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Acute treatment of inpatients with psychotic symptoms using Acceptance and Commitment Therapy: Pilot results

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Abstract

Cognitive behavior therapy (CBT) has been demonstrated in a number of randomized controlled trials to be efficacious as an adjunctive treatment for psychotic disorders. Emerging evidence suggests the usefulness of CBT interventions that incorporate acceptance/mindfulness-based approaches for this population. The current study extended previous research by Bach and Hayes (2002. The use of Acceptance and Commitment Therapy to prevent the rehospitalization of psychotic patients: A randomized controlled trial. *Journal of Consulting and Clinical Psychology*, 70, 1129–1139) using Acceptance and Commitment Therapy (ACT) in the treatment of psychosis. Psychiatric inpatients with psychotic symptoms were randomly assigned to enhanced treatment as usual (ETAU) or ETAU plus individual sessions of ACT. At discharge from the hospital, results suggested short-term advantages in the ACT group in affective symptoms, overall improvement, social impairment, and distress associated with hallucinations. In addition, more participants in the ACT condition reached clinically significant symptom improvement at discharge. Although 4-month rehospitalization rates were lower in the ACT group, these differences did not reach statistical significance. Decreases in the believability of hallucinations during treatment were observed only in the ACT condition, and change in believability was strongly associated with change in distress after controlling for change in the frequency of hallucinations. Results are interpreted as largely consistent with the findings of Bach and Hayes and warrant further investigations with larger samples.

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Keywords: Acceptance and Commitment Therapy; Mindfulness; Acceptance; Cognitive behavior therapy; Psychotic disorders; Acute treatment; Hospitalized patients

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Introduction

Schizophrenia and other psychotic disorders are typically chronic and debilitating conditions (Pratt & Mueser, 2002). Many patients experience residual symptoms and comorbid psychiatric problems even when treatment compliance is not an issue (Curson, Patel, Liddle, & Barnes, 1988; Johnstone, Owens, Frith, & Leavy, 1991). Furthermore, the continued experience of positive symptoms is one of the best predictors of rehospitalization (Tarrier, Barrowclough, & Bamrah, 1991). Therefore, the development of efficacious and effective psychosocial treatments is imperative for treating patients with psychotic-spectrum disorders.

Over the past decade, cognitive behavior therapy (CBT) has been found in a number of randomized clinical trials (RCTs) to be efficacious for the treatment of schizophrenia and related psychotic disorders (Gaudiano, 2005; Gould, Mueser, Bolton, Mays, & Goff, 2001; Pilling et al., 2002; Rector & Beck, 2001). The majority of RCTs to date have examined the efficacy of CBT for treating the residual symptoms of psychosis in outpatient samples (e.g., Kuipers et al., 1997). Results show large effect size gains for CBT compared to treatment as usual (TAU), but less robust and specific benefits when CBT is compared to non-specific-supportive interventions (Sensky et al., 2000; Tarrier et al., 1998).

Effective psychosocial treatments may be especially important to implement in the acute phase of psychosis,¹ as subsequent psychotic episodes tend to be associated with increased functional impairment and residual symptoms (Shepherd, Watt, Falloon, & Nigel, 1989). Unfortunately, few studies to date have investigated CBT for treating inpatients with psychosis. In one of the few RCTs with inpatients, Dury, Birchwood, Cochrane, and MacMillan (1996) allocated 40 patients in an acute psychosis to routine care plus group and individual CBT or routine care plus recreational activities. Patients receiving CBT showed superior change on positive symptom measures and faster rates of improvement at post-treatment compared to those receiving recreational therapy.

In a more recent study, Lewis et al. (2002) randomized 315 patients with schizophrenia in acute treatment (inpatient or day treatment program) to routine care alone, routine care plus supportive counseling, or routine care plus CBT for 5 weeks. Results during the acute-treatment phase of the study showed faster improvement in the CBT group compared to routine care (4 vs. 6 weeks, respectively). Eighteen-month follow-up that included booster sessions showed continued advantages on psychotic symptom measures for the CBT group relative to those who received supportive counseling (Tarrier et al., 2004).

In the Dury et al. (1996) study, CBT consisted of 12 weeks of individual and group therapy (approximately 8 h/week). Lewis et al. (2002) provided 15–20 h of treatment over 5 weeks plus outpatient booster sessions. The clinical implications of such results may be limited, as the duration of inpatient psychiatric hospitalization is often no more than 1 week in the US (National Association of Psychiatric Health Systems, 2002). In addition, most studies that have treated inpatients have continued treatment on an outpatient basis following discharge (e.g., Startup, Jackson, & Bendix, 2004). However, up to 75% of psychiatric patients do not follow through consistently with outpatient treatment following discharge from the hospital (Boyer, McAlpine, Pottick, & Olfson, 2000; Nelson, Maruish, & Axler, 2000). This raises the question of whether

¹The term “psychosis” is used throughout the paper to describe individuals with psychotic-spectrum disorders in general, including but not limited to patients with schizophrenia.

short-term interventions delivered exclusively during hospitalization could meaningfully improve short- and long-term outcome. Currently, there is a dearth of research investigating feasible and effective psychotherapeutic approaches exclusively for inpatients.

Experts in CBT for psychosis stress the importance of developing a strong therapeutic alliance with the patient prior to initiating cognitive restructuring techniques that target psychotic symptoms (Kingdon & Turkinton, 1994). In support of this warning, a study by Milton, Patwa, and Hafner (1978) found that assuming a confrontational style with inpatients when treating their psychotic symptoms was associated with poorer outcome. Several recent studies have reported preliminary positive results adapting CBT for enhancing self-esteem in patients with longer hospital stays (Hall & Tarrier, 2003), for treatment started during inpatient and continued through outpatient (Tarrier et al., 2004; Startup et al., 2004), and for briefer outpatient treatment (Turkington, Kingdon, & Turner, 2002), but few have adapted CBT for the acute inpatient treatment of psychosis. Although it is possible that traditional CBT can be adapted to be used successfully in the short-term treatment of psychotic episodes, some are beginning to explore newer approaches that may be particularly applicable to this population (Bach, Gaudiano, Pankey, Herbert, & Hayes, *in press*).

Newer cognitive-behavioral therapies are beginning to emerge that incorporate acceptance and mindfulness elements into a cognitive-behavioral framework (e.g., Linehan, 1993; Segal, Williams, & Teasdale, 2001). Some refer to these as reflecting the “third wave” of behavior therapies—the first being traditional behavior therapy and the second being cognitive therapy (Hayes, 2004). One such approach is Acceptance and Commitment Therapy (ACT; Hayes et al., 1999), which incorporates acceptance, mindfulness, and values clarification work to enhance traditional behavioral interventions. In contrast to formal disputation of dysfunctional thought content as in traditional CBT, ACT focuses on modifying the individual’s relationship to his or her thinking more broadly. Although beyond the scope of this paper, the treatment is based on Relational Frame Theory (RFT; Hayes, Barnes-Holmes, & Roche, 2001), a behaviorally oriented theory and research program concerning the nature of language and cognition. The primary assertion of RFT is that verbally mediated private events (e.g., cognitions, emotions, memories) do not influence behavior directly through their content or frequency, but instead through the context in which they occur. ACT also is based on principles derived from the experimental literature describing the paradoxical effects of thought suppression and psychopathology (Purdon, 1999).

