Journal of Anxiety Disorders 27 (2013) 461–468

Contents lists available at SciVerse ScienceDirect

Journal of Anxiety Disorders

Acceptance and commitment group therapy for health anxiety – Results from a pilot study

T. Eilenberg, L. Kronstrand, P. Fink, L. Frostholm*

The Research Clinic for Functional Disorders and Psychosomatics, Aarhus University Hospital, Barthsgade 5.1, 8200 Aarhus N, Denmark

ARTICLE INFO

Article history:
Received 31 August 2012
Received in revised form 3 May 2013
Accepted 1 June 2013

Keywords:
Health anxiety
Hypochondriasis
Acceptance and Commitment Therapy
Somatization
Illness perception

ABSTRACT

Health anxiety (or hypochondriasis) is prevalent, may be persistent and disabling for the sufferers and associated with high societal costs. Acceptance and Commitment Therapy (ACT) is a new third-wave behavioral cognitive therapy that has not yet been tested in health anxiety.

34 consecutive Danish patients with severe health anxiety were referred from general practitioners or hospital departments and received a ten-session ACT group therapy. Patients were followed up by questionnaires for 6 months.

There were significant reductions in health anxiety, somatic symptoms and emotional distress at 6 months compared to baseline: a 49% reduction in health anxiety (Whiteley-7 Index), a 47% decrease in emotional distress (SCL-8), and a 40% decrease in somatic symptoms (SCL-90R Somatization Subscale). The patients' emotional representations and perception of the consequences of their illness (IPQ) improved significantly, and 87% of the patients were very or extremely satisfied with the treatment.

1. Introduction

Health anxiety or hypochondriasis is common with a prevalence of 0.8–9.5% in primary care (Creed & Barsky, 2004; Fink, Ørnbøl, & Christensen, 2010; Fink, Ørnbøl, Toft et al., 2004; Gureje, Ustun, & Simon, 1997), and spontaneous remission is rare in severely ill patients (Fink et al., 2010; Fink et al., 2004b). Health anxiety is seldom diagnosed and has traditionally been considered a chronic disorder that is difficult to treat (Barsky & Ahern, 2004). Health anxiety and hypochondriasis are often classified in different ways, and in this study, we have used the empirically established positive criteria for health anxiety published by Fink et al. 2004b. The essential features of health anxiety are exaggerated rumination with intrusive worries about harboring a serious illness and persistent preoccupation with ones health leading to significant decrease in health-related quality of life. Thus, health anxiety is mainly characterized by cognitive and emotional symptoms, which distinguishes it markedly from other somatoform disorders.

Psychotherapeutic treatments of health anxiety have primarily used various forms of cognitive behavioral therapies (CBTs) (Thomson & Page, 2007). Previous randomized, controlled trials (RCTs) have shown that treatments such as explanatory therapy (Fava, Grandi, Rafanelli, Fabbri, & Cazzaro, 2000), cognitive therapy (Greeven et al., 2007; Visser & Bouman, 2001), cognitive behavioral therapy (CBT) (Barsky & Ahern, 2004; Clark et al., 1998; Sorensen, Birket-Smith, Wattar, Buemann, & Salkovskis, 2010; Warwick, Clarke, Cobb, & Salkovskis, 1996) and mindfulness-based cognitive therapy (MBCT) (McManus, Surawy, Muse, Vazquez-Montes, & Williams, 2012) are associated with decrease in symptoms of health anxiety.

Central to cognitive models of health anxiety is that patients with health anxiety have negative beliefs about health and illness and therefore misinterpret common symptoms as a sign of undiagnosed serious illness (Abramowitz, Schwartz, & Whiteside, 2002; Marcus & Church, 2003).

Since these misinterpretations entail physiological arousal and anxiety that may further intensify the physical sensations and worries, the focus in traditional CBT is on breaking this "vicious circle". CBT specifically aims at challenging the content of the dysfunctional beliefs, conducting behavioral experiments, graded exposure, and possibly relaxation training.

However, a new generation of cognitive behavioral treatment methods commonly called "the third wave" is less focused on changing the form or frequency of inner experiences such as symptoms, but rather seeks to change the patients' way of relating to the experience. Acceptance and Commitment Therapy (ACT) is one of the new third wave therapies. The overall aim of ACT is to increase "psychological flexibility" defined as the ability to know and act upon personal life values, even when faced with difficult thoughts, emotions, and bodily sensations. Therefore, for example mindfulness is used to increase the individual's ability to recognize and gently allow unwanted inner experiences, rather than

* Corresponding author. Tel.: +45 78464334; fax: +45 78464340.
E-mail address: lisfro@rm.dk (L. Frostholm).

0887-6185/$ – see front matter © 2013 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.janxdis.2013.06.001

suppressing, controlling, or ruminating about these. The human tendency of wanting to control or get rid of difficult thoughts, feelings, and sensations is called "experiential avoidance" in ACT terms and is assumed to be a key element in the development of psychological pathology (Fledderus, Bohlmeijer, & Pieterse, 2010; Hayes, Villatte, Levin, & Hildebrandt, 2011).

Third wave therapies are gaining more and more attention, both in research and clinical practice (Hofmann, Sawyer, & Fang, 2010; Ost, 2008). It is found that RCTs on ACT have an overall moderately strong effect size (Ost, 2008). ACT has not yet been tested in patients with health anxiety, but has shown a positive effect in the treatment of a range of disorders, among others depression, anxiety disorders, chronic pain, drug abuse, and psychotic symptoms (Bach, Hayes, & Gallop, 2011; Dahl, Wilson, & Nilsson, 2004; Dalrymple & Herbert, 2007; Forman, Herbert, Moitra, Yeomans, & Geller, 2007; Lundgren, Dahl, Melin, & Kies, 2006; Lundgren, Dahl, & Hayes, 2008; Lundgren, Dahl, Yardi, & Melin, 2008; Pull, 2009; Twohig, Hayes, & Masuda, 2006; Zettle & Rains, 1989; Zettle, 2003).

