between raw scores at pre- and post-assessments (Steketee and Chambless, 1992). Thus, the gain of an individual is rescaled relative to typical gains of others who started at the same level of tinnitus distress (Andersson et al., 2008). RGSS were reversed such that positive scores indicate improvement and negative scores deterioration.

### 3. Results

#### 3.1. Participant characteristics

Fig. 1 summarizes the flow of participants through the study. Of the 174 individuals assessed for eligibility, 46 were excluded, leaving a total sample of 128 to be randomized.

All three assessments of working alliance were completed by 38 ICBT participants and by 26 GCBT participants. The male to female gender ratio in the completer sample did not significantly differ from the drop-out sample for both the ICBT group,  $\chi(1) = 0.36, p = .547$ ; and the GCBT group,  $\chi(1) = 0.38, p = .540$ . There were also no significant differences between the completer and drop-out samples in relation to age: GCBT,  $F(1, 63) = 1.08, p = .302$  and ICBT,  $F(1, 61) = 0.07, p = .789$ ; tinnitus duration: ICBT,  $F(1, 61) = 1.84, p = .180$  and GCBT:  $F(1, 63) = 3.90, p = .053$ ; or initial tinnitus distress: ICBT,  $F(1, 58) = 0.33, p = .568$  and GCBT,  $F(1, 59) = 1.02, p = .32$ . The following analyses are based on these complete data sets only.

Demographic data and clinical characteristics of the participants included in the study are presented in Table 1. No significant differences between the two treatment groups were obtained regarding relevant demographic and clinical characteristics or pretreatment level of tinnitus distress ( $ps > .10$ ).

The repeated measurement ANOVAs for the GCBT and ICBT treatment groups, with the between subject factor *DF participation* (i.e., participation in the DF before the ICBT or GCBT treatment), and the WAI-SR scores (i.e., the WAI-SR total scores and the three subscale scores) as the repeatedly measured dependent variables (i.e., weeks 2, 5, and 9) did

not reach significance for any of the scales in any of the analyses (all  $ps > .05$ ).

#### 3.2. Development of working alliance

Repeated measurement ANOVAs over all three times of assessment revealed a significant within-subject effect of time for the WAI-SR total score,  $F(1.54, 95.35) = 50.36, p < .001$ , and the three subscales (i.e., *bond*  $F(1.64, 95.35) = 36.41, p < .001$ , *tasks*  $F(2, 124) = 40.97, p < .001$ , and *goals*  $F(1.54, 95.45) = 34.68, p < .001$ ), indicating a significant increase of the working alliance over the course of therapy.

ANOVAs revealed significant between-subject effects of group for the WAI-SR total score,  $F(1, 62) = 68.78, p < .001$ ; the subscale *bond*,  $F(1, 62) = 83.05, p < .001$ ; *tasks*,  $F(1, 62) = 29.27, p < .001$ ; and *goals*,  $F(1, 62) = 51.99, p < .001$ , indicating significant differences on the overall working alliance ratings between ICBT and GCBT.

Post-hoc *t*-tests showed significantly higher alliance values in GCBT for the WAI-SR total score in: Week 2,  $t(62) = -7.94, p < .001$ ; Week 5,  $t(61.44) = -7.76, p < .001$ ; and Week 9,  $t(62) = -4.03, p < .001$ . There were also significantly higher alliance values in GCBT for the WAI-SR subscale '*tasks*': Week 2,  $t(62) = -4.97, p < .001$ ; Week 5,  $t(62) = -4.57, p < .001$ ; and Week 9,  $t(62) = -4.50, p < .001$ . Significantly higher alliance values in GCBT for the WAI-SR subscale '*goals*' were also found: Week 2,  $t(62) = -6.89, p < .001$ ; Week 5,  $t(53.85) = -6.75, p < .001$ ; and Week 9,  $t(62) = -2.90, p = .005$ . Regarding the subscale *bond*, there were only significant differences in favor of GCBT at Week 2,  $t(62) = -8.49, p < .001$ ; and Week 5,  $t(61.60) = -8.00, p < .001$ , whereas there was no significant difference at Week 9,  $t(58.87) = -2.63, p = .011$ .

