



# ACT Internet-based vs face-to-face? A randomized controlled trial of two ways to deliver Acceptance and Commitment Therapy for depressive symptoms: An 18-month follow-up



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## ABSTRACT

The aim of the present study was to investigate two interventions based on Acceptance and Commitment Therapy (ACT) for depressive symptoms: A face-to-face treatment (ACT group) was compared to a guided self-help treatment delivered via the Internet consisting of two assessment sessions (pre and post) and an ACT-based Internet program (iACT). Outpatients experiencing at least mild depressive symptoms were randomized to either approach. The iACT treatment group received access to an ACT-based Internet program and supportive web-based contact over a period of 6 weeks. The face-to-face group received ACT-based treatment once a week over the same period of time. In both groups, the results showed a significant effect on depression symptomatology, and general wellbeing after treatment and at the 18-month follow-up. However, the data indicated that the iACT group changed differently regarding depressive symptoms and wellbeing as compared to the face-to-face ACT group. Results showed large pre-treatment to 18-month follow-up within-group effect sizes for all symptom measures in the iACT treatment group (1.59–2.08), and for most outcome measures in the face-to-face ACT group (1.12–1.37). This non-inferiority study provides evidence that guided Internet-delivered ACT intervention can be as effective as ACT-based face-to-face treatment for outpatients reporting depressive symptoms, and it may offer some advantages over a face-to-face intervention.

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## Introduction

Depression is one of the most common mental illnesses affecting 350 million people worldwide (WHO, 2012). In Western countries, depression may affect half of the population during their lifetime (Andrews, Poulton, & Skoog, 2005). Considering the significant economic costs and human suffering due to depression, it is important to improve access to psychological treatments and develop new, flexible and cost-effective therapies for those suffering from depression (e.g. Richards & Bower, 2011).

The ever-increasing use of Internet has created new opportunities to receive evidence-based psychological treatment. Internet-based interventions have been developed and tested for a wide range of health problems (Cuijpers, van Straten, & Andersson, 2008). Further, there are several protocols developed for depression and depressive symptoms (e.g. Andersson, 2006; Andersson

et al., 2005; Christensen, Griffiths, & Jorm, 2004; Meyer et al., 2009; Van Straten, Cuijpers, & Smits, 2008; Vernmark et al., 2010).

Internet-delivered treatments differ in regard to the amount of therapist contact provided. Glasgow and Rosen (1978) have developed a taxonomy to classify the nature and type of support provided for CBT self-help. It distinguishes between three types of support: *self-administered* in which no support is provided; *minimal contact* in which a rationale with regular check-ins is provided; and *guided self-help* in which the clients receive an initial support session, a rationale and support sessions throughout the treatment program (see also Andersson, 2009). We know from previous research that treatments with therapist support are more effective than treatments without any therapist contact (e.g. Andersson & Cuijpers, 2009; Farrand & Woodford, 2013; Spek, Cuijpers, et al., 2007). Meta-analyses and reviews comparing untreated control conditions with Internet-based and other computerized treatments indicate effect sizes between  $d = 0.42$  and  $0.78$  in favor of *guided* computerized and Internet-based treatments in which a therapist or a coach supports the client through the treatment program

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(Andersson & Cuijpers, 2009; Griffiths, Farrer, & Christensen, 2010; Richards & Richardson, 2012). Self-administered or self-guided psychological treatments for depression without therapist support have shown lower effect sizes ( $d = 0.25–0.36$ ; Andersson & Cuijpers, 2009; Cuijpers et al., 2011; Richards & Richardson, 2012). Meta-analysis comparing guided Internet-based interventions with face-to-face therapies for depression and anxiety indicated that both treatments were equally effective, with effect sizes varying from 0.02 to 0.09 (Andrews, Cuijpers, Craske, McEvoy, & Titov, 2010; Cuijpers, Donker, van Straten, Li, & Andersson, 2010).

Acceptance and Commitment Therapy is one of the third waves of behavioral therapies (Hayes, Strosahl & Wilson, 1999). Several studies and meta-analyses support its effectiveness across a range of psychological problems, including chronic pain, depression and anxiety disorders, substance abuse, smoking, psychosis, and workplace stress (Hayes, Luoma, Bond, Masuda, & Lillis, 2006; Powers, Zum Vörde Sive Vörding, & Emmelkamp, 2009; Ruiz, 2010). Available research offers limited evidence in support of ACT for treating depression and depressive symptoms. Nevertheless, reported studies indicate that ACT is effective in reducing depressive symptoms (Bohlmeijer, Fledderus, Rokx, & Pieterse,

2011; Powers et al., 2009), and might have an equal impact on depression when compared with traditional cognitive-behavioral treatments (Forman, Herbert, Moitra, Yeomans, & Geller, 2007; Lappalainen et al., 2007; Zettle & Rains, 1989). A recent study where ACT was compared with Cognitive Therapy for treating depression reported that long-term treatment outcomes were slightly better maintained in the CT condition (Forman et al., 2012). Nevertheless, ACT is considered as an empirically supported treatment with modest effect on managing depression (American Psychological Association).

A number of self-help ACT-based treatments have been studied. Promising results have been found for bibliotherapy for chronic pain (Johnston, Foster, Shennan, Starkey, & Johnson, 2010), depression (Fledderus, Bohlmeijer, Pieterse, & Schreurs, 2012), Japanese students adjusting to university life in the United States (Muto, Hayes, & Jeffcoat, 2011), school teachers and other personnel (Jeffcoat & Hayes, 2012), and for guided Internet-delivered ACT for tinnitus distress (Hesser et al., 2012), and chronic pain (Buhrman et al., 2013). A brief telephone-based ACT intervention for smoking cessation has shown encouraging results (Bricker, Mann, Marek, Liu, & Peterson, 2010; Schimmel-Bristow,

