A systematic review and meta-analysis of low intensity CBT for psychosis☆

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HIGHLIGHTS

- 16+ sessions of CBT for psychosis is recommended, but this is not widely available.
- A meta-analysis of low intensity (i.e. fewer sessions) CBT for psychosis is reported.
- Small–medium between-group effects were found for psychosis symptoms at post-therapy.
- Small–medium between-group effects for psychosis symptoms remained at follow-up.
- Effects were not moderated by study quality or therapist contact or therapy format.

ARTICLE INFO

ABSTRACT

Sixteen sessions of individual cognitive behavior therapy for people with psychosis (CBTp) is recommended. However, access to CBTp is poor, so the potential of low intensity CBTp (fewer than 16 sessions of face-to-face contact) is being explored. A systematic review and meta-analysis was conducted of 10 controlled trials evaluating low intensity CBTp. Significant between-group effects were found on the primary outcome, symptoms of psychosis, at post-intervention ($d = -0.46$, 95% CI: -0.06, -0.86) and follow-up ($d = -0.40$, 95% CI: -0.06, -0.74). Study quality did not moderate post-intervention psychosis outcomes, nor did contact time/number of sessions or therapy format (individual versus group). Between-group effects on secondary outcomes (depression, anxiety and functioning) were not significant at post-intervention, but became significant at follow-up for depression and functioning outcomes (but not for anxiety). Overall, findings suggest that low intensity CBTp shows promise with effect sizes comparable to those found in meta-analyses of CBTp more broadly. We suggest that low intensity CBTp could help widen access. Future research is called for to identify mechanisms of change and to ascertain moderators of outcome so that low intensity CBTp targets key mechanisms (so that scarce therapy time is used effectively) and so that interventions offered are matched to patient need.

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Contents

1. Introduction

A number of meta-analyses demonstrate benefits of cognitive behavioral therapy for psychosis (CBTp) (Gould, Mueser, Bolton, Mays, & Goff, 2001; Jauhar et al., 2014; Pfammatter, 2011; Pilling et al., 2002; Wykes, Steel, Everitt, & Tarrier, 2008; Zimmerman, Favrod, Trieu, & Pomini, 2005). Such findings led the UK National Institute for Health and Care Excellence (NICE) (2014) to recommend that CBTp should be offered to everyone with a psychotic disorder. The guideline states that CBTp should be delivered by qualified staff in an individual format and consist of a minimum of 16 sessions. These practice guidelines are endorsed internationally, for example, in the United States (National Guidelines Clearinghouse, 2009), and in Australia and New Zealand (RANZCP, 2004). Despite the clarity of the guidelines, access to CBTp is poor.

The most recent report by the UK's Schizophrenia Commission (2012) estimated that only 10% of people with psychosis are offered CBTp. The limited availability of CBTp could be explained by multiple factors, such as lack of trained staff, conflicts between service priorities and an emphasis in psychosis services on monitoring mental health rather than intervening (Berry & Haddock, 2008). Outside of the UK, a lack of appropriate health insurance (Chamberlin, 2004), and poor access to basic psychological health facilities (WHO, 2013) may be a further barrier to accessing psychological therapies.

The limited availability of CBT does not just apply to people with psychosis (Shafran et al., 2009) and attempts to address this have been widely discussed. Low intensity CBT interventions, which require fewer resources, may provide a partial solution (Bennett-Levy, Richards, & Farrand, 2010). Low intensity CBT interventions are effective for anxiety and depression (Andrews, Cuijpers, Craske, McEvoy, & Titov, 2010; Farrand & Woodford, 2013; Grist & Cavanagh, 2013) and, in the UK, are recommended by NICE (2011) for those with mild to moderate symptoms of anxiety and depression. Since 2008 low intensity CBT has been offered to people with mild to moderate symptoms of anxiety and depression as part of the UK's Improving Access to Psychological Therapies (IAPT) initiative with some success (Clark, 2011; Clark et al., 2009; Department of Health, 2012).

In order to address the poor access to CBTp for those with psychosis, a similar approach could be applied. Indeed, interest concerning the feasibility and effectiveness of low intensity interventions for those with psychosis is growing, and a UK pilot is currently underway (Jolley et al., 2015; Kingdon, 2013). Low intensity interventions may have the potential to be of benefit to a much larger population of people experiencing psychosis without increasing costs but their effectiveness is not well established.