There are reasons to hypothesize that ACT may be applicable in the treatment of health anxiety as health anxiety phenomenologically is similar to anxiety disorders in some aspects, e.g. dysfunctional cognitions and rumination leading to misinterpretations of internal or external cues resulting in anxiety (Taylor & Asmundson, 2004). ACT has been applied specifically in RCTs on anxiety disorders, e.g. OCD (Twohig et al., 2010) and mixed anxiety disorders (Arch et al., 2012a; Forman et al., 2007) providing preliminary evidence that ACT may be an effective treatment for anxiety disorders. Furthermore, authors have stressed a relationship between anxiety sensitivity and the ACT term "experiential avoidance" (Arch, Wolitzky-Taylor, Eifert, & Craske, 2012; Berman, Wheaton, McGrath, & Abramowitz, 2010).

In this uncontrolled pilot study, we wished to examine the effect and acceptability of ACT group therapy on severe health anxiety as well as assess the study design in terms of assessment procedure, outcome measure, and treatment manual before initiating a randomized, controlled trial.

We hypothesize that for patients with severe health anxiety, ACT group therapy is (1) associated with significant reductions in self-reported health anxiety symptoms, somatic symptoms, and emotional distress 6 months after treatment compared to before treatment, (2) acceptable, and (3) associated with significant improvements in the patients' illness perceptions 6 months after treatment compared to before treatment.

2. Methods

2.1. Subjects and setting

This study was carried out at the Research Clinic for Functional Disorders and Psychosomatics, Aarhus University Hospital, Denmark. Information about the study (e.g. referral procedure and inclusion and exclusion criteria) was sent to general practitioners in the catchment area and was also available on the clinic's webpage. Treatment was free of charge for the patients, and they did not receive compensation for participation. Patients were consecutively referred from general practitioners or hospital departments. Between April 2009 and May 2010, patients referred to the clinic were screened for study eligibility (Fig. 1). Patients were invited to undergo a thorough clinical assessment using a modified version of the semi-structured psychiatric interview, Schedules for Clinical Assessment in Neuropsychiatry (SCAN) (WHO, 1998; Fink, Ørnbøl, Toft et al., 2004) performed by either a psychologist or a medical doctor. Psychologists consulted a medical doctor in case of unclear medical history. The eligibility criteria were: (1) the Whiteley-7 Index (scale 0–100 score points) score >21.4, (2) severe health anxiety (Fink, Ørnbøl, Toft et al., 2004), (3) 20–60 years old, (4) of Scandinavian origin, and (5) in case of comorbid mental disorder, health anxiety is dominant. Patients were excluded if they (1) were at risk for suicide, (2) had current or previous episodes of psychosis, (3) had abuse of alcohol, drugs, or medication, (4) were pregnant, or (5) did not give informed consent to the study.

2.2. Study design and measures

Patients completed questionnaires at baseline, at the end of treatment, and at 3- and 6-month follow-up.

2.2.1. Primary outcome

The primary outcome measure was the Whiteley-7 Index (Fink et al., 1999) – a 7-item measure on symptoms of health anxiety. The Whiteley Index (WI) has been widely used in assessing health anxiety and has demonstrated excellent psychometric properties in primary care samples with good sensitivity and specificity for screening DSM-IV somatiztion disorder and hypochondriasis/health anxiety (Conradt, Cavanagh, Franklin, & Rief, 2006; Fink et al., 1999).

Each item on the WI was Likert scored from 1 to 5, and the patients' scores are shown as a sum score of these seven ratings. Scores were transformed from a 7–35 score point scale to a 0–100 score point scale (a higher score indicating more symptoms) to facilitate comparison with other studies using another version of WI.

The WI does not have a clearly defined cut-off in terms of identifying clinical cases. Therefore, the cut-off score >21.4 was established based on data from a primary care follow-up study on health anxiety. The study showed that at 24-month follow-up, 10% (the 90% percentile) of the patients with a well-defined medical condition had a Whiteley-7 score above 21.4 (scale 0–100 score points) (Fink et al., 2010).[1] We therefore chose this as the upper limit for natural worry about illness in a medical population and on this background defined patients scoring above this cut point as potential cases of health anxiety.

Furthermore, response status on the WI was determined according to the criteria of clinically significant improvement (Jacobsen & Truax, 1991). A clinically significant improvement was defined as an SD for change equivalent to 25 score points (scale 0–100 score points). The SD of the changes was assessed based on existing data from the clinic and has shown to vary quite a lot ranging from 15 to 25 (Fink et al., 2010). We have thus chosen a quite conservative estimate for the SD.

2.2.2. Secondary outcome

Secondary outcome measures were severity of anxiety and depression measured with the SCL-8 scale (Fink et al., 2004a), physical symptoms measured with the SCL-90-R Somatization Subscale (Derogatis & Cleary, 1977), and illness perception measured with a Danish condensed version of the Illness Perception Questionnaire (IPQ) (Frostholm, Fink, Christensen et al., 2005; Frostholm, Fink, Oernboel et al., 2005; Frostholm et al., 2007). Four components of the IPQ hypothesized to be important in health anxiety were included: Negative consequences (e.g. 'My illness will have negative consequences for how I perceive myself'), Uncertainty (e.g. 'It is hard to figure out what's wrong'), Long timeline perspective (e.g. "my symptom are a sign of a long-lasting illness"), and negative emotional representations (e.g. "My illness makes me feel depressed").

[1] Further information on how the cut-off score for the WI was established can be obtained from the corresponding author.

