

**Cognitive behaviour therapy for anxiety in psychosis: A  
systematic review and meta-analysis**

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## **Abstract.**

**Background:** Anxiety is common in people with psychosis. Cognitive Behaviour Therapy (CBT) is an effective treatment for anxiety in people without psychosis. Given the prevalence of anxiety in those with psychosis, the efficacy of CBT in this population is important to consider. This review and meta-analysis therefore investigates the efficacy of CBT for anxiety in people with psychosis.

**Method:** Twenty-nine studies were identified through systematic review, including controlled, uncontrolled and case report designs. Seventeen controlled and uncontrolled studies were included in the quantitative synthesis.

**Results:** A medium, significant effect was found at post-treatment and follow-up when controlled and uncontrolled data were combined. For controlled between-groups data only, a small, significant effect was found at post-treatment and follow-up. The effect of CBT for anxiety on psychotic symptoms was investigated, resulting in a medium, significant effect for controlled and uncontrolled post-treatment data and a small, significant effect for controlled between-group data.

**Conclusions:** CBT might have some effect in treating anxiety in people with psychosis. However, this review highlights a lack of scientifically rigorous studies in this area. Further research is required, including the use of well-designed randomised controlled trials (RCTs).

**Keywords:** psychosis; schizophrenia; anxiety; cognitive behaviour therapy; systematic review, meta-analysis

## **Introduction**

Anxiety is common in people with psychosis, resulting in distress and poor clinical outcomes (Pallanti et al., 2004). Although anxiety may be understood as a response to the experience of psychosis, it can also predate psychosis and present as co-morbid conditions (Howells et al, 2017). Achim et al. (2011) found that 38.3% of individuals with schizophrenia also met criteria for at least one anxiety disorder. Rates varied, with social anxiety being the most prevalent at 14.9%, followed by post-traumatic stress disorder (PTSD; 12.4%) and obsessive compulsive disorder (OCD; 12.4%).

The role of anxiety is highlighted in cognitive-behavioural models of psychosis. Garety et al. (2001) suggest that anxiety leads to a ‘search for meaning’ in relation to psychotic symptoms, resulting in interpretations associated with threat. In support, Freeman et al. (2002) note that psychological processes involved in anxiety, such as threat, are implicated in the content of persecutory delusions. In further support, Morrison’s (2001) model describes psychotic symptoms as ‘intrusions into awareness’ and argues that these intrusions are maintained by common anxiety processes, such as attentional bias, safety behaviours and thought suppression.

Cognitive Behaviour Therapy (CBT) has been shown to be effective for anxiety in people without psychosis. In a meta-analysis of randomised placebo-controlled trials of CBT for anxiety disorders, Hofmann and Smits (2008) reported a

pooled effect size of 0.73 (95% confidence interval (CI), 0.88-1.65). Effect sizes ranged from 0.35 for panic disorder to 1.37 for OCD. More recently, Carpenter et al. (2018) found a pooled effect size of 0.56, with a small effect on quality of life (Hedges'  $g = 0.30$ ). As found by Hofmann and Smits (2008), the largest effects were found in studies of CBT for OCD (Hedges'  $g = 1.13$ , 95% CI = 0.58-1.68,  $p < .001$ ).

Whilst systematic reviews and meta-analyses investigating CBT for different types anxiety have been conducted (e.g. OCD; Schirmbeck and Zink, 2013; Tundo and Necci, 2016; PTSD; Brand et al., 2017; Sin and Spain, 2016; Sin et al., 2017; Swan et al., 2017; social anxiety; Michail et al., 2017), no meta-analysis has explored the effectiveness of CBT across the range of anxiety presentations in people with psychosis. A number of systematic reviews have investigated CBT for anxiety in people with psychosis (Braga et al., 2013; Opoka and Lincoln, 2017; Opoka et al., 2018). However, these include limited search strategies and omit relevant studies. The current study aims to extend and update these reviews and use a meta-analysis to explore the pooled effect size. Given the potential role of anxiety in psychosis, we are also interested in examining the impact of CBT for anxiety on psychotic symptoms.