Previous meta-analyses of CBTp have not systematically explored whether low intensity CBTp is effective and the aim of the current meta-analysis is to evaluate the effectiveness of low intensity CBTp (i.e. CBTp delivered in fewer than the NICE recommended 16 face-to-face therapy sessions). In line with meta-analyses of CBTp more broadly (e.g. Jauhar et al., 2014; Wykes et al., 2008) the primary outcome in this meta-analysis is symptoms of psychosis. Additional secondary outcomes of depression, anxiety and functioning are also examined. We will also investigate whether effects are moderated by study quality, therapist contact (hours/number of sessions) and therapy format (individual or group).

We plan to address the following questions: (1) Is low intensity CBTp (<16 contact hours) effective in improving psychosis symptoms in comparison to control conditions? (2) Is study quality associated with psychosis outcomes? (3) Is therapist contact (hours/number of sessions) associated with low intensity CBTp psychosis outcomes? and (4) Is the format of low intensity CBTp (group or individual) associated with psychosis outcomes? (5) Is low intensity CBTp effective in improving secondary outcomes of depression, anxiety and functioning?

2. Method

2.1. Literature search

A comprehensive search of the literature was conducted. Titles and abstracts were searched using PsycINFO, Web of Knowledge and Scopus databases for studies up to 10th December 2015 using the following terms: (COGNITIVE BEHAVIO* or COGNITIVE THERAPY or CBT) and (PSYCHOSIS or PSYCHOTIC or SCHIZO*).

All articles types were searched for, including dissertations, peer reviewed and non-peer reviewed studies. The studies included in two major meta-analyses of CBTp were screened for possible inclusion in this meta-analysis (Jauhar et al., 2014; Wykes et al., 2008). Both the Clinical Trials and ISRCTN research registers were searched to find

studies relevant to this meta-analysis that had recently finished or had not yet published. The reference sections of all papers that met inclusion criteria were also checked to identify any further studies.

2.2. Inclusion criteria

To be considered for inclusion in the meta-analysis: (1) the study tested the effectiveness of low intensity CBTp (defined as CBTp interventions designed with fewer than 16 sessions of face-to-face contact time); (2) the study was a controlled trial; (3) participants were diagnosed with a psychotic disorder (as defined by NICE guidelines (2014)), according to either DSM (American Psychiatric Association, 2013) or ICD (WHO, 1992) criteria; (4) the study included at least one quantitative measure of the following: psychosis, depression, anxiety, or functioning; and (5) the empirical paper or dissertation must be available in English.

2.3. Exclusion criteria

Studies were excluded from the meta-analysis if: (1) CBTp was integrated with another psychological intervention, as it would not be possible to attribute outcomes to CBTp alone; (2) substance misuse was the primary mental health disorder; and (3) an effect size could not be obtained from either data provided in the paper or from unpublished data obtained from the authors. Fig. 1 shows the PRISMA diagram detailing the process by which papers were screened and removed.

2.4. Data extraction

Post-intervention and follow-up (where available) means and standard deviations on primary and secondary outcomes were extracted for both intervention and control arms. We also coded multiple features of the therapy protocols. The number of contact hours was extracted; we defined this as the total amount of practitioner time spent directly delivering low intensity CBTp. Any direct face-to-face "booster sessions" that were used to deliver CBTp were included in the total contact time.

Interventions that delivered low intensity CBTp using alternative formats e.g. web-based CBTp, without any face-to-face contact were given a contact time of zero. Studies were also coded as to whether low intensity CBTp was delivered within a group or individually. Prescribed medication and study drop-out were also extracted.

2.5. Quality assessment

Downs and Black's (1998) index was used to assess the methodological robustness of studies included in the meta-analysis. This index includes 27 items within five categories (range 0–31): reporting, external validity, internal validity, selection bias and power, and was devised especially for research relating to healthcare interventions. A higher score reflects a study of higher quality. Studies were scored by the first author, and half were also rated by an independent researcher. There was substantial agreement between the two raters as per the criteria of Landis and Koch (1977) ($K = .79$).

2.6. Measures

Four outcomes were included in the meta-analysis. The primary outcome was psychotic symptom severity and secondary outcomes were depressive and anxiety symptom severity and functioning.

2.7. Meta-analysis procedure

The meta-analysis was conducted using SPSS version 20 (IBM, 2011). Post intervention between-group Cohen's d effect sizes were calculated (see Eqs. (1) and (2) in Appendix A). Effect sizes were weighted according to the guidance of Hedges and Ollkin (1985) (see Eq. (3) in Appendix A).