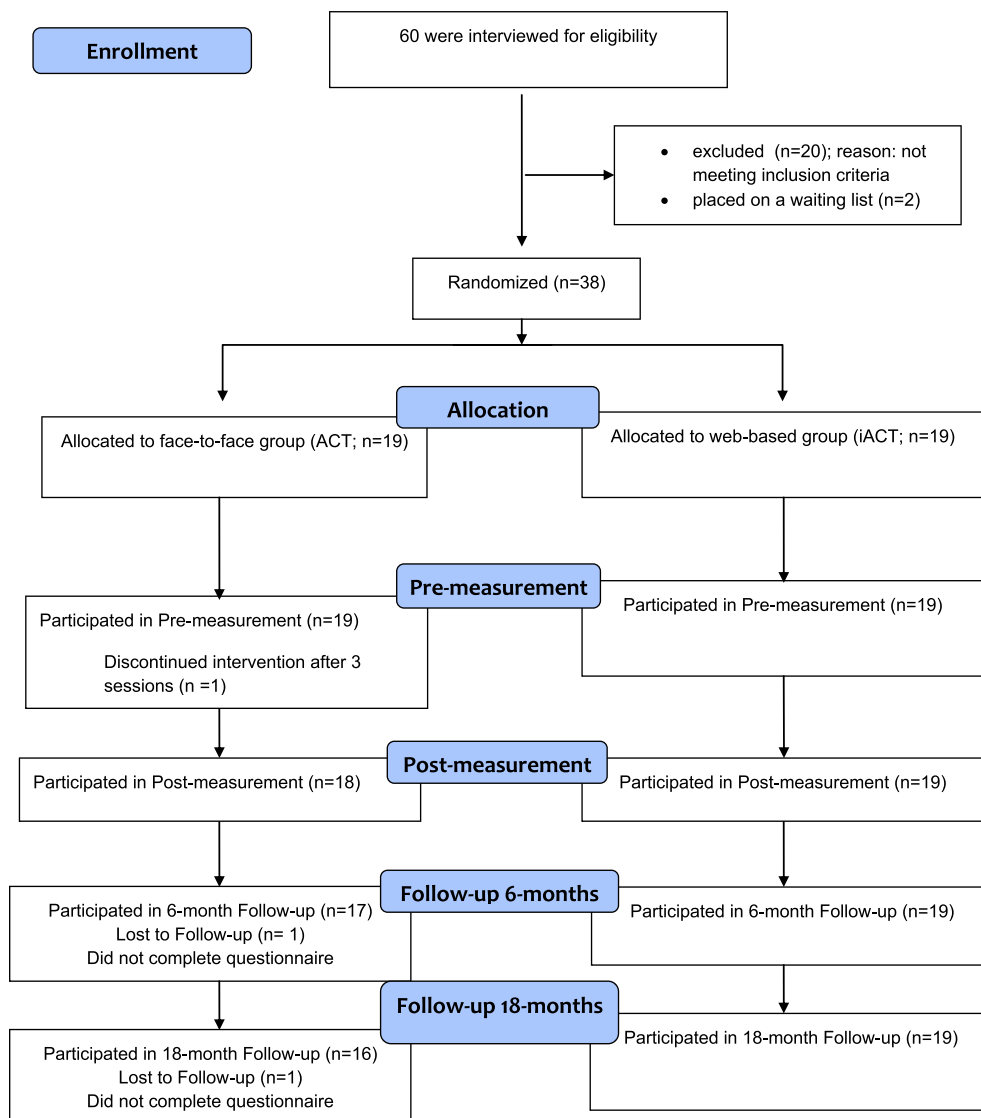


Fig. 1. Flow chart of the study design.

Bricker, & Comstock, 2012), and an Internet-delivered ACT-based intervention for smoking cessation is under development (Heffner, Wyszynski, Comstock, Mercer, & Bricker, 2013). While these studies provide some support for the idea that Internet-based ACT interventions might be successful, we do not know of any published Internet-based depression studies with long-term follow-up data that purely focuses on ACT.

According to Andersson and Cuijpers (2009), there is a need to further test whether Internet-delivered treatment can be as effective as face-to-face treatments in depression. Identifying the gap, we decided to compare the effects of two short ACT-based interventions for the treatment of depressive symptoms delivered by student therapists: a six week face-to-face treatment (ACT) and a guided six week Internet-based treatment including two face-to-face assessment sessions (iACT). The support provided in the iACT group in this study can be characterized as *guided self-help* (Glasgow & Rosen, 1978). Both interventions were meant for out-patients who were experiencing at least mild depression as assessed by a telephone-based screening. The main objective of this study was to compare the effects of two parallel treatment groups. Both treatments were administered by the same therapist. We anticipated that both ACT-interventions would have similar effects in reducing depressive symptoms and psychological distress. Thus, the trial could be called as a non-inferiority trial that sought to determine whether the guided Internet-based ACT treatment (iACT) was as effective as the ACT-based face-to-face treatment (ACT).

## Method

### Participants

Participants were recruited through an advertisement in a local newspaper in Jyväskylä, Finland. The advertisement explained that it was a university research project with an aim to investigate new psychotherapeutic methods in treating individuals who felt depressed. In response to the advertisement, 60 prospective participants contacted the clinic through email and telephone during the given time window (February 21–23, 2011), and were screened over the telephone using a structured interviews. The most important eligibility criteria, depressive symptoms, were assessed using the following three questions (translated here from Finnish): 1. Have you felt sad, low, depressed, or irritable for several days without realizing why? 2. Have you had periods when you have not been interested in things that usually bring you joy? 3. Have you had periods of several days or longer when you were so depressed that nothing could cheer you up? To be included in the study, the prospective participants had to answer “yes” to all three questions. Additional inclusion criteria were: no simultaneous treatment of depression or other psychological problems, at least 18 years of age, basic computer skills and access to Internet at home.

Of the 60 people who contacted the clinic, 20 were excluded because either they did not meet the inclusion criteria or would not have been able to commit to the entire program. 40 participants met the inclusion criteria and were matched on gender and randomly assigned to either Internet-based (iACT) or face-to-face group (ACT). We were able to offer treatment for 38 participants, so the 38 were selected in the order they had signed in, leaving another two people out of the treatment. On client from each group was randomly selected to each therapist. Two therapists selected randomly three clients. One client dropped out from the face-to-face group (ACT) after the third meeting because she reported not needing treatment any longer. The study sample size consisted of

38 participants ( $N = 38$ ), half ( $n = 19$ ) of which were allocated to face-to-face group (ACT) and the remaining half ( $n = 19$ ) were assigned to the iACT group. Fig. 1 depicts the flow of participants. The Ethical Committee of Jyväskylä University approved the study protocol.

Basic demographic information was collected through a questionnaire at the beginning of the study for both groups. Table 1 exhibits participants' characteristics. Of the 38 participants, majority (68.4%) were women. The mean age of participants was 44.61 years ( $SD = 14.28$ ). About half (47.4%) of the participants reported having university education. In total, 20 (52.6%) participants reported having a psychiatric diagnosis according to the background questionnaire. Among those, 15 (40.5%) participants had depression diagnosis, three participants (8.1%) had depression and other psychiatric diagnosis, and two participants (5.4%) had some other psychiatric diagnosis without depression. 21 participants (56.8%) had previously used antidepressants, and 13 (34.2%) were on depression medication during the study. At 18-month follow-up, 8 participants reported being on anti-depressant medication ( $n = 34$ ; iACT,  $n = 5$ ; ACT,  $n = 3$ ). There were no significant differences between the groups in terms of basic demographic information, nor change of medication during the study period.

Depressive symptoms were assessed at three points prior to the actual intervention, i.e. at the screening interview over the phone using three questions concerning depression, at pre-measurement using the Beck's Depression Inventory (BDI-II), and at the baseline interview using the DSM-IV criteria for depressive disorder. According to the BDI-II at pre-measurement, the mean for depressive symptoms for all participants ( $n = 38$ ) was 21.95 ( $SD = 7.98$ ; min 9, max 40). Table 1 illustrates number of participants with mild, moderate or severe depression based on the BDI-II pre-measurement. According to the baseline interviews based on the DSM-IV criteria, 11 participants (57.9%) in each group met the DSM-IV criteria for depression. The average number of depressive symptoms was 4.63 ( $SD = 1.21$ ) symptoms in the iACT group and 5.16 ( $SD = 1.92$ ) in the ACT group. The difference between the groups was not significant.

### Therapists

Psychotherapy training was given to master's level students in Psychology, which was part of their psychotherapy training course. The mean age of the student therapists ( $n = 18$ ) was 26.2 years ( $SD = 4.18$ ; range 21–34), and all except one were females ( $n = 17$ ). The students had studied psychology for almost four years. All student therapists received 13 h of training in ACT. The training included lectures on the general principles of ACT, as well as the presentation and practice of a Functional Analytic Clinical Case Model, FACCMM (Haynes & O'Brien, 2000; Haynes, O'Brien, & Kaholokula, 2011). The FACCMM is a vector-graphic approach to functional analysis. Additionally, the students had to read a Finnish ACT-book written for therapists (Lappalainen et al., 2004), as well as the Finnish translation of the ACT self-help book *Get Out of Your Mind Into Your Life* (Hayes & Smith, 2008). Concurrent with treatment, student therapists received weekly supervision in groups, totally 18 h (6 weeks  $\times$  3 hours). The supervisor was an experienced clinician, licensed psychologist and psychotherapist with almost 30 years of clinical experience, supervision, and 12 years experience of ACT in clinical setting. The treatment sessions were neither recorded nor audiotaped, so the main part of the supervision was focused on how to apply ACT techniques individually while carrying out the treatment.