## **Methods**

### ***Protocol and registration***

The review was registered with the International Prospective Register of Systematic Reviews (PROSPERO). Registration number CRD42017056250, [http://www.crd.york.ac.uk/PROSPERO/display\\_record.php?ID=CRD42017056250](http://www.crd.york.ac.uk/PROSPERO/display_record.php?ID=CRD42017056250).

### ***Search strategy***

Studies were identified via CINAHL Complete, MEDLINE (EBSCO), PsycINFO (EBSCO) and Web of Science. The Cochrane Database of Systematic Reviews, the UK Clinical Research (UKCRN) Study Portfolio and the ISRCTN Registry were also searched. Reference lists were scanned for studies not found electronically.

Literature was searched from the date of inception until 12<sup>th</sup> November 2018. Automatic alerts were used to identify studies following the database search. The following search terms were used: cognitive behavio\* (therap\* OR treatment\* OR intervention\*) OR cognitive (therap\* OR treatment\* OR intervention\*) OR behavio\* (therap\* OR treatment\* OR intervention\*) OR CBT AND psychosis OR psychotic OR schizo\* OR hallucination\* OR delusion\* OR paranoi\* AND anxi\* OR OCD OR "obsessive-compulsive" OR obsession\* OR compulsion\* OR panic OR agoraphobi\* OR "acute stress" OR PTSD OR "post-trauma\*" OR "posttrauma\*" OR GAD OR "general\* anxi\*" OR worr\* OR phobi\* OR "social\* anxi\*" OR "social\* phobi\*".

### ***Inclusion and exclusion criteria***

Studies were included in the review if they met the following criteria: (1) full text articles in English; (2) randomised controlled trials (RCTs), open trials and case reports; (3) investigating a type or component of CBT; (4) participants (all ages) with a diagnosis of psychosis (including an episode of psychosis, schizophrenia spectrum disorder or mood disorder with psychotic features) or clinically significant levels of psychotic symptoms; (5) participants with a diagnosis of anxiety (as per search terms noted above) or clinically significant levels of anxiety symptoms. For studies with

‘severe mental illness’ samples, only data for participants with psychosis were included, when provided by the corresponding author(s).

Exclusion criteria were as follows: (1) studies primarily focused on ‘at risk’ or ‘ultra high risk’ populations; (2) investigation of stand-alone ‘third-wave’ interventions (e.g. compassion focused therapy, mindfulness); (3) anxiety was not the primary outcome measure; (4) no standardized measure of anxiety was used. Case reports were included in the review to provide an overview of the existing evidence base. However, they were not included in the quantitative synthesis.

### ***Risk of bias***

The Cochrane risk of bias tool (Higgins et al., 2011) was used to assess risk of bias within controlled and uncontrolled studies. A rating of ‘low’, ‘high’, or ‘unclear’ risk was provided for random sequence generation; allocation concealment; blinding of outcome assessors, incomplete outcome data; selective outcome reporting.

### ***Data analysis***

Comprehensive Meta-analysis 3.0 was used to analyse data from controlled and uncontrolled trials. Effect sizes (Hedges’  $g$ ), the 95% CI and  $p$  value were computed using means and standard deviations (SD), standard error or Cohen’s  $d$ . A random effects model was used to account for potential heterogeneity.

The primary outcome was anxiety severity and the secondary outcome was psychotic symptom severity. For controlled trials, between-group post-treatment means and SD were used. For uncontrolled trials, pre-post means and SD were used. To enable inclusion of controlled and uncontrolled trials in the same analysis, pre-post

means and SD were also used for the treatment group for controlled trials. Pre-treatment to follow-up and between-groups follow-up data (including follow-ups conducted up to six months post-treatment) were used to investigate treatment efficacy over time. Additional analyses were conducted for each type of anxiety using the pre-post data for all studies and between-group data for the controlled trials.

Where repeated measures correlations were not available, a conservative estimate of 0.7 was used, as suggested by Rosenthal et al. (1993). Heterogeneity was assessed using  $I^2$ . As suggested by Higgins et al. (2003), an  $I^2$  statistic of 25% or less was considered low, 50% was considered moderate and 75% was considered high. Publication bias was assessed by visual inspection of funnel plots and Fail-safe N.