A random effects model with a restricted-information maximum likelihood estimate was used, in line with the recommendations of Viechtbauer (2005). The meta-analysis was conducted using SPSS macros by Lipsey and Wilson (Wilson, 2011).

ANOVA and regression meta-analytic analogs were used to test moderation hypotheses on psychosis outcomes. Number of contact
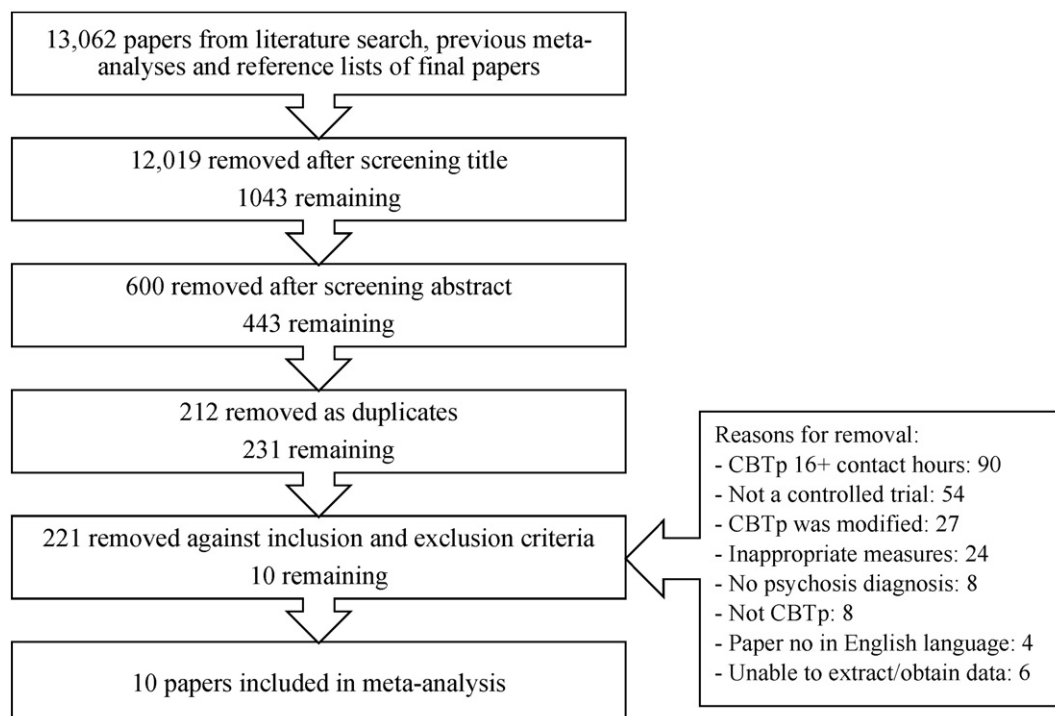

Fig. 1. PRISMA diagram detailing the literature search process, and reasons for study exclusion.

hours and number of sessions were entered as predictors into separate regression analysis to test their association with the effects of low intensity CBTp psychosis outcomes. ANOVAs were conducted comparing outcomes when low intensity CBTp was delivered in an individual or group format. Spearman's *rho* was calculated between study quality and low intensity CBTp psychosis symptom effect sizes.

Homogeneity analysis was carried out using the Q statistic. A significant Q value means that there is significant heterogeneity within the effect sizes, which was explored using the moderation analyses outlined above. Rosenthal's fail safe N and a funnel plot were used to test for publication bias. If data points on the funnel plot are unevenly distributed around the mean effect size, this indicates that publication bias might be present (i.e. that a disproportionate number of unpublished studies with non-significant effects might exist).

3. Results

The literature search produced a total of 13,062 papers (see Fig. 1). After screening titles and abstracts, and removing duplicates, 230 papers remained. Full text articles were then screened against the inclusion and exclusion criteria, leaving a total of 16. Where insufficient data were reported in the paper, all lead and corresponding authors were contacted at least three times to obtain data that could be used to calculate effect sizes. Six studies were removed due to insufficient data reported and appropriate data being unobtainable from the research team (this information is available from the first author on request). A final set of 10 studies remained and entered into the meta-analysis. The average quality score for these studies (using the Downs & Black, 1998) was 24.80 out of 31 (range: 18–29). See Table 1 for details of the final 10 studies.