In contrast to avoidance and struggle with negative thoughts and emotions, or to logical disputation of putatively biased cognitions, ACT encourages individuals to accept and experience internal events non-judgmentally (i.e., mindfully), while simultaneously working toward the pursuit of personally defined behavioral goals (Hayes et al., 1999). Although definitions of mindfulness vary widely, put simply the term means “paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally” (Kabat-Zinn, 1994, p. 3). This stance is fostered primarily through the use of experiential exercises (e.g., meditation) and didactic metaphors, and is presented in the context of values clarification, goal setting, and overt behavior change strategies (e.g., behavioral activation). In other words, patients are encouraged to minimize strategies aimed at over-controlling unpleasant private experiences, and instead to notice non-judgmentally the occurrence of negative thoughts, feelings, and sensations that may impede goal attainment without acting on them. Acceptance does not imply “giving in” to symptoms, but instead recognizes that thoughts are products of mental events rather than the self.

Preliminary RCTs suggest the usefulness of ACT for treating a wide variety of problems, including depression, anxiety disorders, substance use disorders, chronic medical illness, and work-related stress, among others (see Hayes, Masuda, Bissett, Luoma, & Guerrero, 2004 for a review). Although outcomes have been similar in early studies comparing ACT and CBT, ACT-consistent mechanisms of change sometimes differentiate treatments (e.g., Bond & Bunce, 2000; Zettle & Raines, 1989). Only one RCT to date has investigated the efficacy of ACT in the treatment of psychosis. Bach and Hayes (2002) randomly assigned 80 patients to TAU or TAU plus four individual sessions of ACT during hospitalization, with the termination session occurring shortly after discharge. Patients were taught to accept unavoidable events, to notice psychotic symptoms without treating them as either true or false, and to identify and work toward valued goals despite their symptoms. Patients supplied simple Likert-scale ratings of the frequency, distress, and believability associated with their hallucinations and delusions at pre-treatment and 4-month follow-up. Those receiving ACT demonstrated significantly higher reporting of but lower believability in symptoms compared to the TAU only group. Furthermore, the rehospitalization rate in the ACT group was only half that of the TAU only group at follow-up.

ACT was chosen as the experimental treatment in the current study based on several factors. First, our goal was to replicate independently and to expand upon the findings of Bach and Hayes (2002). Also, ACT appeared particularly suited for the target population, as the treatment emphasizes coping strategies for traditionally difficult-to-treat illnesses. Furthermore, our goal was to develop an intervention for an acute-treatment setting, where it would be difficult to ensure a strong therapeutic alliance prior to implementing techniques that target psychotic symptoms. Whereas traditional CBT focuses on directly modifying dysfunctional thought content through rational deliberation, ACT focuses on modifying the person's relationship to his or her thinking through the cultivation of mindfulness and acceptance (i.e., separating self from thinking). Therefore, it was hypothesized that patients with psychosis would be easier to engage in treatment and more willing to consider alternative strategies for coping with psychotic symptoms using ACT than more traditional therapies, at least in the short term. Furthermore, due to the brief and often unpredictable lengths of stay on psychiatric inpatient units, we sought to develop an intervention that could be flexibly delivered in such an environment and that could be presented in as few as one session if necessary. ACT appeared particularly useful for this purpose. Finally, ACT resides within the family of behavioral and cognitive-behavioral therapies, which have demonstrated efficacy for treating this population.

In the current study, inpatients with psychotic symptoms were randomly assigned to enhanced treatment as usual (ETAU) or ETAU plus individual sessions of ACT during hospitalization for an acute psychiatric condition. The number of ACT sessions delivered varied as a function of a patient's length of stay on the unit. In addition to the self-ratings of psychotic symptoms used in the Bach and Hayes (2002) study, standardized symptom measures were administered at pre-treatment and then prior to discharge. At 4-month follow-up, rehospitalization data were obtained. The general aim of the study was to develop and pilot test a flexible and feasible intervention for psychosis in an acute-treatment setting. It was hypothesized that the ACT group would show greater improvement on symptom measures at post-treatment and decreased rehospitalization rates at follow-up. Also, exploratory analyses were conducted to examine theoretically derived correlates of symptom change.

Method

Participants

The design of the study was a prospective, non-blinded, randomized pilot trial with the aim of developing and providing preliminary evidence for a brief intervention for inpatients with psychotic symptoms. Participants were recruited from a university-based hospital psychiatric medical care unit in a major metropolitan city in the US. Participants met *DSM-IV* American Psychiatric Association (APA, 1994) criteria for a psychotic disorder or affective disorder with psychotic symptoms that required hospitalization based on an intake assessment conducted by the treating psychiatrist. The inclusion criteria were: (1) hospitalized with current or recent (within past week) psychotic symptoms (hallucinations and/or delusions); (2) diagnosis of a psychotic disorder (i.e., Schizophrenia, Schizoaffective Disorder, Schizophreniform Disorder, Delusional Disorder, Brief Psychotic Disorder, Psychotic Disorder NOS) or other psychiatric disorder with psychotic features that required hospitalization (e.g., Major Depression with psychotic features, Bipolar Disorder with current manic episode); (3) ability to provide informed consent; and (4) fluency in English. The exclusion criteria were: (1) diagnosis of Mental Retardation; (2) inability to participate in psychotherapy/research due to acute medical condition or florid psychosis; (3) psychotic symptoms due to a general medical condition; or (4) patient stay on the unit known in advance to be less than 1 week.

A total of 40 adults hospitalized with a psychiatric illness participated in the study. Average length of stay on the unit was 10.7 days ($SD = 11.5$). Those in the ACT condition received an average of three treatment sessions (Med = 3; Range = 1–5). Average age of participants was 40 ($SD = 10$). The sample was predominantly male (64%) and African-American (88%). Educational attainment was relatively low in the sample, with 35% not graduating high school, 36% obtaining a high school diploma or equivalency, and 17% possessing some post-secondary education. The majority of participants were unemployed or receiving disability compensation (86%), with only 13% working full- or part-time. Regarding housing status, 29% were homeless or living in a shelter, 38% were living with family or friends, 17% were living in supervised housing (e.g., nursing home), and 12% rented/owned property. Only 12% of participants were currently married, with the remaining single, divorced, or widowed. The majority of participants carried a primary diagnosis of a psychotic disorder (58%), with the remaining diagnosed with a major mood disorder with psychotic symptoms.² Over half of the participants possessed a comorbid substance use disorder (58%) and the majority possessed at least one major medical condition (82%).