Where data were available, reliable and clinical change were calculated for anxiety and psychosis data in the case reports at post-treatment and (up to six months) follow-up using standardised formula (Jacobson et al., 1984; Jacobson and Truax, 1991). As suggested by Wise (2004), outcomes were summarised as follows: reliable and clinical change (Recovered); reliable or clinical change (Improved); no reliable or clinical change (Unchanged); reliable change in a negative direction (Deteriorated).

## **Results**

### ***Search results and study selection***

The study selection process is outlined in Figure 1. The initial search identified 4617 papers, of which 1408 were duplicates. Twenty-nine studies were included in the review and 17 controlled and uncontrolled trials were included in the quantitative

synthesis. Secondary outcome data for van den Berg et al. (2015) was also included in the quantitative synthesis, extracted from de Bont et al. (2016).

Some raw data for participants with psychosis from ‘severe mental illness’ samples were not suitable for inclusion due to insufficient participant numbers (Lu et al., 2012) or no information about diagnosis (Lu et al., 2009; Mueser et al., 2007; Rosenberg et al., 2004). Another study was excluded from the quantitative synthesis due to insufficient data to calculate effect size (Trappler and Newville, 2007).

### ***Study characteristics***

Study characteristics are outlined in Tables 1 and 2. Of the 29 studies included in the review, nine are controlled trials, eight are uncontrolled trials and 12 are case reports. The 17 studies in the quantitative synthesis involved 664 participants. The most studied type of anxiety was PTSD (n = 7), followed by social anxiety (n = 4), worry (n = 3), OCD (n = 1), panic disorder (n = 1) and anxiety (n = 1). For the controlled studies comparisons were typically made between CBT and treatment as usual (TAU) or wait-list (n = 8). One study (Mueser et al., 2015) compared CBT to a brief intervention including relaxation and psychoeducation. The 12 case reports included 15 participants. Most reports investigated CBT for PTSD (n = 5), followed by OCD, (n = 3), social anxiety (n = 2), panic disorder (n = 1) and specific phobia (n = 1).

Most studies used individual CBT (n = 22) but some used group CBT (n = 6). One study (Freuh et al., 2009) used both individual and group CBT (four vs. eight sessions). Treatment length varied from three (Hagen et al., 2014) to 66 sessions (Keen et al., 2017). Most studies (n = 22) used both cognitive and behavioural components. Two studies (Grubaugh et al., 2016; van den Berg et al., 2015) used

Prolonged Exposure (PE), two studies (Marcello et al., 2009; Mueser et al., 2015) used Cognitive Restructuring (CR), one study used written elaboration and CR (Kevan et al., 2007), one study used systematic desensitisation (Dudley et al., 2005) and one study used Exposure and Response Prevention (ERP; Ekers et al., 2004). Within a programme of CBT, two studies used Imagery Rescripting (ImRs; Callcott et al., 2004; Kayrouz et al., 2015) and one study used Virtual Reality (Gega et al., 2013).

### ***Risk of bias assessment***

Risk of bias assessment for the controlled and uncontrolled studies is displayed in Table 1. For the controlled studies, risk of bias was mostly low or unclear. Risk of bias varied across the uncontrolled studies, but was mostly high.

### ***Synthesis of results***

Effect size (Hedges'  $g$ ), the 95% CI,  $p$  values and  $I^2$  for each of the outcomes are shown in Table 3. Forest plots are displayed in Figure 2.

### ***Primary outcomes***

A medium effect was found for the pre-post controlled and uncontrolled anxiety data. However, when only between-group controlled study data were included, a small effect was found. Heterogeneity was moderate to high for the pre-post data, but reduced to low to moderate when only between-group data were included.

Effect size for pre-post controlled and uncontrolled data ranged from medium for panic disorder to large for clinical anxiety. For between-group controlled data, effect size ranged from small for PTSD to medium for social anxiety. At follow-up, a

medium effect was found for pre-post data and a small effect was found for between-group data. Again, heterogeneity was moderate to high for pre-post data, but reduced to low to moderate when only between-group data were included.

### ***Secondary outcomes***

A medium effect was found for the pre-post controlled and uncontrolled psychosis data. When only the between-group controlled study data were included, a small effect was found. Heterogeneity was moderate to high for the pre-post data and low when only the between-groups data were included.