The following outcome measures were included in the meta-analyses: (1) psychotic symptoms: Positive and Negative Syndrome Scale (PANSS) (Kay, Fiszbein, & Opler, 1987), psychotic symptom rating scales (PSYRATS) (Haddock, McCarron, Tarrier, & Faragher, 1999), Scale for the Assessment for Positive Symptoms (SAPS) (Andreasen, 1982); (2) depression: Beck Depression Inventory (BDI) (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), Beck Depression Inventory II (BDI II) (Beck, Steer, Ball, & Ranieri, 1996), Hospital Anxiety and Depression Scale (HADS) depression scale (Zigmond & Snaith, 1983); (3) anxiety: Beck Anxiety Inventory (BAI) (Beck, Epstein, Brown, & Steer, 1988), Hospital Anxiety and Depression Scale (HADS) anxiety scale (Zigmond & Snaith, 1983), Hamilton Anxiety Inventory (HAI) (Hamilton, 1959); (4) functioning: Personal and Social Performance Scale (PSP) (Morosini, Magliano, Brambilla, Ugolini, & Pioli, 2000), Social Functioning Scale (SFS) (Birchwood, Smith, Cochrane, Wetton, & Copestake, 1990), Social Behavior Scale (SBS) (Wykes & Sturt, 1986).

3.1. Participant characteristics

Across the 10 studies, a total of 631 participants were included: 315 received low intensity CBTp, and 316 received the control interventions. All of the participants were experiencing ongoing psychosis symptoms. The average of the reported mean participant age was 38.77 years and 35% were female. All participants in all studies were prescribed psychiatric medication, however we are unable to report on the exact details of medication use because this information is not available for most of the studies. Where studies did report medication use participants were mostly prescribed multiple medications, including at least one antipsychotic.

3.2. Low intensity CBTp characteristics

The mean number of low intensity CBTp contact hours was 9.50 (SD = 3.47), ranging from 6 to 15 and the mean number of sessions used to deliver low intensity CBTp was 9.00 (SD = 2.91), with a range from 6 to 15 sessions. Five of the studies delivered low intensity CBTp

individually, and five within a group. Where CBTp was delivered in a group, the mean number of group members was 5.75 (SD = 0.96); however this information was not available for one of the studies. All interventions were delivered by practitioners with a formal psychological therapy qualification.

The CBTp interventions varied in their content and focus. In particular, while some studies focused on single, specific mechanisms theorized to maintain psychosis-related distress, other studies employed a broader range of CBTp techniques to target a broader range of proposed mechanisms. Five studies targeted specific mechanisms: self-esteem/self-confidence (Freeman et al., 2014; Hall & Tarrier, 2003), worry (Freeman, Dunn, et al., 2015), sleep (Freeman, Waite, et al., 2015) and cognitive dissonance in relation to explanations for delusions (Levine et al., 1998). Five studies targeted a broader range of mechanisms (Li et al., 2015; Mortan et al., 2011; Penn et al., 2009; Pinkham et al., 2004; Wykes et al., 2005).

3.3. Control conditions

All ten studies included a control condition: two were non-randomized, and the remaining eight were randomized controlled trials (RCTs). Six of the control conditions were treatment as usual, two compared low intensity CBTp to supportive psychotherapy, one to a supportive psychotherapy group, and one compared low intensity CBTp to a full intensity form of group CBTp (20 contact hours).

3.4. Drop-out rates

The mean study dropout rate was 5.53% (SD = 5.32), ranging from 0% to 13.50%. Intervention dropout rates were typically not reported.

3.5. Follow-up data

Six studies reported follow-up data. The mean follow-up period across studies was 7.86 months (SD = 6.09), ranging from 3 months to 18 months.

3.6. Meta-analysis results

Effect sizes are interpreted in line with Cohen's criteria for Cohen's *d* effect sizes (i.e. 0.2 = small effect, 0.5 = medium effect and 0.8 = large effect). Fig. 2 shows that all of the post-intervention between-group effect sizes favor low intensity CBTp over the control conditions with small–medium to large effect sizes.