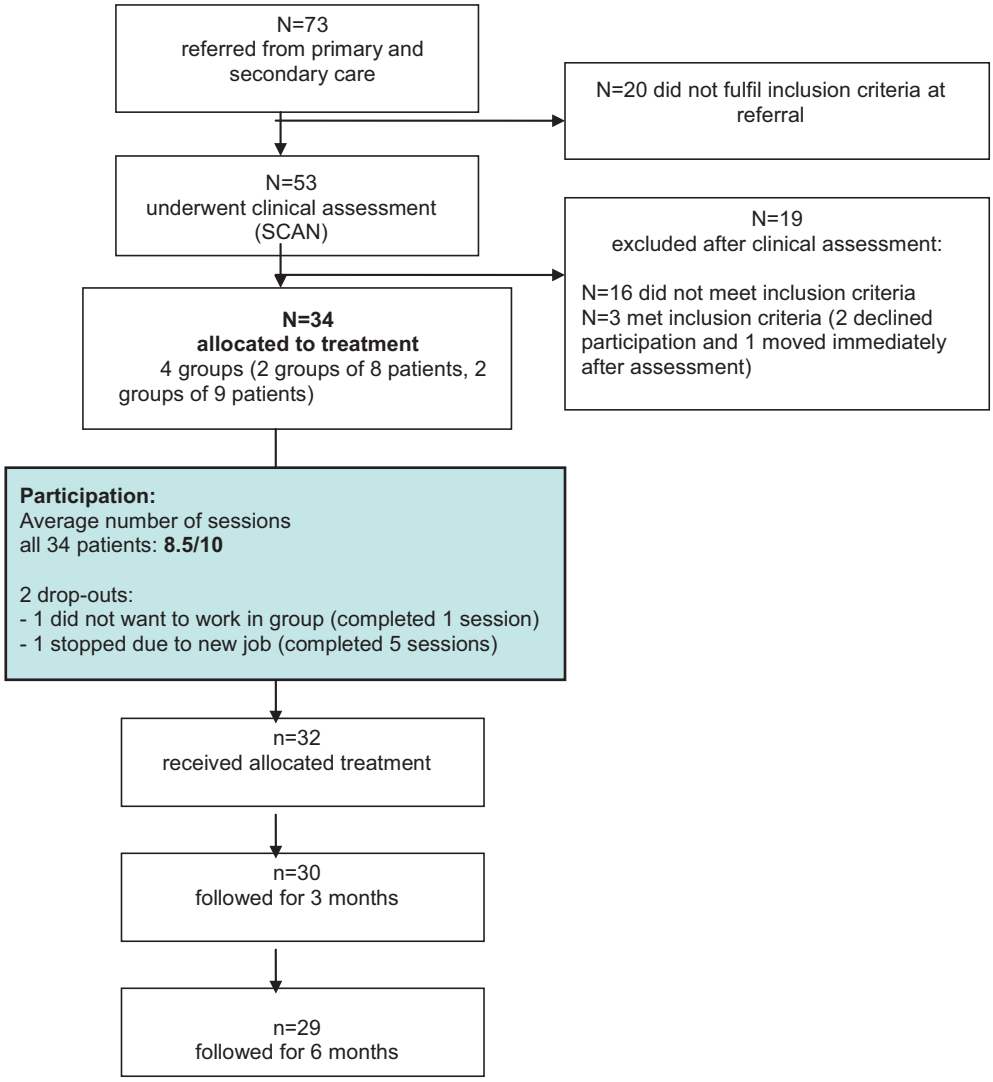

Fig. 1. Subject flow from referral through 6-month follow-up.

All scales were converted into scale 0–100 score points (high score = many symptoms).

2.2.3. *Patient satisfaction and evaluation*

To examine acceptability of the format and the content of the sessions, the following single-item questions on patient satisfaction and evaluation of the treatment were used: (1) "How satisfied are you with the treatment offered?" Not at all/A little/Some/A lot/Extremely. (2) "To which extent would you recommend this treatment to a friend?" Not at all/A little/Some/A lot/Extremely. (3) "The treatment helped me get better?" True/Predominantly true/Predominantly wrong/Wrong. (4) "The treatment has increased my quality of life?" True/Predominantly true/Predominantly wrong/Wrong.

2.3. *The intervention*

Patients were treated in groups of 8 or 9 at a university hospital clinic, and the treatment was carried out by 2 psychologists who had completed training in ACT and received ongoing supervision in ACT by experienced ACT therapists. The group therapy included 9 weekly sessions of 3.5 h and a booster session 1 month after the 9th session, a total of 35 h including breaks.

The participants were encouraged to spend time between sessions on homework, including mindfulness exercises. If a participant experienced problems during treatment that were beyond the scope of the group, a supplementary individual session was offered (1 patient received 2 individual sessions).

A detailed treatment manual, inspired by pre-existing ACT manuals (Dahl, Wilson, Luciano, & Hayes, 2005; Eifert & Forsyth, 2005; Hayes, Strosahl, & Wilson, 1999; Zettle, 2007), had been prepared for each session with an overall theme (Fig. 2). Each session included at least 1 mindfulness exercise, psychoeducation, discussion, experiential exercises and/or work in groups, and introduction to homework. Most of the mindfulness exercises were short (5–15 min.), many of which included visualization and guided questions. Patients received a ring binder and hand-outs at each session. They were given a CD with mindfulness exercises in session 1.

The first 3 sessions focused on exploring the workability of the individuals' control and avoidance strategies toward health anxiety symptoms; the overall aim being to commit the patients to alternative behaviors and thereby foster action toward living a full and meaningful life rather than a controlled and restricted life. Session 4 was dedicated to clarifying that one has a choice between controlling anxiety or living according to chosen values. Sessions 5–7 aimed at exploring new ways to relate to troublesome thoughts,

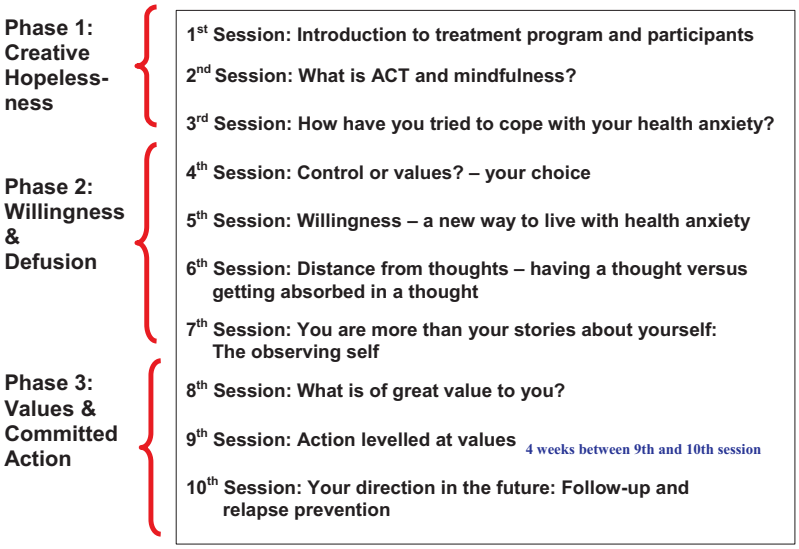

Fig. 2. Manual outline. 10 sessions with individual themes. Divided up into three phases with overall focus point.

feelings and bodily sensations, focusing on acceptance as opposed to control strategies. The main emphasis of the final sessions were further clarification of personal values and commitment to realistic goals in the presence of unwanted inner experiences.