### ***Publication bias***

Visual inspection of funnel plots did not reveal significant asymmetry for anxiety. For anxiety at post-treatment for the pre-post data, Fail-safe N revealed that 1110 ‘null’ studies would be needed to bring the overall treatment effect to non-significance. However, for the between-group data, Fail-safe N revealed that only 19 ‘null’ studies would be needed to bring the overall treatment effect to non-significance.

### **Discussion**

This review identifies 29 studies that investigate CBT for anxiety in psychosis, with a total of 679 participants. Controlled (n = 9) and uncontrolled (n = 8) studies and case reports (n = 12) were included to provide an overview of the evidence base. Overall, this work highlights the paucity of scientifically rigorous studies in this area. Of the 29 studies included in the review, the following types of anxiety were represented: PTSD (n = 12); social anxiety (n = 6); worry (n = 3); OCD (n = 4), panic disorder (n = 2); clinical anxiety (n = 1) and specific phobia (n = 1).

The quantitative synthesis resulted in a pre-post effect size of 0.74 and a between-groups effect size of 0.35. The between-groups effect size is smaller than those reported in meta-analyses of CBT for anxiety in people without psychosis (i.e. Carpenter et al., 2018; Hedges'  $g = 0.56$ ; Hofmann and Smits, 2008; Hedges'  $g = 0.73$ ). Although this suggests that CBT for anxiety is less effective in psychosis compared to those without psychosis, only a small number of between-groups studies were available. Although a larger effect size was found for pre-post data, high heterogeneity was found. This is expected given variation in methodology across studies, but suggests these data should be interpreted with caution.

For psychotic symptoms, a medium effect size of 0.57 for pre-post data and a small effect size of 0.37 for between-group data was found. Although the latter finding suggests that CBT for anxiety only has a small effect on psychotic symptoms, a limited number of studies were used in the analysis ( $n = 6$ ). As with the anxiety data heterogeneity was moderate to high for the pre-post data. Again, this is expected given varied methodology, but it should be considered in interpretation.

Only 13 out of the 29 studies included in the review used measures of psychosis. Although the aim of the studies was not to target psychotic symptoms, including measures of psychosis is important. Omitting such measures means that the overall impact of CBT for anxiety in people with psychosis will not be clear.

### ***Limitations***

Despite a comprehensive review, only a small number of controlled studies were found. Most studies were uncontrolled trials or case reports, limiting the conclusions that can be drawn. A high risk of bias was found in the uncontrolled studies and high

heterogeneity was found in the combined pre-post data and data for the different types of anxiety. Furthermore, only a small number of data were available for psychotic symptoms and follow-up.

### ***Future research***

Despite the prevalence and impact of anxiety in people with psychosis, the number of scientifically rigorous studies in this area is low. It is hoped that this work will encourage further research, including well-designed RCTs. The majority of studies identified investigated CBT for PTSD or social anxiety. It is hoped that interested researchers will investigate CBT for other types of anxiety in people with psychosis.

Interestingly, the between-groups effect size found in this meta-analysis is similar to the effect sizes found in meta-analyses investigating CBT for psychosis (e.g. Jauhar et al., 2014, 0.33; van der Gaag et al., 2014, 0.36 for delusions, 0.44 for hallucinations; Wykes et al., 2008, 0.40). It is possible that in people with psychosis CBT is as effective for anxiety as it is for psychotic symptoms. However, due to the lack of scientifically rigorous studies investigating CBT for anxiety in psychosis, this is not clear. Further research is required to gain a better understanding of the efficacy of CBT for anxiety in people with psychosis.

### ***Conclusion***

This is the first meta-analysis investigating CBT for anxiety in people with psychosis. The review provides an overview of the current evidence base, but in doing so highlights the paucity of scientifically rigorous studies in this area. Further research, including well-designed RCTs, is clearly warranted.

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## **Complying with ethics of experimentation**

No studies with human participants or animals were performed by the authors.

## **Consent**

It was not possible or necessary to gain informed consent from any participants.

## **Health and safety**

No experimental work was conducted by the authors.

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Table 1. Study characteristics (controlled and uncontrolled trials).