3.7. Primary outcome: effect of low intensity CBTp on psychosis symptoms

Nine studies included a measure of psychosis symptoms. We found a statistically significant between-group effect on psychosis symptoms at post-intervention in the medium range, with significant heterogeneity ($d = -0.46$, 95% CI: -0.86, -0.06; $Z = -2.24$, $p = .03$; $Q_T = 34.00$). When the outlier study, with the largest effect size is removed (Levine et al., 1998), the effect of low intensity CBTp on psychosis outcomes remains significant although smaller in size ($d = -0.28$, 95% CI: -0.54, -0.02; $Z = -2.08$, $p = .04$; $Q_T = 14.11$). Moreover, the psychosis symptom effects were maintained at follow-up with a small–medium effect size and significant heterogeneity ($N = 6$, $n = 494$, $d = -0.40$, 95% CI: -0.74, -0.06; $Z = -2.30$, $p = .02$; $Q_T = 13.79$).

We conducted moderation analyses to explore heterogeneity, specifically the effects of study quality, therapist contact (hours/number of sessions) and therapy format (individual of group) on psychosis outcomes were explored (see Table 2 and Table 3 in the Supplementary materials). None of these moderation analyses were significant: study quality ($r_s(8) = .39$, $p = .30$), number of sessions ($d = -0.23$, $\beta = .25$; $Z = 1.45$, $p = .15$), number of contact hours ($d = -0.23$, $\beta = .17$; $Z = 1.00$, $p = .32$), or therapy format (*between group* $Q = 0.01$,

Table 1

The studies included in the meta-analysis. *Note*: I = individual; G = group; N = no; Y = yes; TAU = treatment as usual. Age and gender are reported where available.