Measures

Brief Psychiatric Rating Scale

The Brief Psychiatric Rating Scale (BPRS), one of the most widely used psychiatric rating scales, is an 18-item semi-structured clinical interview used to assess common psychiatric

²Psychosis NOS ($n = 11$), Major Depression with psychotic features ($n = 9$), Schizophrenia ($n = 7$), Depressive Disorder NOS with psychotic features ($n = 6$), Schizoaffective Disorder ($n = 5$), and Bipolar Disorder with psychotic features ($n = 2$).

symptoms (Lukoff, Nuechterlein, & Ventura, 1986; Overall & Gorham, 1962). In addition to the total score, factor analyses of the BPRS have validated thought disorder (positive symptoms), anergia (negative symptoms), and affect (depression, anxiety, hostility) subscales (Long & Brekke, 1999; Mueser, Curran, & McHugo, 1997). The BPRS is a valid measure that is sensitive to change in acute inpatient care settings (Varner, Chen, Swann, & Moeller, 2000). Anchor points and descriptors were used in the current study as Gabbard, Coyne, Kennedy, and Beasley (1987) found that they increased interrater reliability. Raters were trained to proficiency based on the manual by Ventura et al. (1993).

Clinical Global Impressions Scale

The Clinical Global Impression (CGI) (National Institutes of Mental Health, 1985) is a global rating of severity and improvement based on a seven-point Likert scale: 1 = normal, not at all ill, to 7 = among the most extremely ill patients. The CGI has high interrater reliability and has been used extensively in psychiatric outcome research. Anchor points and descriptors were used in the current study to increase reliability of administration. For example, “moderately ill” (4) was defined as “meets full criteria for psychiatric diagnosis”.

Self-ratings of psychotic symptoms

Psychotic symptoms also were assessed in a manner similar to the methods used by Bach and Hayes (2002). Participants were asked to rate separately the frequency, believability, and distress associated with their hallucinations and/or delusions on a Likert-scale format. For example, regarding frequency of hallucinations, participants were asked, “On average, how often have you heard voices in the month prior to admission?” 1 = never; 2 = less than once a week; 3 = about once a week; 4 = several times a week; 5 = daily; 6 = more than once a day; 7 = almost constant. Participants also rated the believability of their psychotic symptoms: “On a scale from 0 to 10, how much do you believe that when you experience (specific hallucination) [or think about (specific delusion)] that it is real [or that it is true that (specific delusion)]? Zero means that you are certain it is not real or true, and 10 means you are absolutely certain that it is real or true.” Finally, participants rated the distress associated with their psychotic symptoms: “On a scale from 0 to 10, how bothered are you when you experience (specific hallucination) [or think about (specific delusion)]? Zero means not distressed at all and 10 means the most distressed you’ve ever been.” Questions were read to participants and they also were provided a sheet with the Likert-scale ratings and descriptors for each question. Participants were given the opportunity to circle their response; or if they preferred, provided their answer orally to the interviewer. At post-treatment, questions were reworded to assess the period since treatment began.

Sheehan Disability Scale

The Sheehan Disability Scale (SDS) is a self-report measure of impairment due to a psychiatric illness (Leon, Olfson, Portera, Farber, & Sheehan, 1997). Impairment from symptoms is rated separately in family, work, and social domains based on a 10-point Likert-scale format. The SDS has good criterion-related validity for impairment associated with psychiatric disorders (Leon, Shear, Portera, & Klerman, 1992). Participants were read the questions by the interviewer and they circled their responses or provided responses orally to the interviewer if preferred.

Rehospitalization data

Data on rehospitalization dates to psychiatric units were collected by contacting the patient's insurance provider at 4-month follow-up after obtaining written consent from participants. Data also were obtained from chart records for those who were rehospitalized on the same unit during the follow-up period.

Treatments

Enhanced treatment as usual

Potential participants in this study were considered psychiatric “high risk” patients because of their anticipated severity and comorbidity. Therefore, an enhanced routine care condition was designed to balance ethical considerations (as recommended by Reynolds et al., 2001). In the current study, TAU consisted of psychopharmacology, case management, and psychotherapy on the unit. All patients participating in the study were taking anti-psychotic and/or other psychotropic medication during their inpatient stay. Once patients were stabilized on their medications, they participated in standard milieu therapy on the unit (group and activities therapies twice daily and individual therapy as needed). Therapy on the unit was conducted by psychologists, social workers, mental health workers, and psychology interns. Therapy groups typically focused on psychoeducation about illness, symptom identification, mood management techniques, stress reduction, relapse prevention, and goal setting. Patients also received unstructured individual therapy and case management as appropriate. Patients were referred to appropriate community services upon discharge.

In addition to routine care, patients received enhanced services as part of their participation in the study. Participation in the study required a comprehensive assessment of psychiatric symptoms. These results were discussed with the interdisciplinary treatment team and used for treatment planning purposes. Furthermore, the ACT therapist met with participants in the ETAU condition daily to provide additional support and to answer questions. This contact helped to control for the possible confound of extra individual attention in the ETAU+ACT condition. The goal was to establish a rapport with the ETAU participants and to identify useful clinical information that could be relevant for treatment planning purposes, which then could be relayed to the treatment team. Care was made not to discuss or suggest coping strategies related to ACT or other cognitive-behavioral techniques. Although not specifically structured, the amount of individual contact time provided to participants in the ETAU condition was approximately 15 min daily. It is important to note that ETAU participants were receiving equal amounts of formal therapy contact time compared to ACT participants, as therapy on the unit was conducted concurrently with ACT individual sessions in 1-h periods. Therefore, the primary difference was the format of treatment, as individual therapy was less frequent in the ETAU only group.

Acceptance and Commitment Therapy

The ACT protocol used in the current study was delivered in an individual format and was based on a modified treatment manual developed by Hayes et al. (1999) and Bach and Hayes (2002). Patients received an average of three individual ACT sessions. The ACT protocol was designed so that the sessions could be delivered in a “stand alone” format, which did not require the completion of a pre-determined number of sessions. Each 1-h session contained a core set of

components that allowed participants to participate in the number of individual sessions appropriate to their length of stay.