Author	Design	N	Diagnoses	Mean age (SD) <sup>a</sup>	% Male <sup>b</sup>	Treatment	Max no. of sessions (mean)	Control group	% attrition <sup>c</sup>	Outcome measures used	Follow-up (months) <sup>d</sup>	Risk of bias
<i>Controlled trials</i>												
Foster et al. (2010)	RCT	24	Schizophrenia/schizoaffective disorder/delusional disorder and worry	40.0 (10.0)	58	CBT	4 (*)	TAU	16.7	PSWQ PSYRATS - delusions	2	L L H H L
Freeman et al. (2015)	RCT	150	Schizophrenia/schizoaffective disorder/ delusional disorder and worry	40.9 (10.5)	58	CBT	6 (5.5)	TAU	6	PSWQ PSYRATS- delusions	4	L L U L L
Halperin et al. (2000)	RCT	16	Schizophrenia and social anxiety	39.6 (*)	81.3	CBGT	8 (*)	Waitlist	0	BSPS	1.5	U U U H L
Kingssep et al. (2003)	RCT	33	Schizophrenia and social anxiety	* (*)	69.7	CBGT	13 (*)	Waitlist	24.2	SIAS	2	U U L H L
Isham et al. (2018)	RCT	13	Schizophrenia-spectrum disorder and worry	48.0 (*)	*	CBGT	8 (5.7)	Waitlist	7.69	PSWQ PSYRATS - delusions	1	U U H L L
Mueser et al. (2008) <sup>e</sup>	RCT	17	Schizophrenia/schizoaffective disorder and PTSD	44.2 (10.6)	21.3	CBT	12-16 (*)	TAU	49.1	CAPS	6	L L L L L
Mueser et al. (2015) <sup>e</sup>	RCT	67	Schizophrenia/schizoaffective disorder and PTSD	43.0 (10.5)	33	CR	12-16 (*)	Brief intervention	22.4	CAPS PANSS (Positive)	6, 12	L L L L L

Steel et al. (2016)	RCT	61	Schizophrenia/schizoaffective disorder and PTSD	42.3 (10.2)	62.3	CBT	16 (12.3)	TAU	23	CAPS-S PANSS (Positive)	6	L L L H L
van den berg et al. (2015)	RCT	155	Schizophrenia spectrum/psychotic disorders and PTSD	41.2 (10.5)	45.81	PE	8 (7.1)	Waitlist	17.4	CAPS PSYRATS - delusions	6	L L L L L
<i>Uncontrolled trials</i>												
Arlow et al. (1997)	OT	8	Schizophrenia and panic disorder	38 (*)	75	CBGT	16 (16)	N/A	27.28	WASPA	0	H H H H L
Freuh et al. (2009)	OT	20	Schizophrenia/schizoaffective disorder and PTSD	42.3 (8.4)	25	CBT (4 sessions) and CBGT (8 sessions)	22 (17.1)	N/A	35	CAPS	3	H H H H U
Gega et al. (2013)	OT	6	Psychosis and social phobia	* (*)	100	CBT with VR	12	N/A	0	SIAS GPTS	3	H H H L L
Grubaugh et al. (2016)	OT	34	Psychotic disorder/bipolar disorder or mood disorder with psychotic features and PTSD	47.8 (13.4)	88.2	PE	10-15 (7.2)	N/A	*	CAPS	6	H H U H L
Keen et al. (2017)	OT	9	Psychosis and PTSD	37 (11.3)	56	CBT	25-66 (median = 41)	N/A	22	PDS PSYRATS - delusions	6	H H H L L
Montreuil et al.	OT	29	Psychosis (n = 23)/ARMS (n = 6) and social anxiety	* (*)	*	CBGT	14 (12)	N/A	10	SIAS SAPS	6	H H U H L

(2016)												
Tundo et al. (2014)	OT	21	Schizophrenia/schizoaffective disorder and OCD	29 (5.4)	61.9	CBT	8-41 (34.3 schizophrenia; 31.1 schizoaffective)	N/A	24	Y-BOCS	12	H H U L L
Welfare-Wilson and Newman (2013)	OT	7	Psychosis and anxiety	25 (*)	57	CBGT	12 (12)	N/A	0	DASS-21	3	H H H H L