After the therapists had tried out the manual, some changes were made; mainly that the focus on clarifying personal values and dedicated action was introduced earlier in the treatment, and, in general, psychoeducation was reduced in favor of experiential exercises and feedback from patients.

2.4. Statistical methods

Means and standard deviations were computed for all questionnaires at baseline, end of treatment, and at 3- and 6-month follow-up. Due to the skewed distribution of most measures and the sample size, non-parametric statistics were used. Since we have repeated measurements on each patient, a non-parametric version of repeated measures ANOVAs, such as the Friedman Test, would be an option. However, due to the small number of patients and attrition of data, we used the Skilling–Mack Test, which is a generalization of the Friedman Test that specifically addresses these problems (Chatfield & Mander, 2009).

3. Results

3.1. Subjects

Of 73 consecutively referred patients screened for eligibility, 20 did not meet inclusion criteria (Fig. 1). Of the 53 patients undergoing clinical assessment, 19 were excluded after assessment (16 did not meet inclusion criteria, 2 declined participation and 1 moved), leaving 34 patients allocated to treatment. Two of those 34 patients dropped out during treatment. End of treatment data were available for 32 patients (94%), 3-month follow-up data for 30 patients (88%), and 6-month follow-up data were available for 29 patients (85%).

3.2. Baseline characteristics

The mean age of participating patients was 38 years (25–52), and 25 (74%) of the participating patients were female (Table 1). All participants had finished primary and lower secondary school for 7–16-year-olds. The majority of the group (91%) was living with a partner. Furthermore, 56% ($n = 19$) had a comorbid disorder, the most common being an anxiety disorder (32%). Participants reported a history of health anxiety symptoms of 10 years on average. Also, almost half of the participants ($n = 14$) reported a family history (parent or sibling) of health anxiety (Table 1).

3.3. Outcomes

Patients reported statistically significant reductions in health anxiety symptoms measured by the Whiteley-7 Index (Skilling–Mack test 42.3, $p < 0.0001$) (Table 2). In average, patients had a mean (SD) pre-treatment Whiteley-7 Index score of 67.2(26.8) and a mean (SD) post-treatment score of 40.6(26.0). The effect was sustained and even further increased at 6-month

Table 1
Baseline demographics.

	Percentage (n)
Gender	
Male	26% (9)
Female	74% (25)
Living status	
Alone	9% (3)
With someone	91% (31)
Further education[a]	100% (34)
Work status	
Working	70% (24)
Sick leave	15% (5)
Pension or cash benefits	15% (5)
Comorbid diagnoses	56% (19)
Anxiety disorder	32% (11)
Depressive disorder	18% (6)
Severe BDS[b]	26% (9)
Family history of health anxiety	41% (14)
Health anxiety duration in years	mean 10 (range 2–35)
Age	mean 38 (range 25–52)

[a] Attended further education after finishing primary and lower secondary school for 7- to 16-year-olds.

[b] Epidemiological and neurobiological studies suggest that the functional somatic syndromes, e.g. fibromyalgia, chronic fatigue syndrome, irritable bowel syndrome and somatoform disorders belong to the same family of disorders. An empirically based diagnosis including different subtypes and severities is proposed as a unifying diagnostic construct: Bodily distress syndrome. This construct provides a common language for functional disorders across medical specialties (Fink & Schröder, 2010).

Table 2
Outcome measures at baseline, end of treatment, 3- and 6-month follow-up.

Measures (scale 0–100 score points)	Base-line (T1) ($n = 34$)		End of treatment (T2) ($n = 32$)		% change T1 – T2	3-Month follow-up (T3) ($n = 30$)		% change T1 – T3	6-Month follow-up (T4) ($n = 29$)		% change T1 – T4	Skilling–Mack statistic, bootstrap empirical p-value (ties)
	Mean	S.D.	Mean	S.D.		Mean	S.D.		Mean	S.D.		
Health anxiety (Whiteley-7 Index)	67.2	26.8	40.6	26.0	−40%	33.8	26.1	−50%	34.5	26.9	−49%	SM = 42.3 $p < 0.0001$
Somatic symptoms (SCL-90-R-som)	37.0	21.4	30.2	21.2	−18%	23.5	20.7	−36%	22.1	16.1	−40%	SM = 30.6 $p < 0.0001$
Emotional distress (SCL-8)	46.6	24.5	30.6	24.2	−34%	27.0	25.0	−42%	24.8	21.1	−47%	SM = 26.0 $p < 0.0001$
Illness perceptions (IPQ)												
Consequences	58.5	28.8	53.3	31.2	−9%	42.8	23.6	−27%	39.7	29.3	−32%	SM = 18.3 $p < 0.0001$
Uncertainty	61.6	33.7	51.2	29.2	−17%	43.0	38.1	−30%	39.9	35.5	−35%	SM = 3.7 $p = 0.2050$
Long Timeline	75.3	22.5	70.2	25.3	−7%	64.2	30.8	−15%	59.5	31.1	−21%	SM = 5.0 $p = 0.068$
Emotional Representations	71.5	18.5	55.4	23.8	−23%	56.0	28.9	−22%	50.3	28.0	−30%	SM = 21.8 $p < 0.0001$

Fig. 3. Mean outcome on health anxiety, somatic symptoms and emotional distress.

follow-up, mean (SD) = 34.5(26.9), all in all a 49% reduction in health anxiety symptoms from pre-treatment to 6-month follow-up (Fig. 3 and Table 2).

