



Internet-delivered acceptance-based behavior therapy for generalized anxiety disorder: A pilot study



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ABSTRACT

Objective: Internet-delivered cognitive behavior therapy (ICBT) has been developed and tested for treating persons with generalized anxiety disorder (GAD). A new form of CBT focuses on acceptance (of internal experiences or difficult psychological content), mindfulness and valued actions. To date this form of CBT has not been delivered via the internet for persons with GAD. The aim of this study was to describe the functionality of a new internet-delivered acceptance-based behavior therapy for GAD, and to test the effect of the intervention in an open pilot trial. **Methods:** Following exclusion of two patients we included 14 patients diagnosed with GAD from two primary care clinics. At 2–3 months follow-up after treatment 10 patients completed the outcome measures. The treatment lasted for an average of 15 weeks and consisted of acceptance-based techniques, behavior therapy components and homework assignments.

Results: A majority of participants completed all modules during the treatment. Findings on the Penn State Worry Questionnaire showed a within-group improvement of Cohen's $d = 2.14$ at posttreatment. At the follow-up results were maintained. Client satisfaction ratings were high.

Conclusions: We conclude that internet-delivered acceptance-based behavior therapy potentially can be a promising new treatment for GAD. A controlled trial of the program has already been completed.

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1. Introduction

Generalized anxiety disorder (GAD) is a common disorder characterized by excessive and uncontrollable worry. The lifetime prevalence of GAD is estimated to be between 4.3 and 5.9% (Tyler and Baldwin, 2006), and the disorder is best described as a chronic condition if left untreated (Tyler and Baldwin, 2006). Apart from excessive worry and anxiety GAD is associated with a number of other symptoms such as tension, difficulties in concentration and sleep problems (American Psychiatric Association, 2013). Comorbid psychiatric disorders are common with high rates of depression (Johansson et al., 2013), other anxiety disorders and substance abuse (Heimberg et al., 2004). Apart from considerable personal difficulties the disorder also leads to a high economic burden to society with high rates of health care consumption and days on sick leave (Revicki et al., 2012).

Several different psychological treatments for GAD exist, but cognitive behavioral therapy (CBT) is the most studied (Cuijpers et al., 2014). CBT targeting GAD is traditionally based on self monitoring, cognitive

restructuring and relaxation (Heimberg et al., 2004). Additional interventions often used are problem solving, exposure and stimulus control. A recent meta-analysis showed moderate to large between group effects of CBT compared to no treatment control (Cuijpers et al., 2014). A relatively new form of CBT focuses on acceptance, mindfulness and valued actions, and this treatment is often but not always referred to as acceptance and commitment therapy (ACT) (Hayes et al., 2006). These approaches are about acceptance of internal experiences or difficult psychological content (Hayes et al., 2006). Acceptance-based CBT has some support as a treatment for GAD (Hayes-Skelton et al., 2013; Roemer et al., 2008), with a study indicating that ACT can be as effective as CBT (Avdagic et al., 2014).

There are now a large number of controlled trials on therapist-guided internet-based cognitive behavior therapy (ICBT) for a range of psychiatric and somatic conditions (Andersson, 2014). Indeed, a meta-analysis on direct comparisons between ICBT and face-to-face CBT showed equivalent findings (Andersson et al., 2014), but the number of trials is still small when it comes to certain specific conditions, like GAD. Previous ICBT studies on GAD indicate that ICBT can be effective. The worry program developed by Titov and colleagues was tested in a controlled trial in which 48 participants were randomized to treatment or wait list control. The treatment program included six online modules

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with homework assignments, participation in an online discussion forum and weekly contact with a therapist. The results showed large to moderate between group effect sizes on primary GAD measures as well as secondary outcomes (Titov et al., 2009). In a second controlled trial 145 participants were randomized to clinician-assisted treatment, technician-assisted treatment or wait list control (Robinson et al., 2010). The treatments lasted for eight weeks and the program was slightly modified from the first trial. Large within-group effects were found on both primary GAD measures and on secondary measures for both treatment groups and only small differences in effects were found between the two forms of assistance.