| First author	Participants	Intervention (I)/control (C)	Intervention format	Contact time (hours)	Delivered by therapist?	Measures	Follow-up period (months)	Quality rating (/31)	Assessments blinded?
Freeman et al. (2014)	All experiencing a persistent delusion and negative beliefs about the self. Age: $M = 41.70$ 66.67% male, 33.33% female	I: CBTp targeting negative beliefs about the self ($n = 15$) C: TAU ($n = 15$)	I	6	Y Clinical Psychologists	BDI II, BAI	3	26	Y
Freeman, Dunn et al. (2015)	All experiencing a persecutory delusion, as well as clinically significant worry Age: $M = 41.50$ 57.50% male, 42.50% female	I: CBTp aimed at reducing worry ($n = 73$) C: TAU ($n = 77$)	I	8	Y Clinical Psychologists	PANSS total	4	29	Y
Freeman, Waite et al. (2015)	Experiencing distressing hallucinations and delusions. Has sleep difficulties for at least a month Age: $M = 40.90$ 68% male, 32% female	I: CBTp aimed at improving sleep for people with hallucinations and delusions ($n = 24$) C: TAU ($n = 26$)	I	11	Y Clinical Psychologists	PANSS total	3	26	Y
Hall and Tarrier (2003)	Diagnosed with a psychotic disorder, all experiencing positive symptoms. Recruited from an inpatient acute psychiatric facility Age: $M = 38$ 48% male, 52% female	I: CBTp using realty testing for self-esteem and increasing conviction in positive beliefs ($n = 12$) C: TAU ($n = 13$)	I	7	Y CBT therapist	PANSS total, HADS depression, HADS anxiety, SFS	3	25	N
Levine, Barak, and Granek (1998)	Diagnosed with paranoid schizophrenia, without any religious convictions. Age: $M = 32.00$ All male	I: CBTp group using cognitive dissonance to consider alternative explanations for delusions ($n = 6$) C: 7 sessions of a supportive psychotherapy group focusing on coping ($n = 6$)	G	7	Y Therapists trained in cognitive dissonance induction	PANSS total	0	21	Y
Li et al. (2015)	Experiencing at least mild psychiatric symptoms. Recruited from psychiatric hospitals in China. Age: $M = 31.36$ 37.50% male, 62.50% female	I: CBTp focusing on both positive and negative symptoms, including relapse prevention work ($n = 96$) C: 15 sessions of supportive psychotherapy offering emotional support and coping strategies ($n = 96$)	I	15	Y Clinical Psychologists and trained psychiatrists	PANSS total, PSP	18	28	N
Mortan, Tekinsav Sütcü, and German (2011)	Hearing distressing voices with a diagnosed psychotic disorder. Recruited from an inpatient unit. Age: $M = 42.3$ All male	I: CBTp using cognitive restructuring, coping strategies and psychoeducation based on the diathesis-stress model ($n = 7$) C: TAU ($n = 5$)	G	15	Y Clinical Psychologists	SAPS, BDI, HAI	12	18	N
Penn et al. (2009)	Must have taken part in two previous pharmacological trials, with a diagnosed psychotic disorder. Recruited from both hospitals and community services. Age: $M = 40.65$ 53% male, 47% female	I: CBTp focus of self-monitoring and coping strategies, including gaining an awareness of triggers and understanding voices ($n = 32$) C: 12 sessions Supportive psychotherapy focussing on non-symptom based problems ($n = 33$)	G	12	Y Clinical Psychologist and other professionals	PANSS total, BDI II, SFS	12	28	Y
Pinkham, Gloege, Flanagan, and Penn (2004)	Experiencing medication-resistant distressing voices. Referred from an inpatient unit Age: $M = 39.60$ 62.5% male, 37.5% female	I: CBTp focusing on understanding voices, coping strategies and dealing with stigma ($n = 5$) C: 20 sessions GCBTp using ABC model and coping strategies ($n = 5$)	G	7	Y CBT therapist	PSYRATS total	0	20	N
Wykes et al. (2005)	Diagnosed with schizophrenia and experiencing distressing voices. Recruited through community teams Age: $M = 39.70$ 58.80% male, 41.2% female	I: CBTp focusing on understanding voices, improving self-esteem and developing coping strategies ($n = 45$) C: TAU ($n = 40$)	G	7	Y Clinical Psychologists	PSYRATS total, SBS	0	27	N
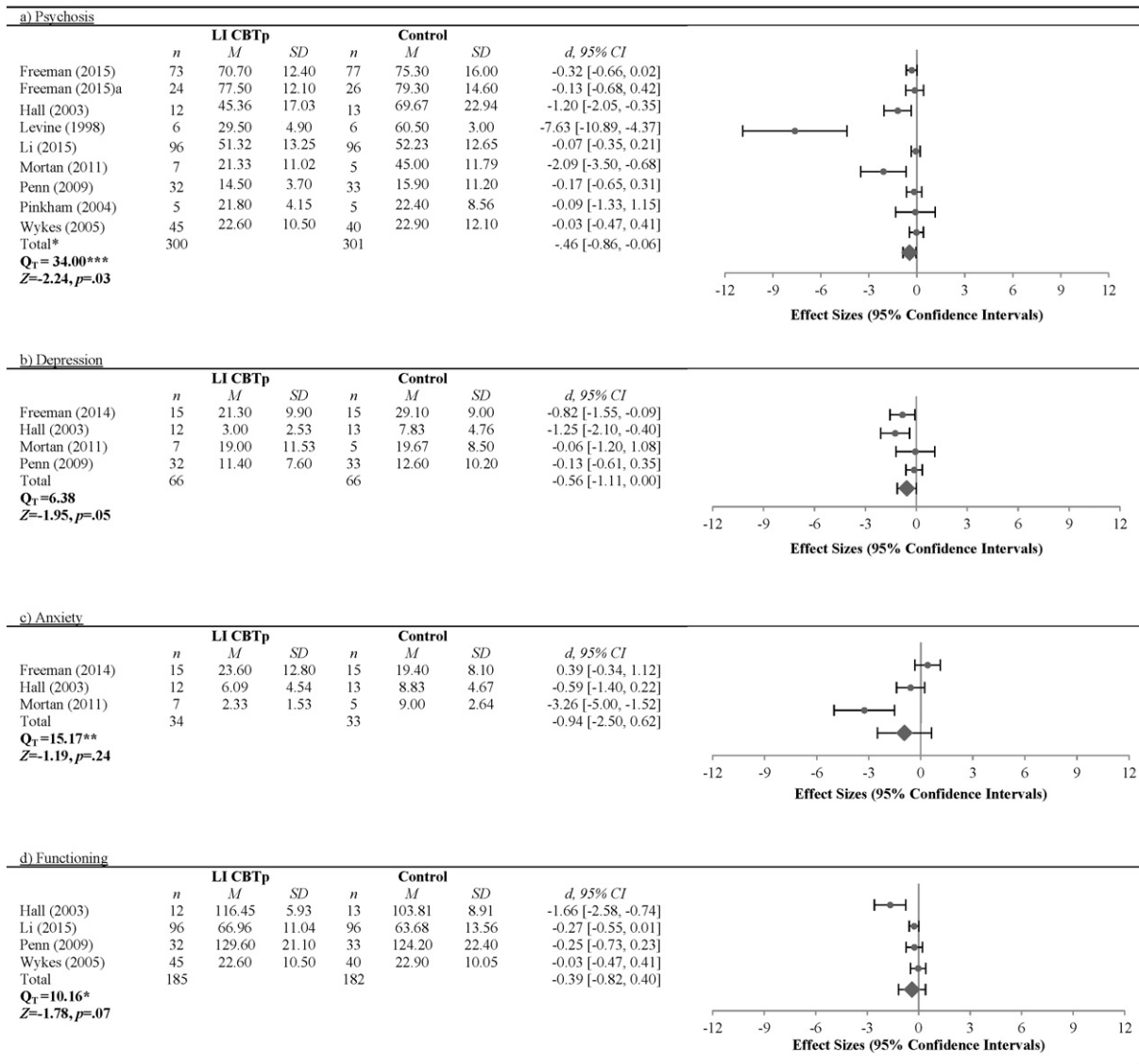
Fig. 2. Forest plot of effect sizes and 95% CI for post-intervention between-group effect sizes on psychosis, depression, anxiety and functioning outcomes. *Note*: ♦ = the overall effect size. A negative effect size favors low intensity CBTp over the control condition. + = effect sizes that were recoded so a negative effect size favors low intensity CBTp. Q_T = total homogeneity; z = z score; p = exact p value. *p < .05, **p < .01, ***p < .001.