**Table 1**  
Participant characteristics.

Baseline characteristics	All (n = 38)	iACT (n = 19)	ACT (n = 19)
Age M (SD)	44.61 (14.28)	42.26 (16.04)	46.95 (12.27)
Gender			
Female	26 (68.4%)	13 (68.4%)	13 (68.4%)
Men	12 (31.6%)	6 (31.6%)	6 (31.6%)
Marital status			
Single	12 (31.6%)	7 (36.8%)	5 (26.3%)
Married or living together	17 (44.7%)	8 (42.1%)	9 (47.4%)
Divorced	5 (13.2%)	0 (0.0%)	5 (26.3%)
Widowed	1 (2.6%)	1 (5.3%)	0 (0.0%)
Other	3 (7.9%)	3 (15.8%)	0 (0.0%)
Education <sup>a</sup>			
Low	4 (10.5%)	3 (15.8%)	1 (5.3%)
Middle	16 (42.1%)	7 (36.8%)	9 (47.3%)
High	18 (47.4%)	9 (47.4%)	9 (47.4%)
Employment			
Employed <sup>b</sup>	15 (39.5%)	5 (26.3%)	10 (52.6%)
Student	5 (13.2%)	4 (21.1%)	1 (5.3%)
Unemployed	5 (13.2%)	3 (15.8%)	2 (10.5%)
Retired	7 (18.4%)	3 (15.8%)	4 (21.1%)
Other <sup>c</sup>	6 (15.7%)	4 (21.0%)	2 (10.5%)
Depression diagnosis	18 (47.4%)	10 (52.6%)	8 (42.1%)
Depression <sup>d</sup>			
Minimal	6 (15.7%)	4 (21.1%)	2 (10.5%)
Mild	8 (21.1%)	5 (26.3%)	3 (15.8%)
Moderate	16 (42.1%)	6 (31.5%)	10 (52.6%)
Severe	8 (21.1%)	4 (21.1%)	4 (21.1%)
Earlier treatment	21 (55.3%)	8 (42.1%)	13 (68.4%)
Medication <sup>e</sup>	13 (34.2%)	7 (36.8%)	6 (31.6%)

<sup>a</sup> Low < 9 years of education, middle < 12 years of education, high > 12 years of education.

<sup>b</sup> Full time, part time and entrepreneurs.

<sup>c</sup> The group *Others* (6; 15.7%) included those being on sick leave, homemakers, or other choosing this option.

<sup>d</sup> Depression scores according to BDI-II: 0–13 minimal, 14–19 mild, 20–28 moderate, 29–63 severe.

<sup>e</sup> Use of antidepressants and/or hypnotics.

## Measures

Participants were assessed at the beginning of the intervention (pre-measurement), at the end of the intervention (post-measurement; seven weeks from the first session), at six-months after the post-measurement (follow-up 1), and finally 18-month after the post-measurement (follow-up 2). In both conditions, participants received the assessment package by regular post, filled them out at home, and brought them to the first session (pre-measurement). Participants in the iACT group filled the assessment packages at home prior to the post-measurement. However, the participants in the ACT group completed assessment procedure after the last session (post-measurement). At 6-month and 18-month follow-ups the questionnaires were again sent to the participants by regular post. At the post-measurement and 6-month follow-up, all participants were interviewed for a satisfaction survey in which their perceptions and experiences of treatment were investigated. An independent evaluator performed the structured follow-up interview and student therapists were not involved in the process. At 18-month follow-up, the participants received and returned the inventories by regular post.

## Symptom measures

Depression was measured by the Beck Depression Inventory (BDI-II); (Beck, Steer, & Brown, 2004), which contains 21 questions about depressive symptoms and their severity. The scale ranges from 0 to 63 (0–13 indicates no or very few depressive symptoms, 14 to 19 indicates mild depression, 20 to 28 moderate depression, and 29 to 63 severe depression). The BDI-II has good reliability and

validity in both nonclinical and clinical populations and has shown high internal consistency (Cronbach's alpha  $\alpha = 0.92$ ; Segal, Coolidge, Cahill, & O'Riley, 2008).

Symptom Checklist 90 (SCL-90; Holi, Sammallahti, & Ahlberg, 1998) was used to measure psychopathological symptoms, which is a self-report checklist with 90 questions on a scale of 0 (none) to 4 (very much). The SCL-90 is a self-report symptom inventory designed to measure the status of current psychological symptoms. Each item of the questionnaire is rated on a five-point scale of distress from 0 (none) to 4 (extreme). The SCL-90 has been validated for the Finnish population. In a Finnish community sample ( $n = 337$ ; Holi et al., 1998), the mean GSI was 0.60 ( $SD = 0.44$ ).

Psychological distress was measured by General Health Questionnaire (GHQ-12), which consists of 12 statements about mental well-being (Goldberg et al., 1997). The GHQ-12 form rating varies depending on the purpose. In this study, the four-step Likert scale (0–3) was used, for it has been recommended to be better than the dichotomous scale for statistical research purposes (Pennikilampi-Kerola, Miettinen, & Ebeling, 2006), and because population comparison data from normal Finnish populations is available (Holi, Marttunen, & Aalberg, 2003). The internal consistency has been reported to be high (Cronbach's alpha  $\alpha = 0.94$ ; Holi et al., 2003).

Finnish Descriptive Visual Rating scale (Ojanen, 2001) was used to measure life satisfaction because they have shown to have good test-retest reliability (Sjögren et al., 2005). The participants were asked to rate on a scale of 0–100 (0 = very dissatisfied, 100 = very satisfied) how satisfied they were with their lives during the previous month.

## Flexibility, mindfulness and thought suppression measures

Psychological flexibility was measured by the Finnish version of the Acceptance and Action Questionnaire (AAQ-II; Bond et al., 2011) that measures experiential avoidance (EA). AAQ-II is a shorter version of the AAQ-16 (Bond & Bunce, 2003; Hayes, Strosahl, Bunting, Twohig, & Wilson, 2004) with ten questions to be answered on a scale of 1 (never true) to 7 (always true) participant's willingness to be in contact with negative private events, acceptance of these events, and whether they can live in accordance with their values. Summation of the scores results in a total mark ranging from 10 to 70, whereby a higher score indicates means a higher level of psychological flexibility, e.g. higher acceptance and less EA. The AAQ-II has been reduced to a 7-item scale in 2011 with the Cronbach's alpha  $\alpha = 0.84$  (Bond et al., 2011). The 7- and 10-item versions correlate at  $r = 0.96$  and thus the earlier version of AAQ-II used in this study should be valid for research purposes (Bond et al., 2011).

KIMS (Kentucky Inventory of Mindfulness Skills; Baer, Smith, & Allen, 2004) was used to measure mindfulness, which is a self-report inventory for the assessment of mindfulness skills. Four mindfulness skills are specified: observing, describing, acting with awareness, and accepting without judgment. KIMS includes 39 statements to be answered on a scale of 1–5.

White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994) was utilized to measure thought suppression. The WBSI is a 15-item questionnaire that is designed to measure thought suppression. Chronic thoughts suppression is related to obsessive thinking and negative affect associated with depression and anxiety. The scoring of the WBSI is based on a 5 point scale from Strongly disagree (1) to Strongly agree (5). The total score (range from 15 to 75) is obtained by summing up the responses that are provided by respondents. Higher scores on the WBSI indicate greater tendencies to suppress thoughts.