Each session began with a brief educational component that addressed psychotic symptoms. Next, the ACT model was presented to provide a rationale for treatment. Various mindfulness and acceptance exercises were practiced to decrease avoidance or struggle with internal experiences. Values and behaviorally consistent goals were elicited and the role of disturbing thoughts/emotions as barriers to goal attainment was discussed. Each session ended with a review and suggestions for practice exercises to attempt between sessions. A core set of mindfulness/acceptance exercises was rotated across sessions, for a total of four session formats with different content. The four ACT session “themes” were: (1) willingness as an alternative to control/struggle; (2) workability as a guide to coping strategies; (3) acceptance of uncontrollable vs. controllable events; and (4) thoughts as products of mental events and not the self. In general, patients were encouraged to increase their willingness to accept the *experience* of psychotic symptoms non-judgmentally, while practicing valued behavioral goals. In this way, patients decreased unworkable strategies for dealing with psychotic symptoms that impeded goal attainment. See [Table 1](#) for a sample session outline.

Procedure

Patients underwent routine assessment procedures upon hospital admission, which included a psychiatric evaluation to determine *DSM* diagnosis. Potential candidates who met criteria for the study were referred by the supervising psychologist on the unit through the routine review of new patient charts. Patients were approached by the first author to determine their interest in the study based on their date of admission and availability. This was done after consultation with the patient’s treatment team regarding the appropriateness of participation in research. Ability to participate in research was further assessed as appropriate by verifying that the patient could respond to questions about the study after it was presented by the investigator. If a patient was interested in participating, informed consent was obtained and demographic information collected. Procedures were approved by the site’s Institutional Review Board.

Immediately after obtaining consent, participants completed assessment measures and were allocated to ETAU or ETAU+ACT. Simple randomization without blocking or stratification based on a computer generated list was used without concealment. One therapist conducted all ACT sessions. Assessment interviews were conducted by the ACT therapist or one of the two research assistants for both groups. Raters and staff were not blind to treatment allocation. Patients in the ETAU condition received standard treatment on the unit plus additional regular contact with the ACT therapist who consulted with their treatment team (approximately 15 min/day). Patients in the ETAU+ACT condition received individual ACT sessions during the same time that the ETAU participants were receiving standard group/individual sessions on the unit. All treatment sessions were approximately 1 h in length. No adverse events were observed from participation in the study.

Prior to discharge, participants completed the same assessment measures. All patients were discharged to appropriate community services, which included case management and community outpatient care. At 4-month follow-up, rehospitalization data were obtained from patients’ insurance providers by phone or from hospital records if patients were readmitted during that time

Table 1
Sample “stand alone” ACT for psychosis session outline

Components	Description
Psychoeducation ^a	<ul style="list-style-type: none"> ● Explain psychotic symptoms in simple language. ● Normalize “psychotic” experiences.
ACT model	<ul style="list-style-type: none"> ● Explore unsuccessful past coping attempts, particularly as they relate to avoidance or struggle with psychotic symptoms and resulting negative behavioral consequences. ● Describe Polygraph Metaphor (pp. 123–124), which emphasizes the unworkability of control-oriented strategies. ● Introduce willingness as an alternative stance toward symptoms.
Mindfulness/acceptance exercise ^b	<ul style="list-style-type: none"> ● Describe and practice the Soldiers in the Parade meditation (pp. 159–160). ● Focus on the process of doing the exercise in contrast to any expected outcome to be achieved.
Vales/goals clarification	<ul style="list-style-type: none"> ● Describe the Skiing Metaphor (pp. 220–221), which emphasizes making engagement in the process the desired outcome. ● Elicit personal values in multiple areas. ● Elicit goals in the form of specific behavioral steps that can be taken in the present moment to work toward values.
Session review	<ul style="list-style-type: none"> ● Review the “take home” messages from session.
Homework practice	<ul style="list-style-type: none"> ● Emphasize homework as a form of committed action one chooses in order to work toward personal values. ● Ask the patient to practice the Soldiers in the Parade meditation 15 min daily.

^aAdapted from Kingdon and Turkington (1994). Page numbers refer to the text by Hayes, Strosahl, and Wilson (1999).

^bFormal meditation practices may be contraindicated for some psychotic patients (Sethi & Bhargava, 2003). Other nonmeditation-based mindfulness exercises from ACT can be substituted in such cases.

period. Due to characteristics of participants, many of whom were homeless and lacking reliable contact information after discharge, we were unable to collect symptom ratings at follow-up.

Reliability/fidelity checks

Although initially proposed that ACT sessions would be audiotaped to ensure treatment fidelity, most patients would not agree to this practice. Regular consultation and review of sessions was provided on site by a staff psychologist and off site by an expert in ACT (J.D.H). Furthermore, assessments (5%) at various time points over the course of the study were conducted by one assessor while another assessor observed and recorded independent ratings, which then were compared for reliability. Interrater agreement for clinician ratings (i.e., BPRS,

CGI) was high (intraclass correlation $\alpha = 0.90$), suggesting reliable administration of measures. Detailed anchor points also were used to ensure reliable administration of clinician ratings, according to the Ventura et al. (1993) training manual.

Statistical analyses

α -levels of 0.05 and two-tailed tests were used in the following analyses. Considering the modest sample size, the preliminary nature of this study, and the importance of balancing Type I and Type II error, unadjusted p -values are reported. Also, marginally significant results ($p < 0.10$) are noted accordingly. Independent-samples t -tests and χ^2 -tests were conducted to examine potential pre-treatment differences between groups. Primary analyses were conducted on symptom severity measures at post-treatment and rehospitalization data at follow-up. Secondary analyses included assessments of impairment from illness and the clinical significance of gains, as well as exploratory regression analyses.

Continuous measures were analyzed by means of analysis of covariance (ANCOVA), with pre-treatment scores used as covariates (see Behar & Borkovec, 2003). Rehospitalization data were analyzed by computation of an odds ratio (Bland & Altman, 2000), χ^2 -test, and Kaplan–Meier survival analysis. Clinically significant improvement was designated if a patient met criteria for reliable change (i.e., computation of the Reliable Change Index) and showed a 2 SD improvement pre- to post-treatment on the BPRS (based on methods described by Jacobson & Truax, 1991), with group differences examined by means of a χ^2 -test and number needed to treat (NNT; Cook & Sackett, 1995). Effect sizes between groups were computed on the BPRS using Cohen's d -statistic.³ Finally, regression analyses were conducted to examine covariates of change in distress associated with psychotic symptoms, similar to procedures used by Gaudiano and Herbert (2003). Residuals in contrast to absolute gain scores were used in analyses, as recommended by Steketee and Chambless (1992).

Intent-to-treat (ITT) analyses also were conducted to examine the reliability of completer analyses. Using SPSS Missing Value Analysis software and following procedures outlined by Hill (1997), the expectation-maximization (EM) algorithm was used to impute missing values. EM is an accepted method for imputing missing values in longitudinal data and has been shown to be superior to simple regression imputation techniques (Graham & Donaldson, 1993). In short, the EM algorithm computes missing values based on maximum likelihood estimates using known participant variables in an iterative process (see Dempster, Laird, & Rubin, 1977). It is recommended that multiple methods be used for examining datasets with missing values to examine the consistency of results (Mazumdar, Liu, Houck, & Reynolds, 1999).