Note: \* = data not available, ARMS = At-Risk Mental State; BSPS = Brief Social Phobia Scale, CAPS = Clinician Administered PTSD Scale, CAPS-S = Clinician Administered PTSD Scale for Schizophrenia, CBT = Cognitive behavioural therapy, CBGT = Cognitive behavioural group therapy, CR = Cognitive Restructuring, DASS-21 = Depression, Anxiety, Stress Scale – Short Form, GPTS = Green et al. Paranoid Thoughts Scale, H = High, L = Low, N/A = not applicable, OCD = obsessive compulsive disorder, OT = open trial, PANSS = Positive and Negative Syndrome Scale, PDS = Post-traumatic Diagnostic Scale, PE = Prolonged Exposure; PSYRATS = Psychotic Symptom Rating Scales, PSWQ = Penn State Worry Questionnaire, PTSD = post-traumatic stress disorder, RCT = randomised controlled trial, SAPS = Scale for the Assessment of Positive Symptoms, SIAS = Social Interaction Anxiety Scale, TAU = Treatment as usual, U = Unclear, VR = Virtual Reality, WASPA = Westergaard Assessment Scale for Panic Attacks, Y-BOCS = Yale-Brown Obsessive Compulsive Scale.

<sup>a, b</sup> Whereby mean age and gender data presented for intervention and control group only, intervention data are used.

<sup>c</sup>% attrition based on longest follow-up data available.

<sup>d</sup>Longest follow-up point recorded.

\*Only participants with psychosis were included in the quantitative synthesis. The data presented in the table are for the full sample, as raw data on these characteristics were not made available.

Table 2. Study characteristics (Case reports).

Study	N	Diagnoses	Age	Gender	Treatment	No. of sessions	Outcome measures used	Follow-up (months)	Clinical change	Reliable change	Outcome
Callcott et al. (2004)	1	Psychosis and PTSD	34	F	CBT with ImRs	17	IES SANS	0	* *	* *	N/A
Dudley et al. (2005)	1	Paranoid schizophrenia and specific phobia	38	M	Systematic desensitisation	38	MIA PSYRATS	6	* *	* *	N/A
Ekers et al. (2004)	1	Schizophrenia and OCD	31	M	ERP	20	Y-BOCS	6	Y <sup>b</sup>	Y <sup>b</sup>	Recovered
Good (2002)	1	Schizophrenia and social phobia	*	M	CBT	16	MFQ Agoraphobia Social phobia KGV	2	Y <sup>c</sup>  Y <sup>c</sup>  *	Y <sup>c</sup>  Y <sup>c</sup>  *	Recovered  Recovered  N/A
Gruber et al. (2006)	1	Psychosis and panic disorder with agoraphobia	*	M	CBT	19	BAI	3	Y <sup>d</sup>	Y <sup>d</sup>	Recovered
Hagen et al. (2014)	1	Paranoid schizophrenia and OCD	Late 20's	M	CBT with ERP	3	Y-BOCS	6	Y <sup>e</sup>	Y <sup>e</sup>	Recovered
Hamblen et al. (2004) <sup>a</sup>	2	Bipolar with psychotic features/schizoaffectiv	43, 56	F, M	CBT	16, 16	CAPS	3, 3	*	*	N/A

		e									
		disorder/schizophrenia and PTSD									
Kayrouz et al. (2015)	1	Paranoid schizophrenia and PTSD	53	M	CBT with ImRs	19	IES-R	0	Y	*	Improved
Kevan et al. (2007)	1	Schizophrenia and PTSD	31	F	Written trauma elaboration and CR	7	PDS	1	Y <sup>f</sup>	Y <sup>f</sup>	Recovered
Kobori et al. (2008)	1	Schizophrenia and OCD	26	M	CBT	18	Y-BOCS	0	Y	Y	Recovered
Marcello et al. (2009)	1	Schizoaffective disorder and PTSD	In 50's	M	CR	16	PCL-S	0	Y	Y	Recovered
Williams et al. (2015)	1	Paranoid schizophrenia and social anxiety	22	M	CBT	20	LSAS IHS	0	Y N	Y Y	Recovered Improved