Two controlled trials have evaluated a Swedish treatment program for GAD called Origo. In the first study 89 participants were randomized to treatment or wait list control (Paxling et al., 2011). The treatment lasted for eight weeks and consisted of eight modules with homework assignments and weekly contact with a psychology student. The results showed large between-group effects on primary GAD measures and effects were maintained at three-year follow-up. In a second trial with 81 participants the same program was compared against a psychodynamic internet-based treatment (Andersson et al., 2012). At post treatment both groups showed large within-group effects that were maintained at 18 months follow-up. At post treatment and follow-up only small between-group effects were found when comparing the active treatments and the waitlist control group. These studies indicate that ICBT for GAD can be effective. The existing ICBT programs are however largely based on traditional CBT components and to our knowledge there are no previous published studies of acceptance-based behavior therapy for GAD delivered through the internet. There are however previous controlled studies on acceptance-based internet treatments, for example for depression (Carlbring et al., 2013), tinnitus (Hesser et al., 2012) and chronic pain (Buhman et al., 2013) showing promising effects. The rationale for developing a novel acceptance-based treatment for GAD was motivated by the mixed findings of ICBT in the Swedish trials and the need for a treatment that is less based on reading long texts.

The aim of the present study was to describe the appearance and functionality of a new acceptance-based internet-based treatment program for GAD and to conduct a pilot study. The study was part of a larger project ending up in a controlled trial that was performed after this study but published before (Dahlin et al., 2016). In contrast to the previous Swedish ICBT program Origo the internet-delivered acceptance-based behavior therapy program makes more use of the possibilities of modern technology including animations, audio and video to enhance the ways to present the treatment material.

2. Material and methods

2.1. Recruitment and inclusion

Participants were recruited and treated at two separate primary care clinics in Linköping, Sweden. Each primary care clinic had a licensed psychologist working at the clinic. The psychologists worked with face-to-face CBT as well as ICBT on daily basis and asked a selection of their patients if they were willing to take part in a pilot study. No advertising or other arrangements were made to recruit participants for the study. All were patients who had contacted the primary care clinic to get help with concerns regarding their psychological wellbeing and had an initial appointment with a physician. Following usual practice at the clinic, the general practitioner seeing patients presenting with anxiety or mood disorders did an initial clinical evaluation and referred the patient to the psychologist at the primary care clinic to work with the problems. At the first session the psychologist did a clinical diagnostic interview based on DSM-IV (American Psychiatric Association, 2000) to establish a primary diagnosis and discuss treatment options. During these initial sessions participants meeting the inclusion criteria were given the option to go through an internet-based treatment program for worry or receive face-to-face treatment. A total of 16 individuals

expressed their interest to participate in the study and receive the internet based treatment and gave informed consent. None of the participants had actively asked for this form of treatment before the psychologist brought up that treatment option.

Inclusion criteria used in the study were: (a) a primary diagnosis of GAD, (b) a minimum age of 18 years, (c) no other ongoing psychological treatment, (d) if medication were used, a stable use of the medication during treatment, (e) no use of benzodiazepines, (f) no alcohol or drug abuse, (g) a computer with internet connection. A written informed consent form was signed by all participants, stating that they agreed to take part in the study and that data was collected and used in publications. The study was part of a larger project that was approved by the local ethics committee.

2.2. Participants

Sixteen participants were initially recruited to the study. Two of these were later excluded. One was excluded because of use of benzodiazepines during treatment and the other did not start treatment. Of the fourteen participants finally included eleven were female (78.6%) and three male (21.4%). Mean age was 32 years (SD = 10.0, range 21 to 59 years).

2.3. Measures

The 16-item Penn State Worry Questionnaire (PSWQ; Meyer et al., 1990) was used as the main outcome measure. PSWQ is a questionnaire specifically developed to measure worry and has high internal consistency and good test-retest reliability. The 8-item Client Satisfaction Questionnaire (CSQ-8; Larsen et al., 1979) is a questionnaire designed to measure client satisfaction with the service given and hence gives an understanding of how satisfied the person is with the treatment received rather than treatment gains. CSQ-8 was used as a way to collect information regarding satisfaction with the treatment format.