The repeated measurement ANOVAs revealed significant time  $\times$  group interactions for the WAI-SR total score,  $F(1.54, 95.35) = 12.13, p < .001$ ; the subscale *bond*,  $F(1.64, 95.35) = 16.41, p < .001$ ; and *goals*,  $F(1.54, 95.35) = 10.22, p < .001$ . This indicates different growth rates of the alliance over the course of time between the two treatments. The only non-significant interaction was for the subscale

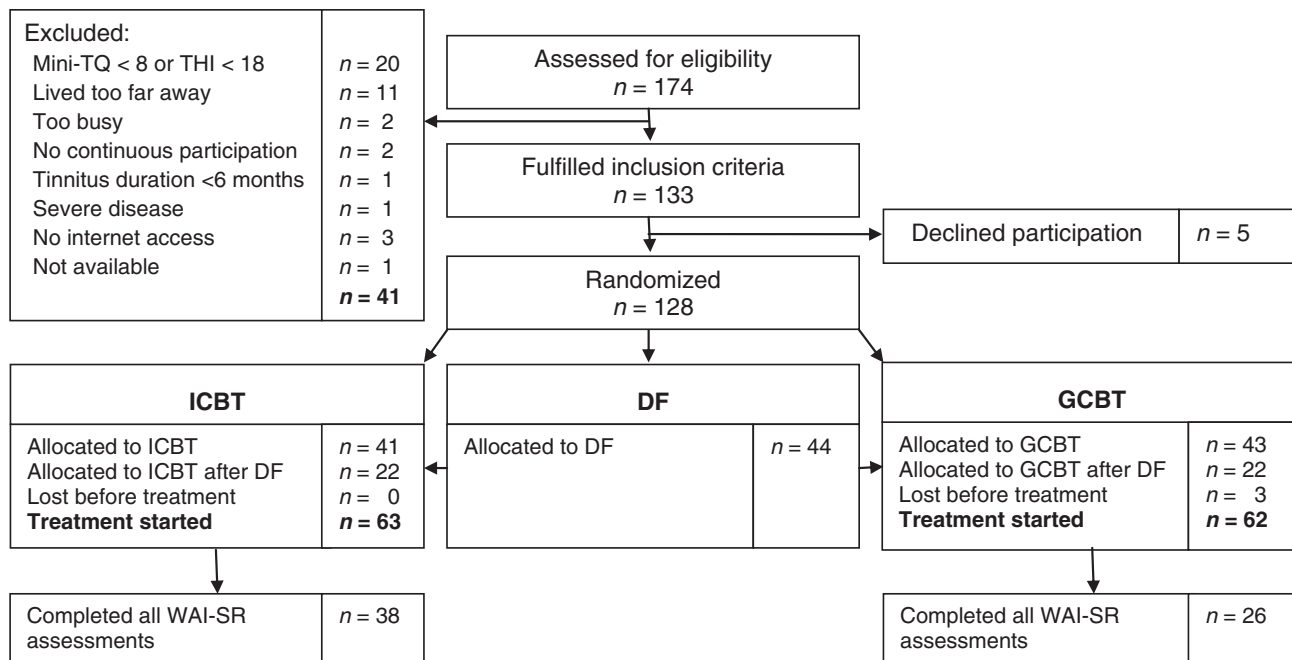


Fig. 1. Flowchart of participants through the study (CONSORT diagram). ICBT = Internet-based cognitive behavior therapy; GCBT = cognitive behavior group therapy; DF = discussion forum.

**Table 1**  
Baseline demographics, clinical characteristics and outcomes by intervention groups.

	ICBT <sup>a</sup> (n = 38)	GCBT <sup>b</sup> (n = 26)	Test statistics
Age (years), M (SD)	51.92 (10.55)	48.96 (12.13)	$F(1, 62) = 1.08, p = .304$
Female, n (%)	15 (39.5)	10 (38.5)	$\chi^2(1, N = 64) = 0.01, p = .935$
Occupational status, n (%)			$\chi^2(1, N = 64) = 0.003, p = .955$
Employed/in training	29 (76.3)	20 (76.8)	
Unemployed, retired	9 (23.7)	6 (23.0)	
Educational status, n (%)			$\chi^2(2, N = 64) = 0.30, p = .862$
Primary or secondary school	14 (36.9)	8 (30.7)	
A-level	6 (15.8)	4 (15.4)	
Academic degree	18 (47.4)	14 (53.8)	
Associated otological conditions: n (%)			
Noise sensitivity	23 (60.5)	17 (65.4)	$\chi^2(1, N = 64) = 0.16, p = .693$
Hearing impairment	28 (73.7)	17 (65.4)	$\chi^2(1, N = 64) = 0.51, p = .475$
Dizziness	15 (39.5)	8 (30.7)	$\chi^2(1, N = 64) = 0.51, p = .476$
Tinnitus duration (years), M (SD)	9.38 (8.03)	6.68 (5.55)	$F(1, 62) = 2.21, p = .142$
Tinnitus distress (THI <sup>c</sup> ), M (SD)	37.68 (14.51)	43.00 (16.81)	$F(1, 62) = 1.82, p = .182$

<sup>a</sup> Internet-based cognitive behavior therapy.