Note: \* = data not available to calculate reliable and/or clinical change, BAI = Beck Anxiety Inventory, CAPS = Clinician Administered PTSD Scale, CBT = Cognitive Behavioural Therapy, CR = Cognitive Restructuring, ERP = Exposure and Response Prevention, F = female, IES = Impact of Events Scale, IES-R = Impact of Events Scale – Revised, IHS = Inventory of Hostility and Suspiciousness, ImRs = Imagery Rescripting, KGV = Krawiecka Goldberg Vaughan Scale, LSAS = Liebowitz Social Anxiety Scale, M = male, Mobility Inventory for Agoraphobia, MFQ = Modified Fear Questionnaire, N = No, N/A = Not applicable, OCD = obsessive compulsive disorder, PDS = Post-traumatic Diagnostic Scale, PCL-S = PTSD Checklist - Stressor specific version, PSYRATS = Psychotic Symptom Rating Scales, PTCI – Post-traumatic Cognitions Inventory, PTSD = post-traumatic stress disorder, SANS = Scale for the Assessment of Negative Symptoms, Y = Yes, Yale-Brown Obsessive Compulsive Scale.

<sup>a</sup>Only two cases used as the first participant did not have a diagnosis of psychosis.

<sup>b</sup>Clinical change significant only at six month follow-up and not post-treatment.

<sup>c</sup>Reliable and clinical change found at post-treatment and eight week follow-up.

<sup>d</sup>Reliable and clinical change found at post-treatment and three month follow-up.

<sup>e</sup>Reliable and clinical change calculated from six-month follow-up data (post-treatment data not presented).

<sup>f</sup>Total symptom severity on the PDS used to calculate reliable and clinical change.

Table 3. Results from the quantitative synthesis.

Study Design	Time Point	Division criteria	Outcome	N	Study codes	Hedges' g	95% CI	p	I <sup>2</sup> (%)
Within-group (pre-post analysis)	End of treatment	All studies	Primary measure of anxiety	17	All studies	0.74	0.56, 0.92	<.001	73.25
		All studies	Positive psychotic symptoms	9	De Bont, Foster, Freeman, Gega, Isham, Keen, Montreuil, Mueser, Steel	0.57	0.36, 0.78	<.001	65.31
		Type of anxiety	PTSD	7	Frueh, Grubaugh, Keen, Mueser, Mueser, van den Berg, Steel	0.70	0.37, 1.03	<.001	82.97
		Social Anxiety/Social Phobia	4	Gega, Halperin, Kingsep, Montreuil	0.71	0.39, 1.02	<.001	57.98	
		Worry/GAD	3	Foster, Freeman, Isham	0.70	0.20, 1.20	.006	77.19	
		Panic	1	Arlow	0.66	0.12, 1.20	.017	0	
		OCD	1	Tundo	1.06	0.65, 1.46	<.001	0	
	Anxiety NOS	1	Welfare-Wilson	1.14	0.46, 1.83	.001	0		
	Follow-up (1- 6 mths)	All studies	Primary measure of anxiety	12	Foster, Freeman, Frueh, Gega, Grubaugh, Isham, Keen, Montreuil, Mueser, Steel, Tundo, van den Berg	0.78	0.56, 0.99	<.001	73.80
	Between-group (RCTs)	End of treatment	All controlled studies	Primary measure of anxiety	9	All controlled studies	0.35	0.07, 0.64	.015
All controlled studies			Positive psychotic symptoms	6	de Bont, Foster, Freeman, Isham, Mueser, Steel	0.37	0.16, 0.57	<.001	0

	Type of anxiety	PTSD	4	Mueser, Mueser, van den Berg, Steel	0.09	0.50, 0.67	.771	63.10
		Social Anxiety/Social Phobia	2	Halperin, Kingsep	0.58	0.03, 1.14	.041	0
		Worry/GAD	3	Foster, Freeman, Isham	0.54	0.25, 0.84	<.001	0
Follow-up (1-6 mths)	All controlled studies	Primary measure of anxiety	6	Foster, Freeman, Isham, Mueser, Steel, van den Berg	0.34	0.05, 0.63	.022	40.88

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