2.4. Treatment

2.4.1. Description of the treatment program and online platform

The worry help program consists of seven episodes outlined in Table 1. The treatment is primarily based on functional analysis, acceptance, mindfulness and valued action and ultimately aims to help people take a more accepting approach to anxiety and worry as well as living in accordance to one's values instead of reacting with avoidance. Each episode consists of approximately 10 slides. A specific chapter in a workbook accompanies each online episode. The user is encouraged to use the workbook to write down how the work progresses and do specific exercises that are presented in the online episode. Some of the work in the workbook is done in front of the computer and other exercises are done in daily life. At the completion of the treatment the user will have the main components of his or her own treatment written down in the workbook and can go back to their treatment anytime he or she wants to regardless of whether or not they have an active code to the online program. An audio CD accompanies the workbook. The audio files are five exercises in mindfulness and acceptance. The use of an audio CD is based on the assumption that the user should be able to continue to work with the treatment even after the active online treatment program has ended.

Psychologists and web-developers worked together to develop the online treatment platform. The technical framework is based on knowledge and research on how people in general use websites provided by the web-developers, together with knowledge and research on behavioral principles for learning (operant and respondent conditioning) provided by clinical psychologist.

From the start two main concerns guided the development of the platform and the treatment program - usability and information delivery. Regarding the design of the platform we wanted it to be easily accessible,

Table 1
Outline of the modules in the treatment program and assignments in the workbook.

Episode	Online program	Assignments in the workbook
1	<i>What is worry?</i> An introduction to the whole program. Psychoeducation regarding worry and anxiety as well as a conceptualization of the treatment of GAD is presented.	Exploration of one's own thoughts about worry and how it has been handled up until now. The worry diary (frequency of worry, how it is handled and progress) that runs through the whole program is started.
2	<i>Functional analysis</i> Functional analysis is presented as a tool to understand one's own worry and anxiety.	Working with functional analysis of one's own anxiety, worry and actions associated with these.
3	<i>Values and activities</i> Values driven actions is presented as an alternative to anxiety driven actions.	Working with one's own values and creating action plans to take steps towards these both in the short-term as well as long-term
4	<i>To be mindfully present</i> Mindfulness is presented both theoretical and through a number of exercises.	Doing mindfulness exercises and evaluated these.
5	<i>Worry as a process</i> A deeper understanding of one's worry is outlined based on what the user has learnt so far and information about the nature of worry. Exposure and the option to invite one's thoughts and feelings instead of struggling against them are presented as an alternative to avoidance.	Continuing work with mindfulness and inviting thoughts and feelings as well as continued work with valued actions.
6	<i>Acceptance</i> Acceptance is presented and tied to the understanding from previous modules through different exercises.	Acceptance as an alternative to avoidance is incorporated in the ongoing work with mindfulness and valued action.
7	<i>What works best for you?</i> A summary of the treatment is presented and the user is encouraged to establish a plan on how to keep on working with the parts of the treatment that they thought worked for them.	The user develops a personal plan on how to keep on working with the treatment.

motivating to work with, comprehensible and easily navigated. It should preferably be utilizing media (i.e. movies and audio). Regarding the content and scope of the treatment program we wanted it to be less extensive in the amount of text that the client had to read as compared to our

previous ICBT program Origo. We also included different types of information by using video and audio as a way to deliver information and reduce the amount of text.

The solution developed was divided into two parts; a website and a printed workbook. The user receives a login code for the website www.oroshjalpen.se in order to get access to the program, *The worry help* (Oroshjälpen®). At the first visit, the user is greeted by a video with a psychologist describing the program and what can be expected when working with it. The psychologist then returns in other episodes of the program. After seeing the introduction video, the user is directed to the menu page (main section) of the website (see Fig. 1). The menu is the landing page for the user as he or she logs on the website (except for the first time visit). The menu page also contains an animation with seven clouds on top of a sun. For every episode the user finishes, a cloud is slowly removed when the user logs in the next time. After having completed all seven episodes, all clouds are removed and only the sun remains. This is developed as a way of giving graphic feedback to remind the user of what he or she has completed so far, and thus creating a boost in confidence.