The Automatic Thoughts Questionnaire (ATQ; [Hollon & Kendall, 1980](#)) measures depressogenic thought frequency. The ATQ-B is a revision to this measure by Jacobson and colleagues (ATQ-B; [Addis & Jacobson, 1996](#)) aimed at assessing the believability of the depressive thoughts if and when they occur. ATQ-F measures the frequency of automatic/depressive thoughts whereas ATQ-B gauges the believability of (or fusion with) such thoughts.

#### *Measurement of motivation and client satisfaction*

In addition to the standardized instruments, data on participant motivation and satisfaction were collected. Using a Visual Analogue scale (VAS), 1 to 10 (1 = not at all ready, 10 = completely willing), the participants in both conditions were asked to evaluate their willingness to make changes in their lives. The readiness for a change in the iACT group was 8.22 ( $SD = 1.40$ ) and in the ACT group 8.00 ( $SD = 1.71$ ). After the treatment period, at 6- and 18-month follow-up, client satisfaction was measured using 1–10 Visual Rating scales (1 = not at all satisfied with the treatment, 10 = very satisfied with the treatment). On a scale from 1 to 10 (1 = would not recommend at all, 10 = would recommend very much), the participants were also asked if they would recommend this kind of treatment to others. At 18-month follow-up, they were asked whether or not (Yes or No) they would recommend the treatment to others.

#### *The Internet-based treatment (iACT)*

The Internet program was used with the guidance of student therapists. Participants met their therapist twice i.e. at the beginning and at the end of the treatment. The intervention started with a face-to-face assessment session consisting of 60-min interviews per participant. The aim of the initial session was to obtain information about the participant's current situation, concerns, and relevant history. Finally, the participant was briefly guided to use the program named *The Good Life Compass*.

After the first session the participants were sent e-mail with login details including user name and a password so that they could access the *Good Life Compass* at home. Based on the problem list constructed during the first session, the therapist developed a functional analysis clinical case model (FACCM; [Haynes et al., 2011](#); [Haynes & O'Brien, 2000](#)) showing, in graphical form, how the problematic issues were related to each other. The individual case formulation model was sent by regular post to the client. In line with the core processes of ACT, the Internet-based intervention consisted of six modules, and each week's module was allocated to one of the processes. The first week's theme was *Creative hopelessness and Values*. The second week focused on *Value-based actions*, the third week targeted *Contact with the Present moment*, the fourth week dealt with *Cognitive Defusion*, the fifth week's theme was *Self as context*, and finally the last week's theme was *Acceptance*.

*The Good Life Compass* primarily consisted of text, pictures and audio-based self-help material: information about depression, a weekly self-help text and experiential exercises (metaphors, mindfulness exercises) highlighting the core process of the week, and homework assignments related to it. The experiential exercises were downloadable in digital audio format (e.g. MP3). All communication between the therapists and the participants was asynchronous. Each week participants worked in the program independently, and were expected to complete each module at their own convenience within a week. As home work assignments, the participants were instructed to read the weekly text, complete the exercises related with a particular module, and reflect upon questions arising from the weekly process, as well as report on

outcomes from specific assignments. For example, they were instructed to reflect upon their values (week 1) and value-based actions (week 2), report their reflexions and place the written report in their own folder in a secured encrypted platform. The therapists provided support and written feedback once a week, on a certain date. The feedback was placed in the participant's personal folder within the platform so that they could read it. Each coach could access the home assignments completed by their allocated participant to monitor progress. If the participants did not complete their assignment by the given date, the student therapist sent them an SMS reminder via mobile phone. The therapists were also instructed to suggest possible additional exercises or metaphors suitable for each participant's condition and progress. The student therapists were instructed to keep the weekly feedback as short as possible, preferably about 15–30 min per week. However, they spent on average 40 min on feedback tasks that was more than instructed. The time spent on feedback varied significantly from week to week, from 44.47 min (*Mean*; range 15–150 min) in the first week to 36.25 min (*Mean*; range 20–90 min) in the last week.

A final face-to-face meeting took place after the 6-week Internet intervention. During this session, the participant and the student therapist made a summary of their experiences and observations made during the entire treatment process, and made an individual plan for the future including value-based actions. For the iACT group, the website was accessible 6 months after the treatment period. 8 (42.1%) participants reported that they had not used the Internet program at all after the treatment period, 11 (57.9%) participants reported that they had logged into the program 1–5 times after the treatment period, but only during 1–2 months following the post-measurement.

#### *The face-to-face intervention (ACT)*

During the ACT face-to-face treatment, student therapists were instructed to follow the themes in the same order as in the iACT group, and apply the methods of Acceptance and Commitment Therapy according to the participant's situation. The therapy sessions lasted approximately 60 min each and took place at the Department of Psychology, University of Jyväskylä, Finland. The length of the treatment (6 weeks) was the same as in the iACT group. The therapists were instructed to work according to two leading guidelines. First, they were instructed to find out, in co-operation with the participant, how the participant could most effectively influence his/her life by value-based actions; that is, to 'activate' the participant between the sessions. The second guideline focused on working with emotional and verbal barriers that may make it difficult for the participant to take needed actions towards good life.

Session 1 was identical with that of the iACT group with the aim to cover the participant's situation and based on it to construct a functional analysis clinical case model (FACCM) that was presented to the supervisor between Sessions 1 and 2, and viewed with the client during Session 2. During Session 2, after presenting the FACCM, the therapist conducted a value analysis based on the participant's value description, followed by experiential exercises. Although sessions 3, 4, and 5 were more personally tailored, they were based on the ACT book for therapists ([Lappalainen et al., 2004](#)) including experiential exercises and metaphors according to the ACT model. During the last Session (6), experiences and observations were discussed, and an individual plan for the future including value-based actions was made.

ACT metaphors and exercises presented in the ACT-book for therapists ([Lappalainen et al., 2004](#)) were used throughout the entire treatment. The therapists were required to conduct at least one mindfulness exercise and at least one individually tailored

**Table 2**  
Mean scores and standard deviation for depression, physical and psychological symptoms, general health, and life satisfaction at pre, post, 6-month follow-up and 18-month follow-up. Between-group effect-sizes (Hedges *g*) with 95% confidence intervals (CI) are also presented (pre-measurement difference corrected Hedges *g* in parentheses).

Outcome and condition	Pre <i>M</i> ( <i>SD</i> ) CI	Post <i>M</i> ( <i>SD</i> ) CI	F-up 6-mo <i>M</i> ( <i>SD</i> ) CI	F-up 18-mo <i>M</i> ( <i>SD</i> ) CI	Wald test <i>df</i> = 3	<i>P</i> -value
BDI-II					11.48	0.009
iACT	20.79 (9.34) 16.29; 25.29	10.26 (8.20) 6.31; 14.21	8.74 (6.67) 5.52; 11.95	8.32 (5.54) 5.65; 10.99		
ACT	23.11 (6.38) 20.03; 26.18	9.17 (5.24) 6.56; 11.77	14.53 (8.16) 10.34; 18.72	12.19 (9.25) 7.26; 17.11		
Hedges <i>g</i> CI	−0.28 −0.92; 0.36	0.15 (0.43) −0.49; 0.80	−0.76 (−0.48) −1.44; −0.09	−0.51 (−0.23) −1.18; 0.17		
SCL-90					3.15	NS
iACT	1.11 (0.42) 0.91; 1.32	0.58 (0.37) 0.40; 0.76	0.62 (0.40) 0.43; 0.81	0.46 (0.34) 0.30; 0.63		
ACT	1.04 (0.37) 0.86; 1.21	0.64 (0.36) 0.46; 0.82	0.81 (0.45) 0.58; 1.04	0.60 (0.39) 0.40; 0.80		
Hedges <i>g</i> CI	0.18 −0.46; 0.81	−0.16 (−0.34) −0.81; 0.48	−0.44 (−0.62) −1.10; 0.22	−0.38 (−0.56) −1.05; 0.29		
GHQ-12					10.79	0.012
iACT	22.26 (6.06) 19.34; 25.19	10.11 (6.84) 6.81; 13.40	10.53 (4.64) 8.29; 12.76	10.58 (5.40) 7.98; 13.18		
ACT	19.37 (5.63) 16.66; 22.08	10.28 (5.22) 7.68; 12.87	14.71 (6.77) 11.22; 18.19	12.19 (6.95) 8.48; 15.89		
Hedges <i>g</i> CI	0.48 −0.16; 1.13	−0.03 (−0.51) −0.67; 0.62	−0.71 (−1.19) −1.39; −0.04	−0.26 (−0.74) −0.92; 0.41		
Life satisf					12.77	0.005
iACT	39.11 (17.44) 30.70; 47.51	63.42 (14.63) 56.37; 70.47	66.95 (16.80) 58.85; 75.05	69.79 (10.66) 64.65; 74.93		
ACT	45.63 (13.53) 39.11; 52.15	56.61 (15.21) 49.05; 64.17	52.94 (19.82) 42.75; 63.13	63.06 (21.81) 51.44; 74.69		
Hedges <i>g</i> CI	−0.41 −1.05; 0.23	0.45 (0.86) −0.21; 1.10	0.75 (1.16) 0.07; 1.43	0.39 (0.80) −0.28; 1.07		