<sup>b</sup> Cognitive behavior group therapy.

<sup>c</sup> Tinnitus Handicap Inventory.

tasks,  $F(2, 124) = 0.20, p = .816$ . Fig. 2 shows the development of the working alliance (WAI-SR total score) in the two treatment groups.

Within-group effect sizes on the WAI-SR between early alliance (week 2) and late alliance (week 9) were large in both intervention groups indicating an increased alliance in Week 9, ICBT:  $1.11 \leq d \leq 1.93$ ; GCBT:  $0.76 \leq d \leq 1.03$ .

A separate analysis for the earlier (weeks 2 to 5) and later (weeks 5 to 9) parts of the interventions revealed differences between ICBT and GCBT on most WAI-SR scales. Concerning ICBT, effect sizes were from small to medium for the first part of the intervention,  $0.03 \leq d \leq 0.51$ , and medium to very high for the second part,  $0.56 \leq d \leq 1.71$ . The GCBT group achieved small to medium effects in both the first part of the therapy,  $0.26 \leq d \leq 0.44$ ; and the second part,  $0.41 \leq d \leq 0.56$  (Table 2).

Concerning the first part of the treatments (weeks 2 to 5), the differences in alliance growth rates between ICBT and GCBT were small for all WAI-SR scales,  $-0.17 \leq g \leq 0.03$ , but indicated a little bit more growth in GCBT (Table 3). Regarding the second treatment part (weeks 5 to 9), and the complete treatment (weeks 2 to 9), the differences were large for most WAI-SR scales,  $1.20 \leq g \leq 1.70$ , with higher growth rates in ICBT. The only exception was the subscale *tasks* with small values (Table 3). These results indicate that the ICBT group with lower rates of alliance in the beginning (see below) partially catch up, especially in the second treatment part, but never reach the level of alliance of

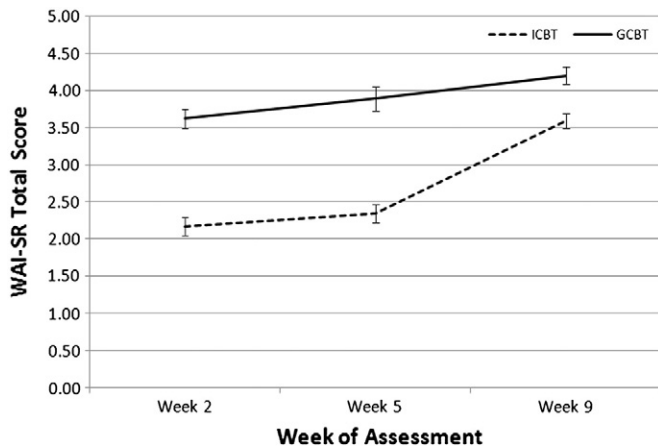
the GCBT. Descriptive data for the WAI-SR, Cohen's *d*, and Hedges' *g* are presented in Tables 2 and 3.

### 3.3. Working alliance and treatment outcome

Table 4 shows the correlations of the WAI-SR scales with the RGSs of the THI as measures of tinnitus distress. Significant correlations between tinnitus outcome and working alliance only emerged at week 5. A significant moderate, positive correlation was found in ICBT between the THI RGSs and the WAI-SR subscale *tasks*,  $r = .40, p < .014$ , and in the GCBT condition between the THI RGSs and the WAI-SR subscale *bond*,  $r = .40, p < .043$ .