At 6-month follow-up 34% ($10/29 \times 100$) of the patients had a Whiteley-7 score below the cut off score (<21.4, scale 0–100 score points) and 79% ($23/29 \times 100$) of the patients had a minimum change of 25 score point on the Whiteley-7 (responders).

In both emotional distress (SCL-8) and somatic symptoms (SCL-90-R somatization subscale), the same pattern was observed as for health anxiety; a 47% reduction in emotional distress and a 40% reduction in somatic symptoms respectively from pre-treatment to 6-month follow-up.

With respect to the four illness perception components, statistically significant improvements were observed for emotional representations and consequences (Fig. 4 and Table 2).

A two-sample Wilcoxon rank-sum (Mann–Whitney) non-parametric test of differences between 6- month follow-up and baseline on the primary outcome for patients with or without comorbidity showed no significant differences between the two groups, ($Z = -0.02$, $p = 0.98$).

Fig. 4. Mean outcome on four components of patients' perceptions of their illness on the Illness Perception Questionnaire. An adapted and condensed version of the Illness Perception Questionnaire was used (see Methods for further details).

3.4. Patient satisfaction and evaluation

The median of attendance was 9 sessions with an interquartile range of 2. Patients reported high levels of satisfaction at end of treatment: 87.5% ($n = 28$) of the patients were extremely or very satisfied with treatment, 84.4% ($n = 27$) would recommend the treatment to a friend, 87.5% ($n = 28$) found that the treatment helped them get better, and 78.1% ($n = 25$) found that the treatment had improved their quality of life.

4. Discussion

This uncontrolled pilot study of Acceptance and Commitment Group Therapy (ACT) for severe health anxiety demonstrated statistically significant reductions in self-reported health anxiety, somatic symptoms, and emotional distress. Results were sustained and further improvements observed at 3- and 6-month follow-up compared to baseline: A 49% reduction in the main outcome of health anxiety symptoms was reported from pre-treatment to 6-month follow-up. Furthermore, ACT delivered in a group format appears to be an acceptable and feasible treatment for patients with health anxiety; as much as 78% of the patients found that the treatment had improved their quality of life and very few patients dropped out.

Robust evidence has been established, in accordance with a CBT understanding, that negative illness beliefs are associated with worse health outcomes across a range of illnesses (Frostholm, Fink, Christensen et al., 2005; Frostholm et al., 2010; Petrie & Weinman, 2006).

As previously discussed, the methods used in ACT are not directly targeted at eliminating negative illness perceptions, but rather to enhance the ability to experience anxiety provoking thoughts without having to control them. Since attempts to control illness perceptions were not actively reinforced, one could expect that illness beliefs would not change, or perhaps even increase. However, we observed significant improvements in negative perceptions of illness during the follow-up period, suggesting that ACT may lead to changes in cognitive perceptions of illness. This is promising as intrusive thoughts about harboring a serious illness is the defining feature of health anxiety.

Further research is required to determine how illness beliefs may change and whether they mediate symptom reduction or are a result of symptom reduction in ACT interventions. Also, future research and meditational analyses are needed to examine more systematically the relationship between changes in health anxiety and changes in suggested core ACT processes such as psychological flexibility and mindfulness.

The positive outcomes reported should be viewed within the limitations of the study, but seem comparable to results from the only 3 existing randomized controlled treatment studies for severe health anxiety using the Whiteley Index as primary outcome measure (Barsky & Ahern, 2004; Greeven et al., 2009, 2007; McManus et al., 2012).

It has been shown that comorbidity is high in this patient group, Greeven reporting between 25 and 51% comorbid psychiatric diagnoses in their sample (Greeven et al., 2009). Furthermore, as reported in other studies on health anxiety (Barsky & Ahern, 2004; Greeven et al., 2009), we found our pilot sample to have a mean duration of health anxiety complaints of 10 years. Analyses for patients with and without comorbidity showed that among our patients, improvements on the primary outcome were independent of whether the patients had comorbidity or not. In respect to these findings, previous studies have found that although there appeared to be a positive and significant correlation between comorbidity and health anxiety complaints at follow-up, comorbidity did not predict the course of health anxiety symptoms during the follow-up period (Fink et al., 2010; Greeven et al., 2009).

Comparisons of the results on the primary outcome (WI) of this pilot study with other studies can only be made with precaution given that our study is an uncontrolled pilot study. Converting Greeven et al.'s results on the Whiteley Index to a comparable 0–100 score scale, results very similar to those found in our pilot study were shown. In the cognitive behavior therapy group, a 42% decrease from baseline to the 18-month naturalistic follow-up was reported (Greeven et al., 2009). Converting McManus et al.'s Whiteley outcome to a comparable 0–100 score scale showed a 27% decrease from baseline to 12-month follow-up in the intervention group (mindfulness-based cognitive group therapy) (McManus et al., 2012). In Barsky & Ahern's study, results on the Whiteley Index were reported as a mean score of the individual items with a score range from 1 to 5 (Barsky & Ahern, 2004). In the treatment group (individual CBT), they reported a 21% decrease from baseline to 6-month follow-up and a 26% decrease from baseline to 12-month follow-up on the Whiteley Index. When we converted our pilot results from a Whiteley-7 total sum score scale 0–100 to a mean score of the individual items with a score range from 1–5, we found a comparable 37% decrease from baseline to 6-month follow-up on the Whiteley Index.

All in all, the 49% reduction in the main outcome of health anxiety symptoms at 6-month follow-up in our pilot study seems promising.

Furthermore, at 6-month follow-up, we found that 34% of the patients no longer reported enough health anxiety symptoms to meet the inclusion criteria (a Whiteley-7 Index score >21.4). At end point, these patients had a Whiteley-7 Index score similar to 90% of patients with a well-defined medical condition in primary care (Fink et al., 2010), indicating that they are no longer clinical cases of health anxiety. Also, response status on the Whiteley-7 Index was determined according to the criteria of clinically significant improvement (Jacobsen & Truax, 1991) and in the pilot study defined as an estimate SD for change of 25. At 6-month follow-up, we found that 79% of the patients responded. In comparison, Greeven et al. found in their study that 45% of the CBT subjects responded compared with 30% in the paroxetine group and 14% in the placebo group (Greeven et al., 2007).