From the landing page the user can go to any of the seven episodes of the program, Frequently asked questions (FAQ), Settings or Registrations. *FAQ* is where the most common questions about the program have been gathered. *Settings* is where the user can turn some of the most basic settings off or on. This includes voice over, sound, pop-ups and full screen. *Registrations* is where the user can follow the registrations done in each episode of the program. The worry help contains four different registrations: level of worry, anxiety, muscle tension and life quality. The registrations are presented in four different diagrams with different colors.

The user starts the worry help by pressing the "Start"-button. This button changes to "Continue" after the first episode has begun. The website always remembers where the user was last when the website was shut down, which means that the user can always be directed immediately to the part of the program he or she was last working on.

The program then directs the user to an overview page of the episode (Fig. 2). The user can visually see the pages that he or she is going to work with during this episode. It also contains a short summary of the content of the specific episode. This way of introducing each episode enables the user to easily understand what is going to happen in the episode and how many slides he or she has to take part of. The user then presses, "Continue" to move on to work with the specific episode.



Fig. 1. Menu page.

Every episode contains a specific number of slides, ranging from 8 to 10 slides per episode. Each slide can contain text (with voice over), video, audio, pictures and slideshows. The user can choose to listen to, or pause, the voice over while reading. This was developed to handle different preferences regarding information gathering as well as for patients having problems reading text as part of having difficulties concentrating. Videos depict the psychologist and a “patient” that the user follows at different times in the program. The many ways of presenting the material were implemented to increase motivation and activate the user. There is also a function called “Star marking” that can be used to mark certain slides in the program that the user rates as extra interesting and needs quick access to. This is done in the same way as being used by web browsers and a behavior already known for most users.

Each episode has a fixed order. The user has to go through the slides from the first one and onwards. There is only one mandatory behavior to move forward from each episode and that is the registration of anxiety, worry, life quality and muscle tension. The program contains positive feedback making interacting with the program rewarding for the user.

There are three ways for the user to move back or forward in each episode. Move the triangle, press the white square or press one of the arrows (see Fig. 3). The reason for this is that different user styles are accounted for and therefore minimizes the risk that the user gets stuck in the beginning of the program if he or she chooses not to watch the tutorial.

The website is created so that if the user presses the “back” button of the web browser it takes one step back to the latest page on the website and not back to the previous website. Users can also always go back to the menu by using the Menu tab in the upper part of the screen. The user can choose to work in full screen mode. The reason for this is to remove distractions from other websites and get the user fully concentrated on the treatment program.

Another part of the online delivery platform is a therapist function. The therapist can log on to the platform and monitor the patient's progress through the program. The therapist can see when and how often the patient logs on to the program, the patient's online registrations for each episode and how many episodes the patient has worked with.

2.4.2. How the treatment was delivered in the pilot study

In the first session (same as when the participants were diagnosed with GAD) the participants were given instructions about the treatment program and how to go through the treatment. Participants had 8–10 weeks to complete the seven episodes of the treatment, and were informed that an appropriate work pace would be to complete one episode per week, and to go through the episodes in a specific predetermined order. They were also encouraged to schedule 30–45 min per episode and week to work with the program. Finally they were instructed to contact the psychologist at least once a week via email to give a short rapport of how the work was progressing and if they had any problems or concerns regarding the treatment. They were also informed that they would receive an answer within 48 h from the psychologist who would give feedback on the work and help the patient solve problems with the treatment should they occur. These instructions were given both verbally and written. In addition, one or two telephone contacts of 15 min duration were scheduled during the treatment period and a live session at the end of treatment.