## 4. Discussion

This study investigated the working alliance in ICBT in comparison to regular GCBT for chronic tinnitus and its relation to treatment success. High working alliance ratings were found in both groups, which increased over the length of the treatment. However, higher alliance ratings emerged in the GCBT condition across all assessments on most of the WAI-SR scales. Only the difference for the subscale *bond* in week 9 did not reach significance. Significant interaction effects on most WAI-SR scales (except the subscale *task*) indicated different growth patterns in the two conditions. In the GCBT group, the working alliance was already high at the first assessment point (week 2). The increase of the alliance between weeks 2 and 5, and weeks 5 and 9, was similar (except for the scale *bond*), indicating a continuous growth in the GCBT condition. One reason for the lower increase on the scale *bond* from week 5 to 9 could be a ceiling effect, because the score in week 5 ( $M = 4.03, SD = 0.80$ ) was already quite close to the theoretical maximum of the scale (maximum = 5). In the ICBT condition, early alliance ratings were only of low magnitude. The increase rates differed a lot between the first half (weeks 2 to 5) and the second half of the training period (weeks 5 to 9) on most WAI-SR scales, with rather small gains from weeks 2 to 5 ( $0.03 \leq d \leq 0.51$ ), but large gains between weeks 5 and 9 ( $0.56 \leq d \leq 1.71$ ). Due to the large gains in the second half of the training, the alliance ratings in the ICBT condition partially caught up, but still did not reach the level of late alliance in GCBT. Only the subscale *tasks* showed a continuous growth similar to the GCBT condition, which may be attributable to the clear presentation and structuring of the tasks in the ICBT program. As an example, ICBT patients were provided with a clear step by step treatment plan right from the beginning, whereas GCBT patients did not receive such a detailed plan.



**Fig. 2.** WAI-SR composite scores from assessment weeks 2, 5 and 9 (*seldom* = 1, *sometimes* = 2, *fairly often* = 3, *very often* = 4, *always* = 5). Solid line represents GCBT. Dashed line represents ICBT. Error bars represent one standard error.

**Table 2**  
Mean Working Alliance Inventory ratings in the two intervention groups: means, standard deviations, and within-group effect sizes.

Measure and condition	Week 2		Week 5		Week 9		Cohen's <i>d</i> [95% CI]					
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	Weeks 2–5		Weeks 5–9		Weeks 2–9	
<b>WAI-SR<sup>a</sup></b>												
<b>Total</b>												
ICBT <sup>b</sup>	2.17	0.78	2.34	0.98	3.59	0.72	0.19	[−0.26; 0.64]	1.45	[0.90; 2.01]	1.89	[1.27; 2.51]
GCBT <sup>c</sup>	3.62	0.63	3.89	0.61	4.20	0.49	0.44	[−0.12; 0.99]	0.56	[0.00; 1.12]	1.03	[0.42; 1.64]
<b>Bond</b>												
ICBT	1.92	1.07	1.95	1.27	3.84	0.91	0.03	[−0.42; 0.48]	1.71	[1.12; 2.30]	1.93	[1.31; 2.56]
GCBT	3.83	0.73	4.03	0.80	4.30	0.48	0.26	[−0.29; 0.81]	0.41	[−0.15; 0.96]	0.76	[0.18; 1.34]
<b>Tasks</b>												
ICBT	2.32	0.67	2.70	0.78	3.14	0.78	0.51	[0.04; 0.97]	0.56	[0.10; 1.03]	1.11	[0.60; 1.63]
GCBT	3.27	0.85	3.62	0.80	3.98	0.66	0.42	[−0.13; 0.98]	0.49	[−0.07; 1.05]	0.93	[0.33; 1.53]
<b>Goals</b>												
ICBT	2.26	0.95	2.38	1.32	3.79	0.80	0.10	[−0.35; 0.55]	1.29	[0.76; 1.83]	1.74	[1.15; 2.34]
GCBT	3.77	0.71	4.01	0.57	4.32	0.58	0.37	[−0.18; 0.93]	0.54	[−0.02; 1.10]	0.85	[0.26; 1.44]

<sup>a</sup> Working Alliance Inventory – Short Revised.

<sup>b</sup> Internet-based cognitive behavior therapy.

<sup>c</sup> Cognitive behavior group therapy.