Results

Participant flow

Fig. 1 depicts a diagram showing participant flow throughout study phases. Of the 38 participants who completed treatment, post-treatment data were missing for nine participants due

³Cohen's (1988) d -statistic: $d = M_1 - M_2 / SD_{\text{pooled}}$, where $SD_{\text{pooled}} = \sqrt{SD_1^2 + SD_2^2} / 2$.

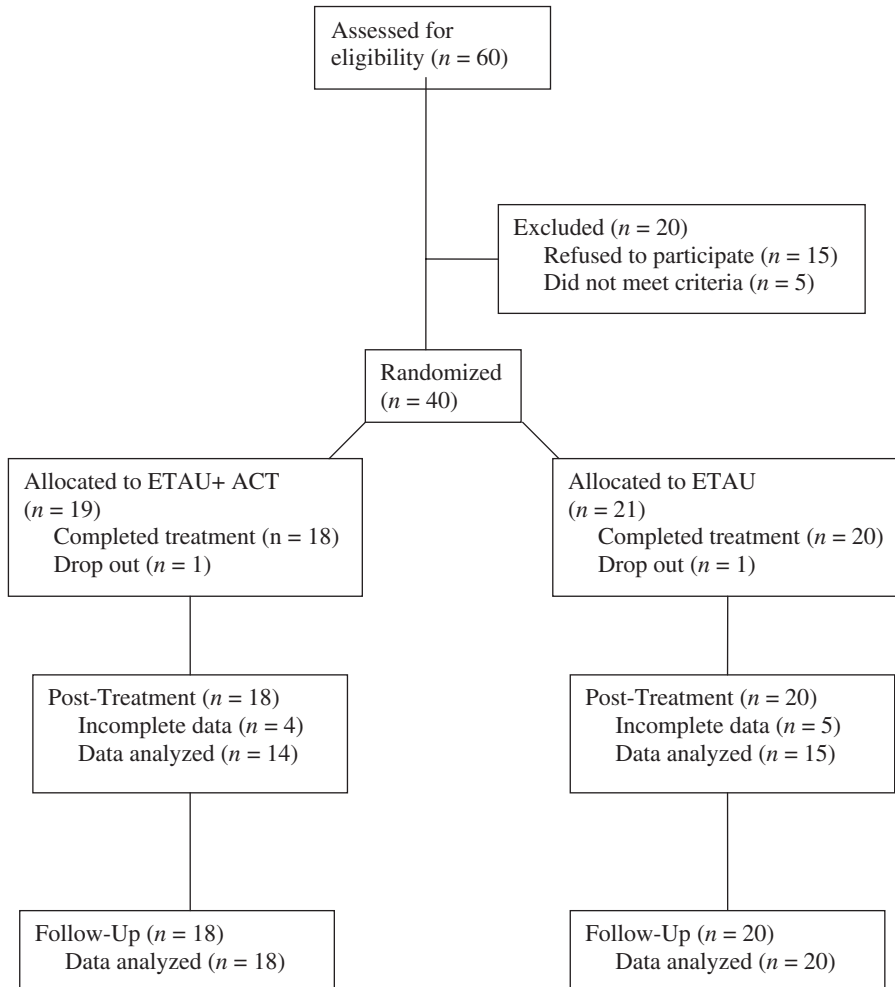


Fig. 1. Participant flow diagram for study phases.

to their unexpected discharge from the unit before completing the assessments. One participant later withdrew from the ACT condition and one from the ETAU condition. Therefore, post-treatment completer analyses were conducted on the remaining 15 participants in the ETAU condition and 14 participants in the ACT condition. See Table 2 for a depiction of raw score means and SDs (before adjustment at covariates) for the outcome measures.

Preliminary analyses

Demographics

Preliminary analyses were conducted to examine the comparability of groups on pre-treatment measures. No significant differences were found between groups for age, length of stay, race, educational level, relationship status, employment status, housing status, insurance coverage, primary diagnosis, presence of a substance use disorder, or presence of a major medical condition.

Table 2
Raw score means (SDs) of pre- and post-treatment measures for completer and intent-to-treat samples

Measures	Completers <i>n</i> = 29		Intent-to-treat <i>n</i> = 40	
	ETAU <i>n</i> = 15	ETAU + ACT <i>n</i> = 14	ETAU <i>n</i> = 19	ETAU + ACT <i>n</i> = 21
BPRS-total				
Pre	59.8 (7.2)	60.3 (9.1)	59.0 (8.0)	58.4 (8.6)
Post	46.7 (9.5)	41.9 (9.1)	45.6 (8.5)	41.6 (7.8)
BPRS-TD				
Pre	13.5 (5.0)	11.2 (4.2)	14.5 (5.2)	11.1 (3.7)
Post	10.9 (4.3)	7.7 (3.3)	11.2 (4.0)	7.8 (2.9)
BPRS-nergia				
Pre	12.1 (4.7)	13.8 (4.3)	11.2 (5.0)	12.8 (8.5)
Post	8.5 (4.2)	8.6 (3.4)	8.2 (3.7)	8.5 (3.1)
BPRS-affect				
Pre	23.9 (3.0)	25.7 (3.1)	21.9 (4.3)	25.0 (3.5)
Post	18.2 (5.3)	16.4 (4.5)	16.2 (5.6)	16.2 (4.0)
CGI-S				
Pre	6.1 (0.3)	6.0 (0.4)	6.1 (0.2)	6.0 (0.4)
Post	4.7 (1.1)	4.1 (0.9)	4.6 (0.9)	4.2 (0.8)
CGI-I				
Post	3.0 (1.2)	2.3 (0.6)	—	—
H-frequency				
Pre	4.6 (2.4)	5.5 (1.7)	4.6 (2.4)	5.4 (2.0)
Post	3.7 (2.3)	3.9 (2.3)	3.6 (2.0)	3.9 (2.0)
H-distress				
Pre	6.2 (3.7)	8.3 (2.3)	5.9 (3.6)	8.1 (2.8)
Post	6.9 (3.2)	6.5 (3.3)	6.5 (2.9)	6.7 (3.1)
H-believability				
Pre	7.2 (3.4)	7.6 (3.0)	7.1 (3.2)	7.5 (3.3)
Post	6.9 (3.6)	5.7 (3.8)	6.5 (3.2)	5.9 (3.6)
SDS-work				
Pre	8.7 (2.0)	8.6 (1.6)	8.3 (2.1)	8.8 (1.5)
Post	7.2 (3.2)	6.3 (2.6)	6.5 (3.3)	6.4 (2.6)
SDS-social				
Pre	7.7 (2.5)	8.9 (1.5)	7.1 (3.2)	8.6 (2.5)
Post	7.6 (2.7)	6.5 (2.9)	6.8 (3.0)	6.6 (2.8)
SDS-family				
Pre	8.8 (1.3)	8.9 (2.3)	8.4 (2.0)	8.9 (2.3)
Post	7.2 (2.7)	6.9 (2.6)	6.6 (2.9)	7.0 (2.5)

ETAU: enhanced treatment as usual; ACT: Acceptance and Commitment Therapy; BPRS: Brief Psychiatric Rating Scale; BPRS-TD: thought disorder subscale; H-frequency: self-reported frequency of hallucinations; H-distress: self-reported distress from hallucinations; H-believability: self-reported believability in hallucinations; CGI: Clinical Global Impressions Scales; CGI-S: severity rating; CGI-I: improvement rating; SDS: Sheehan Disability Scale, SDS-work: work subscale; SDS-social: social subscale; SDS-family: family subscale.