Psychologists were instructed to monitor the participant's progress in the program and to be proactive, meaning that they should actively contact the participant if they did not hear from them in one week's time or if they did not see any activity in the program. Instructions regarding feedback on participants' e-mails were to keep the feedback short and if possible refer to the program, help participants with active problem solving if they were stuck or did not understand some part of the program and finally to validate the work and struggles participants reported.

The decision to include weekly contact with the participants during the treatment was based on previous studies showing that contact boosts adherence (Baumeister et al., 2014).

2.5. Statistical analyses

Within-samples *t*-test was used to analyze changes in pre- to post and follow-up scores on the PSWQ, using the conventional $p < 0.05$ level. Within group effect sizes (Cohen's *d*) were calculated by taking the average change score of pre-, post and follow-up on PSWQ for each individual divided by the average standard deviation.

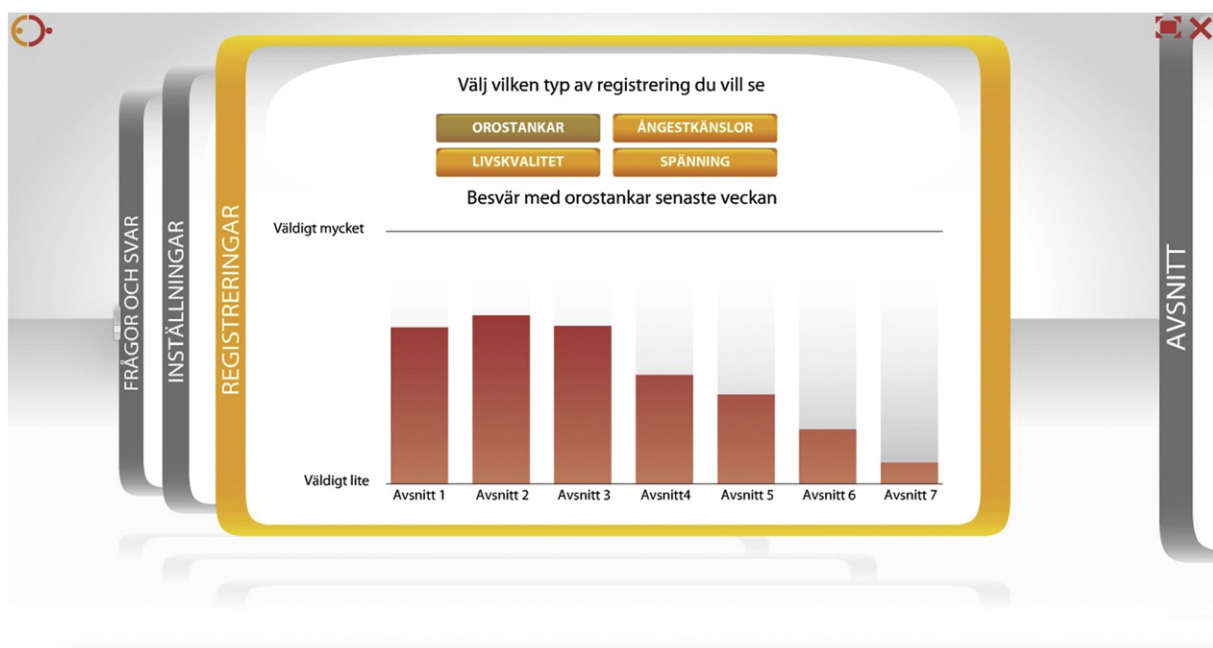


Fig. 2. Overview of registrations.



Fig. 3. In program registrations.

3. Results

3.1. Measure and diagnosis

In Table 2 mean scores on PSWQ at pre, post and follow up are presented. Paired sample *t*-tests showed significant differences between pre and post scores $t(13) = 5.8$ $p < 0.0001$. Within-group effect size between pre and post measure was $d = 2.14$, which is a large effect. Follow-up data were collected from 10 participants at two to three months after the treatment had ended. Paired *t*-test did not show a significant difference between post and follow up scores $t(9) = 0.030$, $p < 0.77$, indicating that the treatment effects were maintained.