The finding of a strong therapeutic alliance in both treatments is in line with previous research (Martin et al., 2000; Horvath et al., 2011a; Horvath et al., 2011b; Horvath and Bedi, 2002; Sucala et al., 2012; Preschl et al., 2011; Bergman Nordgren et al., 2013). However, in previous studies, high alliance ratings for ICBT were already found at mid-treatment, whereas in the current trial this occurred only late in treatment (Andersson et al., 2012; Knaevelsrud and Maercker, 2006; Knaevelsrud and Maercker, 2007; Wagner et al., 2012; Preschl et al., 2011; Bergman Nordgren et al., 2013). Moreover, in contrast to earlier research which found similar alliance ratings in ICBT and face-to-face therapy (Kiropoulos et al., 2008 Dec; Sucala et al., 2012; Preschl et al., 2011; Cook and Doyle, 2002; Reynolds et al., 2006), the current trial showed generally higher ratings in the face-to-face condition. Our finding of significantly higher ratings in the GCBT group might be attributable to variations in the way the treatment contents were provided in the two interventions (i.e., clearly and precisely written self-help texts in ICBT vs. interactive elaboration in GCBT). A further explanation could be the different mode of application of the WAI-SR (paper–pencil in GCBT vs. online in ICBT). Because only the Internet-based version in ICBT featured a forced choice response format, more ‘missings’ were observed in the GCBT. Moreover, in GCBT the group participants completed the WAI-SR directly after the sessions and then handed it over to the therapist in person. Despite the use of study codes instead of clear names and the collection of each questionnaire in an anonymous envelope, the presence of the therapist might have led to response tendencies due to social desirability, with an overestimation of the alliance in the GCBT condition. However, there is some evidence that alliance scores are not distorted due to the presence of a therapist or knowing that the scores would be observed by the therapist (Reese et al., 2013).

The finding of different growth curves for the two conditions is in line with previous research that has also shown varying alliance patterns for different kinds of treatments (Horvath et al., 2011a). Despite comparable levels of the weekly time spent by the therapist per patient in both treatment conditions (ICBT: 13.76 min; GCBT: 11.22 min), the development of the working alliance in GCBT may have profited from the interactions between the therapist and the other group members, or even the mere presence of the therapist for at least 90 min a week. This could explain our finding that the ICBT participants needed more time (i.e., weeks of treatment) to develop a strong therapeutic relation. Indeed, a few ICBT participants stated that they had difficulties answering the WAI-SR because they had too little information about the therapist, especially at the beginning of the intervention. However, Anderson et al. (2012) outlined that the Working Alliance Inventory (WAI) focuses on concrete aspects of the whole therapy (tasks, goals, bond) and not simply on the immediate contact with the therapist. The therapist might be present as author of the self-help texts and alliance-fostering aspects may also be included in these texts (Andersson et al., 2012; Richardson et al., 2010).

The second aim of the current study was to investigate the association between alliance and treatment outcome. Significant correlations emerged between working alliance and the THI RGS at mid-treatment (week 5). Here, the improvements in tinnitus distress were related to the agreement on the therapeutic tasks in ICBT ( $r = .40$ ,  $p = .014$ ) and to the affective bond in GCBT ( $r = .40$ ,  $p = .043$ ). Both correlations were moderate, which is line with previous research, where a modest association between alliance and outcome was found (Martin et al., 2000; Horvath et al., 2011a; Horvath et al., 2011b; Horvath and Bedi, 2002). The fact that the correlations between working alliance and tinnitus outcome reached significance for the THI RGS has important

**Table 3**  
Test statistics of repeated measurement ANOVAs and between group effect sizes (Hedges' *g*).

Scales	Within-subject effect of time	Between-subject effect of group	Interaction time × group	Hedges' <i>g</i> [95% CI] <sup>b</sup>					
				Weeks 2–5		Weeks 5–9		Weeks 2–9	
<b>WAI-SR<sup>a</sup></b>									
Total	$F(1.54, 95.35) = 50.36$ , $p < .001$	$F(1, 62) = 68.78$ , $p < .001$	$F(1.54, 95.35) = 12.13$ , $p < .001$	−0.13	[−0.63; 0.37]	1.25	[0.71; 1.79]	1.22	[0.68; 1.76]
Bond	$F(1.64, 95.35) = 36.41$ , $p < .001$	$F(1, 62) = 83.05$ , $p < .001$	$F(1.64, 95.35) = 16.41$ , $p < .001$	−0.17	[−0.66; 0.33]	1.70	[1.12; 2.28]	1.66	[1.09; 2.24]
Tasks	$F(2, 124) = 40.97$ , $p < .001$	$F(1, 62) = 29.27$ , $p < .001$	$F(2, 124) = 0.20$ , $p = .816$	0.03	[−0.47; 0.52]	0.11	[−0.39; 0.60]	0.13	[−0.37; 0.63]
Goals	$F(1.54, 95.35) = 34.68$ , $p < .001$	$F(1, 62) = 51.99$ , $p < .001$	$F(1.54, 95.35) = 10.22$ , $p < .001$	−0.12	[−0.62; 0.38]	1.20	[0.66; 1.74]	1.22	[0.68; 1.76]

<sup>a</sup> Working Alliance Inventory – Short Revised.