There are major weaknesses in this study. First of all, the uncontrolled single group design means that reductions in symptoms may to some extent be an expression of spontaneous remission and natural fluctuations in symptoms. In addition, the improvements observed could be due to unspecific factors such as attention, 'being taken care of' etc. Again, we do not have a control condition to answer those questions. However, Fink et al. found in a two-year follow-up study on health anxiety in primary care that the 7-item Whiteley Index scores of patients with severe health anxiety were surprisingly stable across time (Fink et al., 2010). Also, in Barsky & Ahern's study (Barsky & Ahern, 2004), only an 8.5% reduction in the Whiteley Index score was observed in the control group from baseline to 6-month follow-up.

Furthermore, the majority of existing RCTs on health anxiety have consisted of individual treatment. We chose a group format because it may be more cost-effective than individual treatment and entail benefits in terms of mutual support, validation, and interaction among group members given that ACT lends itself well to interactive process. Therapy sessions of 3.5 h may seem quite long. This is the standard session length at the clinic and has been well accepted by the patients in former studies at the clinic (some patients live far away from the clinic and therefore prefer longer but fewer sessions). Though, the session length is within the range (90 min to 3 h) recommended in ACT group treatment (Walser & Pistorello, 2004). Further studies are needed to examine whether the results are generalizable to formats with shorter sessions.

One of the aims of the pilot study was to assess and optimize the treatment manual, before conducting a full-scale RCT. This resulted in some changes during the pilot phase, which may have influenced the delivered treatment. Clinically, we experienced that reducing the didactic formats, such as psychoeducation, and increasing the emphasis on values and committed action in all sessions, heightened the patients' willingness to take dedicated action.

Second, a limitation is the reliance primarily on self-report measures of outcome. Only the measure of attendance can be said to be a quantitative outcome measure indicating the patients' acceptance of the treatment. Third, patients were encouraged to not seek other psychological treatment or start medication during the treatment period, but it was not an exclusion criterion (e.g. medication would be monitored by their general practitioner). In the follow-up period, there were no guidelines, and it is possible that additional treatment could have had an effect on the outcome, and it is recommended that future RCTs analyze for possible interferences.

A fourth limitation of the study is that therapist adherence to the treatment manual has not been monitored as we believed it to be beyond the scope of this uncontrolled study. The construct validity could be significantly improved by e.g. video recording the sessions and having independent therapists assessing a randomized selection for adherence. However, we believe that a strength in regard to the treatment fidelity, and hence the important aspect of whether the treatment conditions are implemented as intended, is the pre-existence of a detailed manualized program.

Finally, the sample size was rather small with a total of 34 patients allocated to treatment.

In spite of the critical remarks, the results from this uncontrolled pilot study lend preliminary support for the promising role of ACT group therapy as an effective, acceptable and feasible treatment method for patients with severe health anxiety.

Data were available for a large majority of patients during the 6-month follow-up period, increasing the likelihood that the observed reductions in health anxiety symptoms and other measures are a reflection of solid change. Furthermore, our results from the uncontrolled study may indicate that ACT is beneficial in reducing both health anxiety complaints and comorbid anxious and depressive symptoms, with symptoms further decreasing during the follow-up and reductions in health anxiety symptoms being independent of comorbidity.

Our current sample from the pilot study seems in several ways comparable to other studies on patients with severe health anxiety. This supports our confidence that our assessment procedure, treatment manual and measurement methods are valid and usable in a randomized, controlled trial.

Future randomized controlled studies are needed to investigate whether these positive outcomes are maintained over a longer period of time to gain a full picture of the efficacy of this treatment.

Funding sources

The study was funded by Ministry of Science Technology and Innovation.

The funding sources were not involved in the study design, in the data collection, in the analysis and interpretation of the data, in the writing of the article, or in the decision to submit the article for publication.

References

Abramowitz, J. S., Schwartz, S. A., & Whiteside, S. P. (2002). A contemporary conceptual model of hypochondriasis. *Mayo Clinic Proceedings*, *77*(12), 1323–1330. Retrieved from PM: 12479520.

Arch, J. J., Eifert, G. H., Davies, C., Vilardaga, J. C., Rose, R. D., & Craske, M. G. (2012). Randomized clinical trial of cognitive behavioral therapy (CBT) versus acceptance and commitment therapy (ACT) for mixed anxiety disorders. *Journal of Consulting and Clinical Psychology*,. Retrieved from PM: 22563639.

Arch, J. J., Wolitzky-Taylor, K. B., Eifert, G. H., & Craske, M. G. (2012). Longitudinal treatment mediation of traditional cognitive behavioral therapy and acceptance and commitment therapy for anxiety disorders. *Behaviour Research and Therapy*, *50*(7–8), 469–478. Retrieved from PM: 22659156.

Bach, P., Hayes, S. C., & Gallop, R. (2011). Long-term effects of brief acceptance and commitment therapy for psychosis. *Behavior Modification*,. Retrieved from PM: 22116935.

Barsky, A. J., & Ahern, D. K. (2004). Cognitive behavior therapy for hypochondriasis: a randomized controlled trial. *JAMA*, *291*(12), 1464–1470. Retrieved from PM: 15039413.

Berman, N. C., Wheaton, M. G., McGrath, P., & Abramowitz, J. S. (2010). Predicting anxiety: the role of experiential avoidance and anxiety sensitivity. *Journal of Anxiety Disorders*, *24*(1), 109–113. Retrieved from PM: 19819106.

Chatfield, M., & Mander, A. (2009). The Skillings-Mack test (Friedman test when there are missing data). *Stata Journal*, *9*(2), 299–305. Retrieved from PM: 19829764.

Clark, D. M., Salkovskis, P. M., Hackmann, A., Wells, A., Fennell, M., Ludgate, J., et al. (1998). Two psychological treatments for hypochondriasis. A randomised controlled trial. *British Journal of Psychiatry*, *173*, 218–225. Retrieved from PM: 9926097.