$p = .93$; individual: $d = -0.23$, 95% CI: -0.42, -0.03; group: $d = -0.24$, 95% CI: -0.54, 0.06).

The quality ratings for these nine studies ranged from 18 to 29 (out a total possible of 31 using the Downs and Black index (1998)), with a mean quality rating of 24.67 (SD = 4.00). The common methodological pitfalls across these studies were that participants and care team staff were not blind to allocation, and few studies controlled for potential confounds. The higher quality studies (a quality score that was above the mean quality score) typically had blinded post-intervention assessments, whereas the lower quality studies tended not to. Although we found that study quality was not a moderator of psychosis outcomes, this analysis had low statistical power so the relationship between study quality and psychosis effect sizes was explored further.

As there is no recommended cut-off categorizing study quality for the Downs and Black index (1998), we split the studies dependent on whether assessors were blind at post-intervention or not (a key quality indicator of CBTp as used by Jauhar et al., 2014). With the data split in this way both analyses failed to show significant post-intervention

between-group effects on psychosis outcomes, possibly due to these subgroup analyses being underpowered. However, it is of note that the mean effect size of the four blinded studies ($d = -0.57$, 95% CI: -1.35, 0.20; $Z = -1.45$, $p = .15$; $Q_T = 20.11$) was not lower than that for unblinded studies ($d = -0.47$, 95% CI: -1.01, 0.07; $Z = -1.72$, $p = .09$; $Q_T = 13.50$). This concurs with the moderation analysis of study quality and suggests that study quality was not associated with smaller effect sizes for the low intensity CBTp studies.

3.8. Effects on secondary outcomes

We also explored the effects of low intensity CBTp on depression (4 studies), anxiety (3 studies) and functioning (4 studies) outcomes. Post-intervention between-group effects on all secondary outcomes were in the small/medium to large range but none were statistically significant (anxiety: $d = -0.94$, 95% CI: -2.50, 0.62; $Z = -1.19$, $p = .24$; $Q_T = 15.17$; functioning: $d = -0.39$, 95% CI: -0.82, 0.40; $Z = -1.78$, $p = .07$; $Q_T = 10.16$), although the effect on depression

outcomes only just failed to meet the criteria for statistical significance ($d = -0.56$, 95% CI: -1.11, 0.003; $Z = -1.95$, $p = .05$; $Q_T = 6.38$). However, at follow-up time points however, effects on depression and functioning outcome effects were significant (depression: $d = -0.56$, 95% CI: -0.97, -0.15; $Z = -2.65$, $p = .01$; $Q_T = 3.79$; functioning: $d = -0.57$, 95% CI: -0.81, -0.33; $Z = -4.68$, $p < .001$; $Q_T = 1.80$); but for anxiety effects remained non-significant ($d = 0.04$, 95% CI: -1.28, 1.36; $Z = 0.05$, $p = .96$; $Q_T = 12.20$). There were too few studies with measures of secondary outcomes to warrant moderation analysis.