<sup>b</sup> Positive/negative values of Hedges' *g* indicate a higher/lower amount of increase of working alliance in the Internet-based cognitive behavior therapy in comparison to the cognitive behavior group therapy. Whenever the Mauchly Test indicated a violation of sphericity ( $p < .05$ ), a correction of the DFs according to Greenhouse–Geisser was applied.

**Table 4**

Pearson correlation coefficients between mean Working Alliance Inventory ratings and residual gain scores of tinnitus distress in ICBT<sup>a</sup> (n = 38) and GCBT<sup>b</sup> (n = 26).

Scales	THI <sup>c</sup> RGS <sup>d</sup>	
	ICBT r (p)	GCBT r (p)
WAI-SR <sup>e</sup> Week 2		
Total	.26 (.112)	.26 (.200)
Bond	.19 (.258)	.37 (.063)
Tasks	.30 (.069)	.31 (.125)
Goals	.22 (.182)	-.06 (.778)
WAI-SR Week 5		
Total	.22 (.177)	.22 (.285)
Bond	.08 (.641)	.40* (.043)
Tasks	.40* (.014)	.01 (.953)
Goals	.19 (.256)	.10 (.637)
WAI-SR Week 9		
Total	.24 (.152)	-.15 (.479)
Bond	.24 (.156)	-.14 (.492)
Tasks	.25 (.136)	-.18 (.372)
Goals	.13 (.427)	-.05 (.825)

<sup>a</sup> Internet-based cognitive behavior therapy.

<sup>b</sup> Cognitive behavior group therapy.

<sup>c</sup> Tinnitus Handicap Inventory.

<sup>d</sup> Residual gain score.

<sup>e</sup> Working alliance inventory – Short Revised.

\* p < .05.

implications. The THI RGSs depict the amount of improvement which cannot be explained by the tinnitus distress at the beginning. Thus, the working alliance could be one of the reasons for individual improvement, apart from the initial distress level, which makes it a particularly important predictor of therapy outcome. However, in the current trial significant correlations were only found for the assessment at week 5 and for specific subscales. Some aspects of the study design might explain why we did not find further significant correlations between outcome and working alliance. Maybe the relations between working alliance and treatment outcome were too small to be detectable given our sample size. A lack of variance in treatment effects or working alliance ratings could also be an explanation. Research on the working alliance suggests that WAI-SR ratings are more likely to be related to general improvement scores than to the rather symptom-specific measures (e.g., THI) that we applied in this study (Busseri and Tyler, 2003).

The finding of significant correlations on different subscales in the two treatments suggests that different aspects of the working alliance might be crucial for treatment success in ICBT and GCBT. It is not surprising that the personal affective bond between therapist and patient might play an important role in face-to-face therapy. In highly structured ICBT, the agreement on the therapeutic tasks might be the most important factor of treatment success, as the basic idea of the therapeutic guidance is to encourage the client to work on the therapeutic tasks.

Some general methodological limitations need to be addressed. First, the characteristics of the two samples (i.e., ICBT, GCBT) limit the generalizability of the study results. The inclusion of the waiting list participants in the data analysis for the 'pure' ICBT and GCBT clients is questionable, because the active control condition might have had an effect of its own on therapeutic outcome or WAI-SR ratings. However, statistical analyses indicated no significant effects of the DF on tinnitus distress (Jasper et al., 2014) or on alliance ratings. We therefore decided to include the DF participants in order to gain a larger sample set for the current analyses, but the sample size remained small due to a lot of missing values. More 'missings' were observed in the GCBT group than in the ICBT group. The high number of missings and the differential attrition rates in the two groups might have biased the study results and limited the generalizability of our findings. Dropout analyses revealed no significant differences between completers and non-completers regarding tinnitus distress, tinnitus duration, age and gender. However, future research should place an emphasis on larger sample sizes and

on trying to avoid missing data. One step in this direction could be application of online measures only (i.e., irrespective of the therapy setting) to avoid missing data on an item level.