Conradt, M., Cavanagh, M., Franklin, J., & Rief, W. (2006). Dimensionality of the Whiteley Index: assessment of hypochondriasis in an Australian sample of primary care patients. *Journal of Psychosomatic Research*, *60*(2), 137–143. Retrieved from PM: 16439266.

Creed, F., & Barsky, A. (2004). A systematic review of the epidemiology of somatisation disorder and hypochondriasis. *Journal of Psychosomatic Research*, *56*(4), 391–408. Retrieved from PM: 15094023.

Dahl, J., Wilson, K. G., Luciano, C., & Hayes, S. C. (2005). *Acceptance and Commitment Therapy for Chronic Pain*. Reno, USA: Context Press. Ref Type: Generic.

Dahl, J., Wilson, K. G., & Nilsson, A. (2004). Acceptance and commitment therapy and the treatment of persons at risk for long-term disability resulting from stress and pain symptoms: A preliminary randomized trial. *Behavior Therapy*, *35*(4), 785–801.

Dalrymple, K. L., & Herbert, J. D. (2007). Acceptance and commitment therapy for generalized social anxiety disorder: A pilot study. *Behavior Modification*, *31*(5), 543–568. Retrieved from PM: 17699117.

Derogatis, L. R., & Cleary, P. A. (1977). Confirmation of the dimensional structure of the SCL-90: A study in construct validation. *Journal of Clinical Psychology*, *33*(4), 981–989.

Eifert, G. H., & Forsyth, J. P. (2005). *Acceptance & Commitment Therapy for Anxiety Disorders. A Practitioner's Treatment Guide to Using Mindfulness, Acceptance and Values-Based Change Strategies*. Oakland: New Harbinger Publications.

Fava, G. A., Grandi, S., Rafanelli, C., Fabbri, S., & Cazzaro, M. (2000). Explanatory therapy in hypochondriasis. *Journal of Clinical Psychiatry*, *61*(4), 317–322. Retrieved from PM: 10830159.

Fink, P., & Schroder, A. (2010). One single diagnosis, bodily distress syndrome, succeeded to capture 10 diagnostic categories of functional somatic syndromes and somatoform disorders. *Journal of Psychosomatic Research*, *68*(5), 415–426.

Fink, P., Ewald, H., Jensen, J., Sorensen, L., Engberg, M., Holm, M., et al. (1999). Screening for somatization and hypochondriasis in primary care and neurological in-patients: a seven-item scale for hypochondriasis and somatization. *Journal of Psychosomatic Research*, *46*(3), 261–273. Retrieved from PM: 10193917.

Fink, P., Ørnbøl, E., & Christensen, K. S. (2010). The outcome of health anxiety in primary care. A two-year follow-up study o n health care costs and self-rated health. *PLoS ONE*, *5*(3), e9873. Retrieved from http://dx.doi.org/10.1371%2Fjournal.pone.0009873.

Fink, P., Ørnbøl, E., Huyse, F. J., de Jonge, P., Lobo, A., Herzog, T., et al. (2004). A brief diagnostic screening instrument for mental disturbances in general medical wards. *Journal of Psychosomatic Research*, *57*(1), 17–24.

Fink, P., Ørnbøl, E., Toft, T., Sparle, K. C., Frostholm, L., & Olesen, F. (2004). A new, empirically established hypochondriasis diagnosis. *American Journal of Psychiatry*, *161*(9), 1680–1691. Retrieved from PM: 15337660.

Fledderus, M., Bohlmeijer, E. T., & Pieterse, M. E. (2010). Does experiential avoidance mediate the effects of maladaptive coping styles on psychopathology and mental health? *Behavior Modification*, *34*(6), 503–519. Retrieved from PM: 20660354.

Forman, E. M., Herbert, J. D., Moitra, E., Yeomans, P. D., & Geller, P. A. (2007). A randomized controlled effectiveness trial of acceptance and commitment therapy and cognitive therapy for anxiety and depression. *Behavior Modification*, *31*(6), 772–799. Retrieved from PM: 17932235.

Frostholm, L., Fink, P., Christensen, K. S., Toft, T., Oernboel, E., Olesen, F., et al. (2005). The patients' illness perceptions and the use of primary health care. *Psychosomatic Medicine*, *67*(6), 997–1005. Retrieved from I:\publikationer MIS\Videnskabelige artikler\FIP\The patients' illness perceptions and the use of primary health care.pdf.

Frostholm, L., Fink, P., Oernboel, E., Christensen, K. S., Toft, T., Olesen, F., et al. (2005). The uncertain consultation and patient satisfaction: the impact of patients' illness perceptions and a randomized controlled trial on the training of physicians' communication skills. *Psychosomatic Medicine*, *67*(6), 897–905. Retrieved from PM: 16314594.

Frostholm, L., Oernboel, E., Christensen, K. S., Toft, T., Olesen, F., Weinman, J., et al. (2007). Do illness perceptions predict health outcomes in primary care patients? A 2-year follow-up study. *Journal of Psychosomatic Research*, *62*(2), 129–138. Retrieved from PM: 17270570.

Frostholm, L., Ornbol, E., Hansen, H. S., Olesen, F., Weinman, J., & Fink, P. (2010). Which is more important for outcome: the physician's or the patient's

understanding of a health problem? A 2-year follow-up study in primary care. *General Hospital Psychiatry*, *32*(1), 1–8. Retrieved from PM: 20114122.

Greeven, A., van Balkom, A. J. L. M., van der Leeden, R., Merkelbach, J. W., van den Heuvel, O. A., & Spinhoven, P. (2009). Cognitive behavioral therapy versus paroxetine in the treatment of hypochondriasis: An 18-month naturalistic follow-up. *Journal of Behavior Therapy and Experimental Psychiatry*, *40*(3), 487–496. http://dx.doi.org/10.1016/j.jbtep.2009.06.005. Retrieved from. http://www.sciencedirect.com/science/article/B6V5V-4WMM7FB-1/2/6f64e5b3624406da88adaf4b558a3b4a

Greeven, A., van Balkom, A. J., Visser, S., Merkelbach, J. W., van Rood, Y. R., Van Dyck, R., et al. (2007). Cognitive behavior therapy and paroxetine in the treatment of hypochondriasis: a randomized controlled trial. *American Journal of Psychiatry*, *164*(1), 91–99. Retrieved from PM: 17202549.