At inclusion all patients met the diagnostic criteria for GAD (DSM-IV) and at post measure and follow up 20% were diagnosed with GAD in a clinical interview performed by the treating psychologist. This is significant difference, Fischer exact test ($p = 0.001$). Follow-up data were collected from 10 participants two to three months after treatment had ended. At follow up the same participants who suffered from GAD at end of treatment still met diagnostic criteria for the disorder.

3.2. Adherence

All participants ($n = 14$) completed all modules during the treatment. Table 3 gives an overview of how the treatment was used. Due to a misunderstanding adherence data were only available from 9 participants.

Table 2
Mean within-group scores (standard deviation) and effect size on PSWQ at pre, post and follow up.

Questionnaire	Time of assessment	N	M (SD)	Cohen's <i>d</i> CI 95%
PSWQ	Pre	14	66.43 (5.30)	2.14 1.05–2.85
	Post	14	48.14 (11.72)	
	2–3 months follow up	10	47.6 (12.35)	

PSWQ = Penn State Worry Questionnaire.

3.3. Client satisfaction

At the follow up two to three months after treatment ended nine participants filled out CSQ as a way to collect information on how satisfied the participants was with the treatment format. Mean score on CSQ was 20.78 (range 17 to 24, SD = 2.63), indicating high satisfaction.

4. Discussion

The aims of the present pilot study were to describe and then evaluate a newly developed internet-based acceptance-based behavior therapy for GAD. Results showed that the within-group effect on the PSWQ was in line with previous studies on ICBT for GAD (Andersson, 2016). Although the data collected in this pilot study were limited with a small sample it gives a preliminary indication that a treatment program based on acceptance, mindfulness and valued action, delivered through the internet, can be effective in reducing worry for patients suffering from GAD. This finding was corroborated by our subsequent RCT (Dahlin et al., 2016). To our knowledge this is one of the first studies on internet-delivered acceptance-based behavior therapy for GAD, but previous studies for other conditions have found promising effects as well, for example for tinnitus (Hesser et al., 2012), chronic pain (Buhrman et al., 2013) and depression (Carlbring et al., 2013; Lappalainen et al., 2014).

A strength of this study is that we used a consecutive intake in routine care. None of the participants actively sought this form of treatment or to take part in a study. Thus the pilot study was tested in

Table 3
Treatment variables ($n = 9$).

Variable	M (SD)
Treatment duration (days)	103.1 (40.4)
Times logged in to program	12.1 (4.1)
Minutes spent working with program	298.4 (120.7)
Live sessions during treatment	0.8 (0.8)
Number of mails participants sent	8.8 (3.3)
Number of mails participants received	9.4 (4.0)

similar setting as an effectiveness study (Andersson and Hedman, 2013). However, we cannot claim that the treatment was part of routine care. The second aim was to investigate if the treatment platform was acceptable to patients. All participants in the study completed the whole treatment program. They also reported to be satisfied with the treatment. This indicates that the format and delivery of the treatment are acceptable for patients in routine care.

There are of course a number of weaknesses with this pilot study. Given the small sample and lack of control condition the results should be interpreted with caution. Without a control condition it is impossible to be certain that the effects shown in this study are actual effects of the treatment program and not a result from other sources affecting the participants. However, given the chronic nature of GAD it is not likely that the effects reflect only spontaneous recovery. The results should only be interpreted as positive indications to further investigate this treatment in more rigorous controlled trials. Such controlled study was recently completed (Dahlin et al., 2016). Another weakness was that the two psychologists delivering the treatment also did the initial and follow-up interviews as well as collected the self-report measures. This can of course lead to a bias in data collection. Finally we only used one standardized measure and a clinical interview to evaluate the treatment. Although PSWQ is a widely used and reliable measure it gives a limited amount of data. Despite these limitations this small pilot study gives us an indication that GAD can be treated via developed internet-based acceptance-based behavior therapy and calls for further testing in larger samples.

Conflict of interest

Mats Dahlin, Kristofer Vernmark and Marielle Ryberg are employed at Psykolopartners AB which is the company that have developed the treatment program used in this study. The other authors have no conflict of interest.

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