Second, the particular assessment instruments used in the current trial limit the generalizability of the study results. The WAI-SR was originally developed for assessment of the working alliance in the context of face-to-face therapy. As Andersson et al. (2012) outlined earlier, it is not clear whether the adaptations of the WAI-SR were sufficient and whether the questionnaire is suitable to assess the working alliance in an Internet context. However, the theoretical foundation of the WAI-SR in Bordin's (1979; 1994) pantheoretic conception of the working alliance may justify the use of the scale across different psychotherapeutic contexts (Wilmers et al., 2008). Moreover, the Working Alliance Inventory (Horvath and Greenberg, 1986; Horvath and Greenberg, 1989) is the most widely used measure in face-to-face psychotherapy research, with the WAI-SR being a recently refined version with good psychometric properties (Wilmers et al., 2008). Thus, the focus of this study on the comparison of ICBT with face-to-face CBT suggests using the WAI-SR. Nevertheless, future research should examine the construct validity of the WAI-SR in the Internet setting and the measurement invariance (i.e., Internet vs. paper-pencil version) of the WAI-SR. Another limitation in terms of our measures is the sole reliance on self-report data. As tinnitus is a complex phenomenon, some aspects (e.g. treatment history, associated hearing problems) are possibly better accessible via expert ratings (e.g., medical/psychological professionals). A combination of self-report data with clinician ratings, as with the structural tinnitus interview (Hiller and Goebel, 1999; Hiller et al., 1999) for example, would probably have been more appropriate to meet the complexity of the tinnitus phenomenon (Hiller and Goebel, 1999; Landgrebe et al., 2012). In addition, application of the therapist version of the WAI-SR might have provided interesting data. Although earlier research has suggested that client ratings of the working alliance are more predictive than therapist ratings (Krupnick et al., 1996), assessment of the therapist's perspective might contribute to a better understanding of the working alliance in an Internet setting and is therefore an interesting issue for future research.

A third possible limitation is that comparability of the two CBT conditions is questionable. ICBT and GCBT differ in their treatment setting (i.e., Internet vs. face-to-face) and treatment format (i.e. individual vs. group). Differences in the WAI-SR might be a function of the treatment format because individual and group therapy are different forms of therapy that vary in their treatment focus. In group therapies, the interpersonal and interactional processes are seen as key aspects of the therapy, whereas in individual therapy intrapsychic aspects are focused upon (Kivlighan and Kivlighan, 2004; Holmes and Kivlighan, 2000). However, both forms of therapy have been found to be of equal effectiveness (Hesser et al., 2011; McRoberts et al., 1998), and the working alliance plays a crucial role in both treatment formats (Horvath et al., 2011a). Moreover, the ICBT and the GCBT in the current study were based on different treatment manuals. On the other hand, the intention of the current study was to compare the working alliance in a standard face-to-face setting with a standard ICBT treatment. This speaks for the high external validity of the study results, but may come at the expense of a somewhat lower internal validity.

Another limitation addresses our measures of treatment adherence. In the GCBT no formal measures of the therapist's adherence to protocol (i.e., video monitoring) were taken. Concerning the client perspective, only the number of attended treatment modules and sessions was assessed. This gives no information about the extent of training that the patients actually did and how much time a client devoted to the therapist, especially in the ICBT. Future studies should involve more sophisticated measures of adherence, in order to gain information about what the patient actually does in ICBT and how much time he devotes to the therapist, the treatment system, and to the exercises.

In line with earlier research, strong alliance ratings were found in both conditions (i.e., ICBT, GCBT) but more time might be needed to develop a high working alliance in ICBT. In addition, specific correlational

patterns between the WAI-SR subscales and the therapy outcomes across GCBT and ICBT might indicate that different aspects of the therapeutic alliance could be important for treatment success in ICBT and GCBT ('bond' in GCBT versus 'tasks' in ICBT). A possible consequence of these findings might be that therapists need to focus on other aspects of the alliance in ICBT and in GCBT to enhance the positive effects and the efficacy of a treatment. This could mean that the creation of a good therapeutic bond should be fostered in GCBT (e.g., by the expression of empathy towards the clients), whereas the explanation and configuration of the therapeutic tasks should be targeted in ICBT. In order to prepare therapists to handle the varying requirements regarding the therapeutic alliance across different therapeutic settings (e.g., Internet versus group therapy), one could offer specific training to the therapists. Given the potential of ICBT to facilitate access to psychotherapy in clinical practice, it is a very important issue to deepen our understanding of the underlying mechanisms.

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