experiential exercise during every session. During the whole study, the student therapists used altogether 27 different experiential exercises and 31 metaphors. Each participant in the face-to-face group completed on average 9.11 exercises (*SD* = 3.69; range 2–15) and heard 6.50 metaphors (*SD* = 4.09; range 1–13) during the whole treatment. After each session, the participant was instructed to conduct value-based actions as homework assignment, to apply ACT principles, and to conduct mindfulness exercises daily.

#### Therapist adherence to the intervention protocol

Student therapists were required to keep record of their diary. The aim was to monitors therapists' adherence to the ACT intervention protocol. In their diaries, the therapists were required to make notes after each session specifying the methods they had used during a given session. The diaries were checked by the supervisor and collected after the treatment period. In addition to the diaries, the student therapists were also asked to report the methods they had used each week during the therapy (ACT group). In our previous study, we found good correspondence between reports done by the checklist and independent observers' ratings (from audio recordings) regarding the frequency of use of the method (Haapala, 2008; Cohen's kappa = 0.82). The student therapists were moderately confident with ACT (*M* = 6.89; *SD* = 0.96; on a scale 0–10). The acceptance of the principles and methods of ACT was rated higher (*M* = 8.28, *SD* = 0.83).

#### Statistical analyses

Differences between the intervention groups before the start of the treatment were tested using *T*-tests. The data investigating the effects of interventions were analyzed using hierarchical linear

modeling (HLM) in Mplus (version 7) (Muthén and Muthén, 2012). The most important advantage in this study using HLM with full information maximum likelihood (FIML) estimation method instead using repeated measures ANOVA/MANOVA is that it uses all the available information. The missing data in HLM&FIML is supposed to be Missing At Random (MAR). ANOVA/MANOVA approach uses listwise deletion requiring that the missing data have to be Missing At Completely Random (MCAR). This listwise deletion has greater effect to statistical power compared to HLM/FIML method. The HLM uses a full information approach, with standard errors that are robust in the case of a non-normal distribution (MLR estimator in Mplus). The effect of change was tested with the help of six dummy coded variables in which the three dummy variables test the changes for the iACT group and three dummy variables test differences in change between the iACT group and the ACT group. Dummy variables measure the change from (a) pre- to post-measurement, (b) the change from post- to 6-month follow-up and (c) the change from 6-month follow-up to 18-month follow-up. First, the group × time interaction was tested with Wald test. Secondly, if the interaction was statistically significant the group differences were tested for each tree dummy variables separately and further the change was tested for both groups separately.

Effect sizes (ES) are reported using Hedges' *g*. They were calculated as follows. The *between-group* ES was calculated after the treatment and at follow-ups by dividing the difference between the Internet treatment group mean and the face-to-face group mean by the pooled standard deviation of the two conditions. The *within-group* ES was calculated for both the post- and follow-up measurements by dividing the mean change from pre-measurement by the combined (pooled) standard deviation (*SD*) and by dividing the mean change from the pre- to follow-up measurements with combined *SD* (Feske & Chambless, 1995; Morris & DeShon, 2002). Due to small sample size the possible bias of ES was corrected by

**Table 3**

Mean scores for psychological flexibility, mindfulness, automatic thoughts, and thought suppression at pre, post, 6-month follow-up and 18-month follow-up. Between group effect sizes are also presented. Between-group effect-sizes (Hedges *g*) with 95% confidence intervals (CI) are also presented (pre-measurement difference corrected Hedges *g* in parentheses).

Outcome and condition	Pre <i>M</i> ( <i>SD</i> ) CI	Post <i>M</i> ( <i>SD</i> ) CI	F-up 6-mo <i>M</i> ( <i>SD</i> ) CI	F-up 18-mo <i>M</i> ( <i>SD</i> ) CI	Wald test <i>df</i> = 3	<i>P</i> -value
AAQ-II					5.05	NS
iACT	41.21 (9.25) 36.75; 45.67	47.47 (9.93) 42.69; 52.26	50.26 (9.45) 45.71; 54.82	53.16 (12.27) 47.25; 59.07		
ACT	39.00 (10.08) 34.14; 43.86	48.94 (8.48) 44.73; 53.16	46.71 (11.06) 41.02; 52.39	49.31 (8.23) 44.93; 53.70		
Hedges <i>g</i> CI	0.22 −0.41; 0.86	−0.16 (−0.38) −0.80; 0.49	0.34 (0.12) −0.32; 1.00	0.35 (0.13) −0.32; 1.02		
KIMS					4.15	NS
iACT	120.05 (17.64) 111.55; 128.55	126.00 (16.37) 118.11; 133.89	129.26 (19.05) 120.08; 138.45	130.00 (15.37) 122.59; 137.41		
ACT	120.53 (12.51) 114.50; 126.56	125.94 (16.72) 117.63; 134.26	122.65 (18.36) 113.21; 132.09	130.31 (19.58) 119.88; 140.74		
Hedges <i>g</i> CI	−0.03 −0.76; 0.61	0.00 (0.03) −0.64; 0.65	0.35 (0.38) −0.31; 1.00	−0.02 (−0.01) −0.68; 0.65		
ATQ-F					1.90	NS
iACT	74.79 (24.09) 63.18; 86.40	53.58 (16.80) 45.48; 61.68	54.05 (18.39) 45.19; 62.91	48.89 (13.56) 42.36; 55.43		
ACT	76.95 (17.54) 68.49; 85.40	56.94 (18.42) 47.79; 66.10	63.71 (22.25) 52.27; 75.14	61.44 (24.18) 48.55; 74.32		
Hedges <i>g</i> CI	−0.10 −0.74; 0.54	−0.19 (−0.09) −0.83; 0.46	−0.47 (−0.37) −1.13; 0.20	−0.64 (−0.54) −1.32; 0.04		
ATQ-B					0.60	NS
iACT	70.05 (26.26) 57.40; 82.71	50.95 (14.37) 44.02; 57.87	54.32 (20.54) 44.42; 64.22	50.05 (18.01) 41.37; 58.73		
ACT	74.79 (18.06) 66.08; 83.49	61.67 (27.51) 47.99; 75.35	59.41 (22.14) 48.03; 70.79	53.19 (17.86) 43.67; 62.71		
Hedges <i>g</i> CI	−0.21 −0.84; 0.43	−0.48 (−0.27) −1.14; 0.17	−0.23 (−0.02) −0.89; 0.42	−0.17 (−0.04) −0.84; 0.50		
WBSI					5.30	NS
iACT	49.79 (9.25) 45.33; 54.25	43.21 (10.49) 38.16; 48.26	39.53 (11.59) 33.94; 45.11	39.16 (12.04) 33.35; 44.96		
ACT	46.84 (12.77) 40.69; 53.00	46.89 (12.20) 40.82; 52.96	45.35 (13.97) 38.17; 52.53	42.75 (14.49) 35.03; 50.47		
Hedges <i>g</i> CI	0.26 −0.38; 0.90	−0.32 (−0.58) −0.97; 0.33	−0.45 (−0.71) −1.11; 0.22	−0.27 (−0.53) −0.93; 0.40		

unbiased estimate of Hedges' *g* (Hedges, 1981; Hedges & Olkin, 1985). A *between-group* effect size of 0.2 was considered small, 0.5 was medium, and 0.8 was large. A *within-group* ES of 0.5 was considered small, 0.8 was medium, and 1.1 was large (Roth & Fonagy, 1996; Öst, 2006).