However, a significant difference was found between groups for gender ($\chi_1 = 10.17, p < 0.01$), with more female participants in the ACT condition (63%) compared to the ETAU condition (14%). No significant differences were found on demographic characteristics for those who agreed to participate in the study and those who refused.

Pre-treatment measures

We compared levels of positive psychotic symptoms based on the BPRS thought disorder subscale in our acute psychiatric sample to data taken from a BPRS factor analysis study with non-acute schizophrenic patients (Long & Brekke, 1999; $M = 5.9, SD = 3.1$). As expected, mean thought disturbance scores were significantly higher in the current acute patient sample ($t_{41} = 8.89, p < 0.001$). Examination of pre-treatment scores by group showed a significant difference on the BPRS thought disorder subscale ($t_{40} = 3.86, p < 0.01$). Marginally significant differences were found on the BPRS affect subscale ($t_{40} = 2.43, p = 0.07$). No other group differences were found. In summary, the ACT group showed greater severity on the BPRS affect subscale, whereas the ETAU group showed greater severity on the thought disorder and disorganization subscales.

Gender differences

Due to gender differences between groups, follow-up tests were conducted on demographic characteristics and pre-treatment scores by gender. Significant differences were found between gender and relationship status ($\chi_1 = 15.62, p < 0.01$) and comorbid substance use disorder ($\chi_1 = 5.74, p < 0.05$). Specifically, males were more likely than females to be single (83% vs. 27%, respectively) and to have a comorbid substance use disorder (72% vs. 33%, respectively). In addition, a significant difference was found between males and females on the BPRS affect subscale ($t_{38} = 2.54, p < 0.05$) and thought disorder subscale ($t_{38} = 2.41, p < 0.05$). Specifically, males showed greater severity on the BPRS thought disorder subscale (male $M = 14.6$; female $M = 11.1$), whereas females showed greater severity on the BPRS affect subscale (male $M = 21.8$; female $M = 25.0$). No other significant differences were found. In summary, males showed greater severity of psychotic symptoms and more comorbid substance use than females, who possessed more severe mood and anxiety problems.⁴

Primary analyses

Psychotic symptoms and overall severity

Primary targets of the intervention included psychotic symptoms and overall severity. Based on an ANCOVA covarying pre-treatment scores, a significant difference between groups was found

⁴Gender was not used in the primary analyses as a covariate. Miller and Chapman (2001) note that although it is possible to use certain variables (e.g., gender) as covariates from a statistical perspective, results may be impossible to interpret in any meaningful way. Further, covarying gender would also have covaried treatment response between groups, as the two were confounded. Due to possible baseline differences in symptom profiles by gender, pre-treatment scores were used as covariates in all analyses instead. Small gender \times treatment cell sizes prevented statistical examination of post-treatment measures by gender. However, visual examination of post-treatment means did not suggest any systematic differences within groups by gender. In other words, both males and females improved similarly in the ACT group compared to the ETAU group.

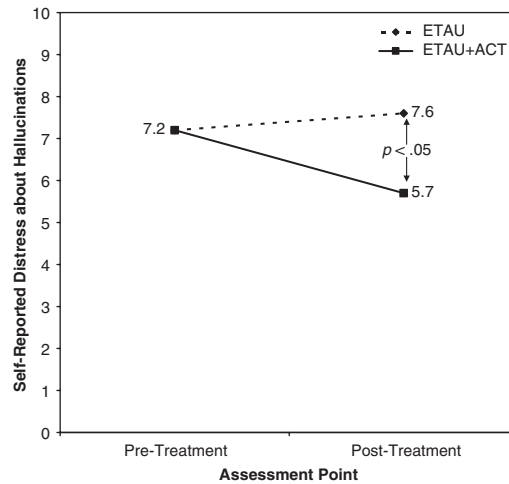


Fig. 2. Group differences on self-reported distress from hallucinations. *Note:* Pre-treatment scores used as covariate.

in distress related to hallucinations⁵ ($F_{1,26} = 4.62$, $p < 0.05$). The ACT group ($M = 5.7$)⁶ showed greater improvement compared to the ETAU group ($M = 7.6$) at post-treatment; see Fig. 2. No significant group effects were found on hallucination frequency or believability self-ratings. Furthermore, no significant group differences were found on the CGI-S, BPRS total, or BPRS thought disorder subscale (positive symptoms). ITT analyses with EM imputed missing data showed the same pattern of results, with the ACT group showing significantly greater improvement on hallucination distress self-ratings ($F_{1,37} = 4.58$, $p < 0.05$). Finally, an independent-samples t -test was conducted to examine the CGI improvement scale, which was rated at post-treatment. A marginally significant difference was found ($t_{27} = 2.00$, $p = 0.05$), with the ACT group ($M = 2.3$) showing greater improvement compared to the ETAU group ($M = 3.0$).

Rehospitalization

At 4-month follow-up, 45% of participants in the ETAU only condition (9/20) were rehospitalized compared to only 28% of those in the ACT condition (5/18). The odds ratio was 1.62 ($CI_{95} = 0.46$ – 5.74), meaning that the ETAU group had a 1.62 times greater likelihood of rehospitalization. However, no significant group difference was identified based on χ^2 -test or Kaplan–Meier survival analysis.

⁵Too few participants provided self-ratings of delusions for analyses to be conducted (total $n = 8$), although all endorsed hallucinations. It is important to note that these ratings were based on *self-report*, as some patients were paranoid and denied these symptoms even if other sources of information supported their presence. Approximately half ($n = 20$) of the sample showed moderate to severe delusions according to the BPRS assessment.

⁶Note that the means presented in text are based on covariate analyses.