Gureje, O., Ustun, T. B., & Simon, G. E. (1997). The syndrome of hypochondriasis: a cross-national study in primary care. *Psychological Medicine*, *27*(5), 1001–1010.

Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (1999). Acceptance and Commitment Therapy. In *An experiential approoach to behavior change*. New York: The Guilford Press.

Hayes, S. C., Villatte, M., Levin, M., & Hildebrandt, M. (2011). Open, aware, and active: Contextual approaches as an emerging trend in the behavioral and cognitive therapies. *Annual Review of Clinical Psychology*, *7*, 141–168. Retrieved from PM: 21219193.

Hofmann, S. G., Sawyer, A. T., & Fang, A. (2010). The empirical status of the "new wave" of cognitive behavioral therapy. *Psychiatric Clinics of North America*, *33*(3), 701–710. Retrieved from PM: 20599141.

Jacobsen, N. S., & Truax, P. (1991). Clinical Significance: A Statistical Approach to Defining Meaningful Change in Psychotherapy Research. *Journal of Consulting and Clinical Psychology*, *59*(1), 12–19.

Lundgren, T., Dahl, J., & Hayes, S. C. (2008). Evaluation of mediators of change in the treatment of epilepsy with acceptance and commitment therapy. *Journal of Behavioral Medicine*, *31*(3), 225–235. Retrieved from PM: 18320301.

Lundgren, T., Dahl, J., Melin, L., & Kies, B. (2006). Evaluation of acceptance and commitment therapy for drug refractory epilepsy: a randomized controlled trial in South Africa – a pilot study. *Epilepsia*, *47*(12), 2173–2179. Retrieved from PM: 17201719.

Lundgren, T., Dahl, J., Yardi, N., & Melin, L. (2008). Acceptance and Commitment Therapy and yoga for drug-refractory epilepsy: a randomized controlled trial. *Epilepsy & Behavior*, *13*(1), 102–108. Retrieved from PM: 18343200.

Marcus, D. K., & Church, S. E. (2003). Are dysfunctional beliefs about illness unique to hypochondriasis? *Journal of Psychosomatic Research*, *54*(6), 543–547. Retrieved from PM: 12781308.

McManus, F., Surawy, C., Muse, K., Vazquez-Montes, M., & Williams, J. M. (2012). A randomized clinical trial of mindfulness-based cognitive therapy versus unrestricted services for health anxiety (Hypochondriasis). *Journal of Consulting and Clinical Psychology* (Retrieved from PM:22708977).

Ost, L. G. (2008). Efficacy of the third wave of behavioral therapies: A systematic review and meta-analysis. *Behaviour Research and Therapy*, *46*(3), 296–321. Retrieved from PM: 18258216.

Petrie, K. J., & Weinman, J. (2006). Why illness perceptions matter. *Clinical Medicine*, *6*(6), 536–539. Retrieved from PM: 17228551.

Pull, C. B. (2009). Current empirical status of acceptance and commitment therapy. *Current Opinion in Psychiatry*, *22*(1), 55–60. Retrieved from PM: 19122536.

Sorensen, P., Birket-Smith, M., Wattar, U., Buemann, I., & Salkovskis, P. (2010). *A randomized clinical trial of cognitive behavioural therapy versus short-term psychodynamic psychotherapy versus no intervention for patients with hypochondriasis*. X, (1469-8978. (Electronic)).

Taylor, S., & Asmundson, G. J. G. (2004). *Treating health anxiety. A cognitive-behavioral approach*. The Guilford press.

Thomson, A. B., & Page, L. A. (2007). Psychotherapies for hypochondriasis. *Cochrane Database System Reviews*, *4*. CD006520. Retrieved from PM: 17943915.

Twohig, M. P., Hayes, S. C., & Masuda, A. (2006). Increasing willingness to experience obsessions: Acceptance and commitment therapy as a treatment for obsessive-compulsive disorder. *Behavior Therapy*, *37*(1), 3–13. Retrieved from PM: 16942956.

Twohig, M. P., Hayes, S. C., Plumb, J. C., Pruitt, L. D., Collins, A. B., Hazlett-Stevens, H., et al. (2010). A randomized clinical trial of acceptance and commitment therapy versus progressive relaxation training for obsessive-compulsive disorder. *Journal of Consulting and Clinical Psychology*, *78*(5), 705–716. Retrieved from PM: 20873905.

Visser, S., & Bouman, T. K. (2001). The treatment of hypochondriasis: exposure plus response prevention vs cognitive therapy. *Behaviour Research and Therapy*, *39*(4), 423–442. Retrieved from PM: 11280341.

Walser, R. D., & Pistorello, J. (2004). ACT in group format. In: S. C. Hayes, & K. D. Strosahl (Eds.), *A Practical Guide to Acceptance and Commitment Therapy*. NY, USA: Springer Science + Business Media.

Warwick, H. M., Clarke, D. M., Cobb, A. M., & Salkovskis, P. M. (1996). A controlled trial of cognitive-behavioural treatment of hypochondriasis. *British Journal of Psychiatry*, *169*(2), 189–195.

WHO. (1998). *SCAN. Schedules for Clinical Assessment in Neuropsychiatry, version 2.1*. Geneva: World Health Organization, Division of Mental Health.

Zettle, R. D. (2003). Acceptance and commitment therapy (ACT) vs. system desensitization in treatment of mathematics anxiety. *The Psychological Record*, *53*(2), 197–215.

Zettle, R. D. (2007). ACT for depression. In *A Clinician's Guide to Using Acceptance and Commitment Therapy in Treating Depression*. Oakland: New Harbinger Publications.

Zettle, R. D., & Rains, J. C. (1989). Group cognitive and contextual therapies in treatment of depression. *Journal of Clinical Psychology*, *45*(3), 436–445. Retrieved from PM: 2745733.