The clinical significance of the change was evaluated using the Jacobson–Truax method, which consists of two steps in the evaluation of recovering individuals (Lambert & Ogles, 2009). The first step calculates the reliable change index (RCI). Reliable Change is about whether people changed sufficiently that the change is unlikely to be due to simple measurement unreliability. The second step calculates the cut-off value to find a weighted midpoint between the means of patient and a non-patient population (e.g. Atkins, Bedics, McClinchey, & Beauchaine, 2005). These two steps are used to classify individuals into one of four categories including: recovered (individual has passed the Cutoff and the RCI in the positive direction), improved (has passed the RCI in the positive direction but not the Cutoff), unchanged (has passed neither criterion), or deteriorated (has passed the RCI in the negative direction). Calculating the RCI and the Cutoff, the results of Beck's validation study was used: the mean and standard deviation of BDI-II for non-patient was 7.65 and 5.9, respectively, and internal consistence was  $\alpha = 0.91$  (Beck et al., 2004). The mean and standard deviation of BDI-II for participants using the values of this study were 21.95 (*M*) and *SD* = 7.98. In addition to this, the number of participants classified with none or very few depressive symptoms (0–13), mild depression (14–19), moderate depression (20–28),

and severe depression according to the BDI-II (29–63) were reported at pre- and 18-month follow-up.

## Results

### Participant adherence to the protocol and participant satisfaction

Data were available for 37 participants (drop-out rate 2.6%) at post-measurement, for 36 participants at 6-month follow-up (drop-out rate 5.3%) and for 35 participants (drop-out rate 7.9%) at 18-month follow-up.

Participant satisfaction was evaluated on a scale from 1 to 10 at post-measurement. Participants in the iACT group evaluated the intervention with 8.42 (*SD* = 1.35) compared with 8.83 (*SD* = 0.86; *n* = 18) in the ACT group. On a scale from 1 to 10, the mean for recommending this kind of intervention to others was 8.16 (*SD* = 2.19) in the iACT group (*n* = 19) whereas the mean in the ACT group (*n* = 18) was 9.06 (*SD* = 1.26). At 18-month follow-up, 18 participants (94.7%) in the iACT group (*n* = 19), and 13 participants (92.9%) in the ACT group (*n* = 14) stated that they would recommend the treatment to others.

### Symptom measures

Before the start of the treatment, there were no significant differences in any of the symptom measures between the two groups. First, we investigated whether the groups changed differently over

time from pre- to 18-month follow-up. We observed significantly different change in the iACT group as compared to the ACT group in BDI-II, GHQ-12 and life satisfaction, but not in SCL-90 (Table 2). The change in BDI-II and GHQ-12 was different between the groups from post- to 6-month follow-up (BDI-II,  $p < 0.001$  and GHQ-12,  $p = 0.005$ ). The change in life satisfaction was different during the active treatment period (from pre-to-post,  $p = 0.067$ ). As can be seen from Table 2, depressive symptoms decreased in the iACT group during the first follow-up phase (from post- to 6-month follow-up) while they increased in the face-to-face group during the same period. The treatment effect in general health (GHQ-12) persisted in the iACT group whereas there was a negative change in the ACT group. In self-rated life satisfaction, both groups showed positive change during the whole study period, but the change was significantly larger in the iACT group during the active intervention phase (pre-to-post, Table 2). During the second follow-up period (from 6 to 18-month follow-up), the treatment effect persisted in both groups. We also tested the changes for both groups separately. As we can see from Table 2, depressive symptoms (BDI-II) as well as psychological symptoms (SCL-90) decreased significantly in both groups during the study period (from pre- to 18-month follow-up) (BDI-II: iACT; Wald test ( $W$ ) = 46.02,  $df = 3$ ,  $p < 0.001$ ; ACT;  $W = 96.35$ ,  $df = 3$ ,  $p < 0.001$ ; SCL-90: iACT;  $W = 66.38$ ,  $df = 3$ ,  $p < 0.001$ ; ACT;  $W = 41.40$ ,  $df = 3$ ,  $p < 0.001$ ). Also, general health improved and self-rated life satisfaction increased significantly in both groups from pre- to the 18-month follow-up (GHQ-12: iACT;  $W = 74.30$ ,  $df = 3$ ,  $p < 0.001$ ; ACT;  $W = 28.70$ ,  $df = 3$ ,  $p < 0.001$ ; Satisfaction: iACT;  $W = 33.47$ ,  $df = 3$ ,  $p < 0.001$ ; ACT;  $W = 26.00$ ,  $df = 3$ ,  $p < 0.001$ ).

Between-group effect sizes indicated medium-sized differences at 6-month follow-up in depressive symptoms (BDI-II,  $g = 0.76$ ), general health (GHQ-12,  $g = 0.71$ ), and life satisfaction ( $g = 0.75$ ) in favor of the iACT group (Table 2). In SCL-90, the effect size was small ( $g = 0.44$ ) at 6-month follow-up. One and a half year after the treatment, between-group effect sizes were small in most of the symptom measures.

Within-group effect sizes indicate that the overall effectiveness of the iACT group (from pre- to 18-month follow-up measurement) was large on all outcome measures. Depressive symptoms decreased significantly during pre-to-post-measurement ( $g = 1.17$ ), pre- to 6-month follow-up measurement ( $g = 1.45$ ), and pre- to 18-month follow-up measurement ( $g = 1.59$ ). Similar patterns were noticed in experienced symptoms (SCL-90, pre-to-post,  $g = 1.31$ ; pre- to 6-month follow-up,  $g = 1.17$ ; pre- to 18-month follow-up,  $g = 1.67$ ), for general health (GHQ-12, pre-to-post,  $g = 1.84$ ; pre- to 6-month follow-up,  $g = 2.13$ ; pre- to 18-month follow-up,  $g = 1.99$ ), and for life satisfaction (pre-to-post,  $g = 1.48$ ; pre- to 6-month follow-up,  $g = 1.59$ ; pre- to 18-month follow-up,  $g = 2.08$ ). For the ACT group, large effect sizes were found in terms of depressive symptoms (BDI-II, pre-to-post,  $g = 2.33$ ; pre- to 6-month follow-up,  $g = 1.15$ ; pre- to 18-month follow-up,  $g = 1.37$ ), experienced symptoms (SCL-90, pre- to 18-month follow-up  $g = 1.13$ ), and general health (GHQ-12, pre-to-post,  $g = 1.64$ ; pre- to 18-month follow-up,  $g = 1.12$ ). Medium effect size was detected for life satisfaction during the pre- to 18-month follow-up period ( $g = 0.96$ ).