Secondary analyses

Mood symptoms and impairment

Secondary targets of intervention included mood symptoms and impairment from illness. For completers, a significant difference was found between groups on the SDS social subscale ($F_{1,26} = 9.09, p < 0.01$), with the ACT group ($M = 5.9$) showing greater improvement compared to the ETAU group ($M = 8.2$). No significant group differences were found on the SDS work or family subscales. Furthermore, a marginally significant difference was found on the BPRS affect subscale ($F_{1,37} = 3.47, p = 0.07$), with those in the ACT condition ($M = 15.6$) showing greater improvement compared to the ETAU condition ($M = 18.9$). No group differences were observed on the BPRS anergia (negative symptoms). ITT analyses showed a similar pattern of results, with the ACT group demonstrating significantly greater improvement on the SDS social subscale ($F_{1,37} = 6.45, p < 0.05$) and marginally significant improvement on the BPRS affect subscale ($F_{1,37} = 3.73, p = 0.06$).

Clinically significant change

Effect sizes were calculated for changes on the BPRS total score. The ACT group showed medium effect size gains compared to the ETAU only group at post-treatment ($d = 0.60$). Responders were defined as patients demonstrating reliable symptom change and showing at least 2 SD improvement on the BPRS total scale (see Jacobson & Truax, 1991). Based on χ^2 results, a significant difference was found in improvement on BPRS total scores between groups ($\chi^2 = 6.81, p < 0.01$). More participants reached a clinically significant improvement in the ACT group (50%) compared to the ETAU group (7%).

An alternative method of interpreting the data involves the calculation of relative risk (Egger, Smith, & Phillips, 1997). The absolute risk reduction by post-treatment was 43.3% ($CI_{95} = 14.3\text{--}72.4\%$). In other words, ACT increased the probably of achieving clinically significant change by 43% relative to the ETAU condition. Furthermore, the NNT to observe the benefit of ACT over ETAU was 3 ($CI_{95} = 1.4\text{--}7.0$). One in every three patients would benefit more from ACT than ETAU.

Exploratory regression analyses

The relationship between treatment type and hallucination frequency, believability, and distress was explored. First, Pearson r correlations were conducted between hallucination self-ratings at pre- and post-treatment. All variables were moderately to highly correlated with each other at both time points (all p 's < 0.05). Next, repeated-measures ANOVAs were conducted to examine pre- to post-treatment changes in believability of hallucinations separately for each group. A significant time main effect showing decreases in believability of hallucinations was found for the ACT group ($F_{1,13} = 5.56, p < 0.05$), but not the ETAU group. Finally, a multiple regression analysis was conducted to test whether change in believability of hallucinations was associated with change in distress beyond the variance accounted for by change in frequency for the ACT group. Due to reliability problems with absolute change scores, we instead computed residual gain (RG) scores (Steketee & Chambless, 1992). RG frequency was entered into the regression equation first followed by RG believability to predict RG distress. In the final model, change in hallucination believability ($p = 0.001$) was an independent predictor of change in distress

Table 3

Hierarchical multiple regression analysis predicting change in hallucination distress based on change in hallucination frequency and believability for patients in the ACT condition

Variables predicting distress	Coefficients		<i>t</i>	<i>p</i>
	Unstandardized	Standardized		
Equation #1				
1. Frequency	0.36	0.36	1.32	0.211
Equation #2				
1. Frequency	0.38	0.37	2.15	0.054
2. Believability	0.68	0.72	4.25	0.001

Note: Final model: $F_{2,11} = 11.15$, $p < 0.01$, $R^2 = 0.67$. Distress = self-reported distress associated with hallucinations; frequency = self-reported frequency of hallucinations; believability = self-reported believability of hallucinations. Residual gain scores were used in regression analyses.

after controlling for change in frequency, which was only marginally significant ($p = 0.054$) (see Table 3). The same regression analysis was not significant when run on the ETAU only group as expected, because no significant decrease in believability of hallucinations over time was found.

Discussion

Interpretation of results

The hypothesis that ACT would produce superior outcomes was supported only in certain domains. The ACT group showed superiority to ETAU on measures related to affective severity, global improvement, distress associated with hallucinations, and social functioning. Furthermore, the ACT group demonstrated greater overall clinically significant symptom improvement. No significant differences between groups were observed on several other measures, most notably those related to the frequency or severity of psychotic symptoms.

Furthermore, the magnitude of between-group differences in overall symptom severity was in the medium effect size range. Although mean improvement on most measures clearly favored the ACT group (see Table 2), the study was underpowered to statistically detect these more modest between-group differences. Other studies of CBT for psychosis generally have reported large effect size differences compared to TAU (Gould et al., 2001; Rector & Beck, 2002). However, inability to replicate these findings is not surprising considering differences in methodology, including the brevity of the intervention, heterogeneity of the sample, enhanced nature of the TAU condition, and control for extra therapist contact between groups in the current study.

Although 28% of the ACT group in contrast to 45% of the ETAU only group were rehospitalized after 4 months, this difference was not statistically significant. Bach and Hayes (2002) found similar rates of rehospitalization (20% vs. 40%) in their sample during the same follow-up period. Therefore, ACT resulted in a 50% reduction in rehospitalization relative to TAU

in the Bach and Hayes study, compared with a 38% reduction in the current study. Although some studies have reported that CBT can be effective in reducing rehospitalization rates (e.g., Bach & Hayes, 2002; Norman et al., 2002), others have found encouraging trends but not significant effects (e.g., Kuipers et al., 1997; Tarrier et al., 1999, 2004). Because of these equivocal findings, adjunctive psychosocial treatments that have the potential to decrease rehospitalization require further study using larger samples and longer follow-up periods (preferably 1 year or more).

Interestingly, believability of hallucinations only decreased post-treatment in the ACT group, and change in this domain covaried with change in distress after controlling for change in symptom frequency. Although not a formal mediation analysis, these findings suggest that hallucination believability and distress more strongly related over time than hallucination frequency and distress, making believability a potentially important target of intervention. These results are consistent with predictions from RFT (Hayes et al., 2001), upon which ACT is based. Future research should examine if this effect is specific to ACT or if it is a general feature of other effective treatments. For example, Teasdale et al. (2002) found that meta-cognitive awareness (i.e., the degree to which individuals experience negative thoughts/feelings as mental events rather than as the self) mediated future relapse in remitted depressed patients in both mindfulness and traditional cognitive therapy conditions.

Although results from the current study generally were comparable to those of Bach and Hayes (2002), variations in methodology likely resulted in some differences. Bach and Hayes found that the ACT group reported higher psychotic symptom frequency compared to the TAU group, comparable decreases in associated distress over time across the groups, but lower believability in psychotic symptoms compared to the TAU group. In the current study, hallucination frequency decreased comparably in both groups over time, the ACT group showed lower distress related to hallucinations, and believability significantly decreased only in the ACT group over time. It is important to note that in the current study, self-ratings of psychotic symptoms were collected at pre- and post-treatment, whereas in the Bach and Hayes study ratings were obtained at pre-treatment and 4-month follow-up.