#### Psychological flexibility and mindfulness measures

Before the start of the treatment, there were no significant differences in any of the measures assessing flexibility, mindfulness and thought suppression between the two groups. No significant group  $\times$  time interaction effect was found. Thus, there was a similar change in all process measures (AAQ-II, KIMS, ATQ-F, ATO-B and WBSI) during the study period in both groups. As we can see from

Table 3, there was a significant increase in psychological flexibility and mindfulness skills in both groups during the whole study period (AAQ-II: iACT;  $W = 16.82$ ,  $df = 3$ ,  $p = 0.0008$ ; ACT;  $W = 25.00$ ,  $df = 3$ ,  $p < 0.001$ ; KIMS: iACT;  $W = 13.62$ ,  $df = 3$ ,  $p = 0.004$ ; ACT;  $W = 10.61$ ,  $df = 3$ ,  $p = 0.014$ ). Likewise, ATQ-F changed significantly in both groups over time from pre- to 18-month follow-up (iACT;  $W = 18.36$ ,  $df = 3$ ,  $p = 0.0004$ ; ACT;  $W = 26.22$ ,  $df = 3$ ,  $p < 0.001$ ). However, ATQ-B and WBSI changed significantly only in the iACT group from pre- to 18-month follow-up (ATQ-B;  $W = 15.97$ ,  $df = 3$ ,  $p = 0.0012$ ; WBSI;  $W = 21.51$ ,  $df = 3$ ,  $p = 0.0001$ ). In the ACT group the change in ATQ-B and WBSI was non-significant (ATQ-B;  $W = 1.57$ ,  $df = 3$ ,  $p = 0.67$ ; WBSI;  $W = 2.11$ ,  $df = 3$ ,  $p = 0.55$ ).

Between-group effect sizes were small at post- and follow-up measurement. However, a medium-sized effect was observed on the subscale frequency of automatic thoughts (ATQ-F) at 18-month follow-up in favor of the iACT group. Medium and small within-group effect sizes ( $d = 0.00$ – $1.08$ ) were detected on most measures in both groups. Large within-group effect sizes were found on the subscale frequency of automatic thoughts in the iACT group during the entire study period (ATQ-F, pre-to-post,  $g = 1.70$ ; pre to 6-month follow-up,  $g = 1.52$ ; pre-to 18-month follow-up,  $g = 2.53$ ). In the ACT group, large effect size was found on the subscale believability of automatic thoughts (ATQ-B, pre- to 18-month follow-up,  $g = 1.17$ ). Interestingly, medium effect sizes could be detected for thought suppression in the iACT group during the whole study period (WBSI, pre-to-post,  $g = 0.65$ ; pre to 6-month follow-up,  $g = 0.96$ ; pre- to 18-month follow-up,  $g = 0.97$ ) whereas the effect sizes for thought suppression in the ACT group were small or non-existing (pre- to-post,  $g = 0.0$ ; pre- to 6-month follow-up,  $g = 0.18$ ; pre- to 18-month follow-up,  $g = 0.29$ ).

#### Clinical significance

We examined clinical significance (Jacobson & Truax, 1991) at post- and at 18-month follow-up measurement in terms of depressive mood based on the BDI-II (Beck et al., 2004) using four categories: (1) recovered, (2) improved, (3) unchanged, (4) deteriorated. At pre-measurement, 4 participants in the iACT group and 2 participants in the ACT group had non-clinical status. When excluding participants with BDI scores under 14, and examining the iACT group at post-measurement ( $n = 15$ ), we found that 60.0% (9) were recovered, 20.0% (3) were improved, 13.3% (2) remained unchanged and 6.7% (1) deteriorated. In the ACT group ( $n = 16$ ), 75.0% (12) were recovered, 25.0% (4) improved, and there were no unchanged or deteriorated participants. At 18-month follow-up, the percentages in the iACT group ( $n = 15$ ) were 80.0% (12) recovered, 6.7% (1) improved, and 13.3% (2) unchanged. The ACT group ( $n = 14$ ) reported the following percentages: 42.9% (6) recovered, 42.9% (6) improved, and 14.3% (2) unchanged. No one had deteriorated. There was a trend for a significant difference between the groups at 18-month follow-up in the favor of the iACT group ( $\chi^2 = 5.54$ ,  $df = 2$ ,  $p = 0.06$ ). Five participants in the iACT group were on depression medication at 18-month follow-up compared to 3 participants in the ACT group. Also, 2 persons in both groups reported having received psychotherapy during the past year before 18-month follow-up.

Changes in the severity of the depressive symptoms during the study period were also studied. Based on BDI-II depression categories (0–13 points = no depression, 14–19 points = mild depression, 20–28 points = moderate depression, and 29–63 = severe depression), 4 (21%) participants in the iACT group ( $n = 19$ ) were classified as severely depressed, 5 (26.3%) as moderately depressed and 6 (31.6%) as mildly depressed, and 4 (21%) were classified not been depressed at pre-measurement. The



equivalent percentages in the face-to-face ACT group ( $n = 18$ ) were 4 (22.2%) severely depressed, 9 (50%) moderately depressed, 3 (16.7%) mild depressed and 2 participants (11.1%) were not depressed. At 18-month follow-up, the amount of participants classified as depressed had clearly declined: 16 (84.2%) participants in the iACT group were classified as not depressed and 3 (15.8%) were mildly depressed. There were no participants in the iACT group who were moderately or severely depressed. For the reference group, the equivalent scores at 18-month follow-up were: 8 (50%) had no depression, 4 (25%) were mild depressed and 4 (25%) were moderately depressed. All things considered, BDI scores decreased by 12.47 points ( $SD = 2.31$ ; Confidence Interval (CI) 95% for the difference = 7.63; 17.32) in the iACT group, and by 10.56 points ( $SD = 1.88$ ; Confidence Interval (CI) 95% for the difference = 6.55; 14.58) in the ACT group during the 19-month (one month of treatment and 18-month follow-up) study period.

## Discussion

The objective of this study was to investigate the effectiveness of a guided 6-week Internet-delivered ACT-based intervention (iACT) for depressive symptoms when compared with a 6-week ACT-based face-to-face intervention (ACT) when both treatments were administered by the same student therapist. Because earlier studies conclude that Internet-delivered CBT with the guidance of a therapist could be as effective as face-to-face treatment (Andersson & Cuijpers, 2009; Ruwaard et al., 2009; Titov, 2011), we wanted to investigate if that would be the case with two equivalent, but differently delivered ACT-based interventions, as well. We expected that both interventions would have similar effects in reducing depressive symptoms and psychological distress.

### *Effects on psychological health*

Our study showed that all symptom measures changed significantly over time during the entire study period (pre- to 18-month follow-up). Both ACT-based interventions not only affected depressive symptomatology but also psychological and physiological symptoms, general health and life satisfaction. Interestingly, our data indicated that the iACT group changed differently and the change was significant in favor of the iACT group with regard to depressive symptoms (BDI-II), general health (GHQ-12), and satisfaction with life. The *between-group* effect sizes showed a medium-sized difference at 6-month follow-up in depression symptoms, general health and life satisfaction in favor of the iACT group. At 18-month follow-up, a medium-sized difference was observed only in depressive symptoms. At 18-month follow-up, the effect of both ACT-based interventions was large on symptom measures. With regard to the clinical significance, both groups showed high rates of recovery and improvement as measured by BDI-II at post-measurement: totally 80% of the participants in the iACT group were recovered (60%) and improved (20%), and 100% in the face-to-face group (75% recovered, 25% improved). At the 18-month follow-up, 80% were recovered and 6.7% were improved in the iACT group. In the face-to-face group the percentages were 42.9% and 42.9%. Overall our study showed that both groups were effective, but there was a tendency for a slightly better recovery in the iACT group. In line with Mackinnon, Griffiths, and Christensen (2008), our study provided evidence that the effects of brief Internet-based interventions sustain even after the cessation of the treatment.

### *Effects on psychological flexibility and mindfulness skills*

Both ACT-based interventions had a significant effect on process measures, such as psychological flexibility (AAQ-II) and

mindfulness skills (KIMS). Thus, as expected, both ACT-based interventions had a significant effect on acceptance and mindfulness skills. The results indicate that both interventions had a significant impact on participants' ACT-related processes.

The findings of this study confirm the conclusions regarding the effectiveness of guided Internet treatments for depression. Inline with other studies, our study demonstrates that the Internet can be an effective medium for the delivery of interventions designed to reduce the symptoms of depression (Griffiths et al., 2010). Moreover, studies suggest that Internet-delivered treatment with the guidance of a therapist can lead to improvement of equal size similar to more traditional format, face-to-face psychotherapy (Andersson et al., 2013; Cuijpers et al., 2010; Fledderus et al., 2012; ; Spek, Nyklicek, et al., 2007; Wagner, Horn, & Maercker, 2014). Our study confirms these results and suggests that even a guided ACT-based Internet intervention can be as effective as an ACT-based face-to-face treatment. In line with other observations we can also conclude that treatment delivered by relatively inexperienced therapists can be effective. According to Titov (2011), excellent clinical effects can be obtained from well-structured Internet-delivered programs that provide low-intensity support. People can provide the support without specialist training, providing that they are well supervised (e.g. Robinson et al., 2010; Titov, 2011; Titov et al., 2010). Therefore, in line with Lappalainen et al. (2007), Öst, Karlstedt, and Widén (2012) and Kohtala, Lappalainen, Savonen, Timo, & Tolvanen (2013), we can conclude that outpatients can be effectively treated by clinically inexperienced student therapists under supervision by an experienced supervisor.

In addition to the effectiveness and sustainability of an Internet-based ACT-intervention, our study also indicates that the effects of a brief ACT-based 6-session intervention for participants reporting depressive symptoms are maintained at least one and a half year after the treatment. A brief ACT-based intervention seems to be sufficient for having an impact on psychological flexibility and mindfulness skills. This study also delivers evidence for how acceptance and mindfulness processes can be significantly affected through an Internet-based ACT treatment.

### *Acceptance and client satisfaction*

Only one (1) participant dropped out during the active treatment (pre-post). One (1) participant dropped out during the 6-month follow-up and one (1) participant during the 18-month follow-up. All of them belonged to the face-to-face ACT group. There were no dropouts in the iACT group. The high completion rate may be explained by the fact that the satisfaction with both interventions was rather high. Additionally, this study adds to the existing research that shows that the client dropout rate in Internet-delivered treatments is not higher than in traditionally delivered face-to-face therapy (Green & Iverson, 2009). Participants in both interventions were equally satisfied with the intervention after the treatment period and were almost as satisfied with the treatment at 18-month follow-up as they were right after the treatment period. At the 18-month follow-up, all except one participant in both groups would still recommend this kind of treatment to others. The participants in the iACT group reported that they were initially slightly uncertain about the treatment being carried out mainly via the Internet. At the end, however, most clients were very positive about the treatment.

According to Cuijpers et al. (2008), self-help interventions might even be more suitable for some patients than traditional face-to-face CBT. One of the advantages of self-help interventions compared to ordinary treatment is the possibility to easily return to previous modules in the text material, whereas ordinary treatment requires that the client remembers the content of the previous

session (Andersson, Cuijpers, Carlbring, & Lindefors, 2007). Essentially, the client works independently in the material, makes most of the treatment decisions and exercises, and is more or less his/her own therapist (Andersson et al., 2007). Our study appears to be in line with these findings. In our sample, participants reported having taken the responsibility for their own wellbeing and having become independent from the therapist. An example for how the Internet-based program fostered responsibility taking in participants is the following testimonial given by one client from the iACT group: *"The Good Life Compass is great! And the materials are excellent! I really appreciate the treatment philosophy: one must take the responsibility and lead one's life into valued direction. Years of going to therapy and talking about the problems didn't help me at all but I found this very useful"*. The participants also appreciated the fact that they had the possibility to return to previous modules and exercises whenever it was convenient for them. They also reported that one advantage with the Internet program was the fact that they could access the site anytime, conduct exercises and rehearse the content if they had not understood it for the first time and needed more time to reflect on it. These advantages with the Internet-based approach could be possible reasons for slightly better effects of the iACT group during the follow-up.

### Limitations

The obvious limitation is the small sample size that limits the generalizability of the results. Therefore, the results must be replicated in a larger study. The sample could be seen as another limitation since it was gathered via a newspaper advertisement. Subjects who are responding to a newspaper advertisement may be very motivated which may improve their results when compared to subjects who receive treatment. This might be the case in our study.

Second, the participants were not diagnosed. Instead, they were thoroughly interviewed using the criteria of DSM-IV for depression. The pre-measurement included also a self-reported diagnoses form with all the DSM-IV questions that the participants filled out. About half of the participants had depression diagnosis. There were no differences in outcome between those who had or who did not have a depression diagnosis at the beginning of the treatment. This suggests that the interventions are effective also for those having a diagnosis of depression.

An additional limitation is that the face-to-face sessions were not recorded. Thus, adherence to the ACT model could not be tested with videotaped sessions, but supervision and treatment diaries demonstrated the student therapists' adherence to the ACT protocol. The treatment diaries including the conducted exercises during the face-to-face treatment show that the students were highly motivated to use the treatment approach they were trained in. Moreover, the data showed that there was a significant change in psychological flexibility and mindfulness skills during the intervention supporting the view that the student therapists actually applied ACT procedures as expected. During the same supervision sessions, participants in both face-to-face and the Internet-based treatment group were discussed, which guaranteed exactly the same content of the weekly supervision. The influence of the therapist was controlled by the fact that each student therapist treated one client in the ACT and one in the iACT group. Thus, the only difference between the treatments was the way of delivery mode. This is supported by the observation that there were similar changes in psychological flexibility and mindfulness skills. However, we did not carry out more detailed analyses of how the flexibility, mindfulness and thought suppression measures affected the outcomes (mediation). It should also be observed that these results cannot be generalized to experienced therapists conducting

the treatment, but to trainee Psychology students receiving brief training in ACT model.

### Clinical implications and future directions

This study provides evidence that a guided Internet-delivered ACT intervention can be as effective as an ACT-based face-to-face treatment, and the results point to a slightly better maintenance of treatment effects in the Internet-based treatment group at follow-up. Although the results might be seen as preliminary, they demonstrate that brief ACT-based treatments can be effective in lessening depressive symptoms and maintaining the treatment effects over a longer period. The results also illustrate that Internet-delivered ACT combined with 2 face-to-face sessions and weekly support can create positive changes in the treatment of depressive symptoms. Our findings add to previous studies suggesting that long-term effects can occur in Internet-delivered treatments, as well (e.g. Carlbring, Bergman Nordgren, Furmark, & Andersson, 2009). The results are promising and demonstrate that even relatively inexperienced student therapists are well able to guide participants during treatment and that training in coaching Internet-based ACT interventions could very well be embedded within the psychology curriculum.

Future research is needed to find out how much guidance is optimal, and whether Internet-based treatment programs get better results if they include input from experienced therapists compared to student therapists. Further research should investigate the best way of providing Internet-based treatment and for whom Internet-delivered ACT treatment is best suited. Further research is needed to find out whether ordinary, face-to-face delivered treatments would benefit from having certain parts of the treatment protocol (e.g. exercises) from the Internet so that the client could practice without having to try to remember the content or exercises of the previous session.

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