Study strengths and limitations

The present study possessed several strengths, including randomization to conditions, use of standardized assessment measures, objective follow-up data, examination of clinical significance, and diverse sample demographics. Potential limitations also existed. Sample size was modest for detecting group differences, and several results were only marginally significant. It should be noted that ITT analyses based on the entire sample showed similar results as completer analyses. Furthermore, all trends, both significant and non-significant, favored the ACT group regardless of the assessment method used.

The number of ACT sessions patients received ranged from one to five, with the majority receiving three. The decision to vary treatment length was made to better reflect the way treatment typically is delivered in an inpatient environment, as length of stay varies dramatically between patients. A patient who was discharged after a few days may have received only one ACT session, whereas someone hospitalized for a several weeks may have received as many as five sessions.

In the current study, assessors and staff were not blind to treatment allocation. Also, it is possible that demand characteristics influenced self-report ratings of psychotic symptoms, as they

were collected at the same time as the assessment interview. However, it is important to note that outcome was assessed in a multi-modal fashion and included self-report, clinician ratings, and objective measures. Regardless of method used, results consistently favored the ACT group, and even when significant differences were not found, the trend was similar.

Furthermore, the therapist at times also acted as the assessor at post-treatment in both conditions. In order to reduce potential bias in ratings, the ACT therapist met frequently with participants in the ETAU only condition, who considered the ACT therapist to be their therapist as well. Also, interrater agreement collected on a subsample of clinician ratings was high, suggesting reliable administration of measures. Nevertheless, bias cannot be ruled out as an influence in observed group differences on clinician ratings.

One strength of the current study was the ethnic diversity of the sample. In the [Bach and Hayes \(2002\)](#) study, 75% were Caucasian, compared with 88% African-American in the current study. Furthermore, the sample was comprised of a relatively severe group of patients, even by inpatient standards. During the short 4-month follow-up period, rehospitalization rates were nearly 50% in the TAU condition. Comorbid substance use disorders were found in 58% of the current sample, compared with 19% in the Bach and Hayes study. There is some evidence that CBT may be useful for patients with such comorbidity. [Barrowclough et al. \(2001\)](#) showed benefits using an integrated CBT approach in a comorbid sample of patients with schizophrenia and substance use disorders. Many patients in the current study were homeless, possessed serious comorbid medical and psychiatric conditions, and had lower educational attainment. ACT was able to flexibly treat a diverse and severe sample of comorbid patients with minimal alterations to the standard protocol.

Nevertheless, the more unique the sample, the less generalizable results are to other populations or studies in this area. Although pre-treatment scores were used as covariates in analyses, the gender distribution between treatments was unequal. Examination of pre-treatment scores showed that males and females may have exhibited somewhat different symptom presentations. To statistically control for this, pre-treatment scores were used as covariates in the analyses. Furthermore, fewer participants in the current study self-reported prominent delusions relative to hallucinations, similar to in other studies of psychiatric inpatients ([Read & Argyle, 1999](#)). Therefore, results may be most applicable to individuals experiencing hallucinations in the context of an acute psychiatric episode. Finally, generalizability to schizophrenic populations specifically may be limited due to the mixed diagnostic status of participants in both the [Bach and Hayes \(2002\)](#) and current studies.

Implications and future directions

The current study was not designed to support the conclusion that ACT is a specifically efficacious treatment for psychotic disorders, as the comparison group used did not control for many non-specific treatment factors, such as treatment type, credibility, novelty, etc. Instead, the purpose was to develop a feasible intervention that could be implemented in the short-term treatment of inpatients with psychotic symptoms. Both patient and treatment provider response to the intervention was overwhelmingly positive, and it was not associated with any adverse events.

Results of the [Bach and Hayes \(2002\)](#) trial suggested that additional treatment was beneficial for reducing future rehospitalization in patients. The current study extended these findings to

suggest that modified cognitive-behavioral treatment, even if brief, may be helpful for improving short-term coping with psychotic symptoms compared to milieu therapy on an inpatient unit. Based on these preliminary but suggestive findings, future studies with larger samples are warranted. Furthermore, future trials should begin to examine systematically the relative efficacy and feasibility of CBT, ACT, and other empirically supported treatments for psychosis, including different delivery formats (Gaudiano, 2005).

In the current study, change in believability covaried strongly with hallucination-related distress, even after controlling for the variance attributable to hallucination frequency. This suggests the importance of targeting believability in hallucinations in contrast to their frequency alone. Both ACT and more traditional cognitive-behavioral therapies for psychosis may help patients to decrease the believability of distressing thoughts and emotions that can interfere with goal-directed behavior. In contrast to the concurrent assessment approach used in the present study, future research should assess these variables in a prospective manner to establish the temporal relationships that can identify possible mediation effects (Holmbeck, 1997). Specifically, variables such as psychotic symptom frequency, believability, and distress would need to be assessed at different time points during the study (e.g., baseline, pre-treatment, mid-treatment, post-treatment, and follow-up).

Finally, alternate explanations for the observed effects deserve further consideration. Recently, several studies have reported positive results using briefer CBT formats for psychosis (Bach & Hayes, 2002; Chadwick, Sambrooke, Rasch, & Davies, 2000; Turkington et al., 2002; Wykes, Parr, & Landau, 1999). Lambert (in press) argues that early treatment response suggests the role of non-specific treatment factors, as the effect is produced before the patient would be expected to practice and to obtain the positive benefits from the coping skills taught in sessions. However, alternative explanations for early treatment response also exist (e.g., Fennel & Teasdale, 1987; Renaud et al., 1998). Future studies will require the use of comparison conditions that better control for non-specific treatment factors to demonstrate specificity of these treatments for psychosis. Furthermore, the examination of process measures during early phases of treatment may help in the separation of specific and non-specific effects.

Conclusion

The United Kingdom's National Institute for Clinical Excellence (2002) guidelines for the treatment of schizophrenia lists CBT as one of the few empirically supported psychotherapies. However, in the US, results of a recent study by the APA's Practice Research Network showed that individuals in Medicaid or Medicare programs and those over 65 rarely receive *any* psychosocial treatment in addition to medication for the treatment of schizophrenia. Overall, only 21% of the 151 adults with schizophrenia studied were receiving a CBT-type intervention (Moran, 2003). The current study provides preliminary support for the usefulness and feasibility of mindfulness/acceptance-based CBT approaches for psychosis. Further controlled research using larger samples will be necessary before these newer variations of CBT should be provided as standard treatment. Nevertheless, the ability to adapt ACT easily for acute-treatment settings in a heterogeneous patient group is promising, and future research will help to determine whether ACT possesses advantages over traditional CBT for this population.

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