3.9. Publication bias

Rosenthal's (1979) fail safe *N* for the between-group psychosis effect was 64.39. This means that more than 64 unpublished studies with null results would have to be included in this meta-analysis for the effect size to become non-significant at the $p < .05$ level. A funnel plot (see Fig. 3 in the Supplementary materials) of the between-group psychosis effect sizes against the related standard errors showed effect sizes generally to be evenly distributed around the overall mean effect size. The plot did suggest that a study with a very strong effect size in favor of control conditions may be missing, although this may be because of an outlier effect size on psychosis outcomes in the current meta-analysis ($d = -7.63$; Levine et al., 1998). As noted earlier, when this study is removed, effects on post-intervention between-group psychosis outcomes remain significant. There is therefore no clear indication of publication bias in the present meta-analysis.

4. Discussion

This meta-analysis explored the effects of low intensity CBTp (i.e. fewer than 16 therapy contact hours) on psychosis symptom outcomes for people diagnosed with a psychotic disorder, as well as the effects on secondary outcomes of depression, anxiety, and functioning. We found that low intensity CBTp led to significant post-intervention between-group differences in psychosis symptoms compared to control conditions with a medium effect size. Where follow-up was measured this effect was maintained, with the follow-up time period ranging from 3 months to 18 months. Proposed moderators of study quality, therapist contact (number hours/sessions), and therapy format (individual or group) did not significantly predict post-intervention between-group psychosis outcomes.

The post-intervention between-group effects on secondary outcomes of depression, anxiety and functioning were not significant. However, between-group effects on depression and functioning became significant at follow-up while remaining non-significant for anxiety.

4.1. Effects on psychosis

Post-intervention effects of low intensity CBTp on the primary outcome, symptoms of psychosis ($d = 0.46$), were consistent with those found in meta-analyses of CBTp more broadly (e.g. Wykes et al., 2008: positive symptoms $d = -0.37$, 95% CI: -0.23, -0.52; negative symptoms $d = -0.44$, 95% CI: -0.17, -0.70; Jauhar et al., 2014: overall psychosis symptoms: $d = -0.33$, 95% CI: -0.47, $-.19$). Moreover, effects on psychosis symptom outcomes remained at follow-up. Therefore, our findings show great promise for low intensity CBTp and suggest that effects of low intensity CBTp on psychotic symptoms may be comparable to CBTp more broadly, although this possibility would require testing with a direct comparison between low and high intensity CBTp.

In contrast to two of the major previous meta-analyses of CBTp (Jauhar et al., 2014; Wykes et al., 2008), we found no effect of study quality on psychosis outcomes and we found that the mean effect size of higher quality studies (i.e. with blinded assessments) was not smaller than that found for lower quality (i.e. non-blinded) studies ($d = 0.57$ versus $d = 0.47$ respectively) on post-intervention psychosis outcomes

(although the absence of a statistically significant difference may be due to lack of power). The lack of association with study quality may reflect the generally high study quality ratings for many of the studies in our analyses and signal a move in the field towards conducting higher quality studies. Overall therefore, the effect on psychosis outcomes, the maintenance of effects at follow-up coupled with the lack of association with study quality shows that benefits may be achieved with fewer than the recommended 16 sessions of CBTp.

These findings raise the possibility that the same scarce CBTp therapist resource could be used to widen access as, by definition, low intensity therapies require less clinician time to deliver. The studies in our meta-analysis delivered CBTp using an average of nine sessions, this means that almost two patients could be seen by the same therapist for every one patient offered the recommended 16 sessions of CBTp. Moreover, half of the interventions included were delivered in a group with a mean of 5.75 participants per group. Therapy format (individual or group) did not moderate post-intervention psychosis symptom outcomes and therefore low intensity group CBTp could help to widen access further. In a time when healthcare funding is limited, and is unlikely to improve in the near future (Karanikolos et al., 2013; Roberts, 2015), service providers and clinicians must weigh up the balance between maximizing therapy effectiveness and widening access to all who might benefit. With limited therapist resources available our findings suggest that low intensity CBTp could be an important way to widen access while maintaining treatment effectiveness.

While findings for low intensity CBTp show promise, there is potentially room to improve the effectiveness of CBTp more broadly as effect sizes from meta-analyses, including the current one, are in the small–medium range (see Jauhar et al., 2014; Wykes et al., 2008). CBTp has become an umbrella term that encompasses many different techniques targeting different theorized mechanisms: a Delphi study by Morrison and Barratt (2010) identified 77 components to CBTp that were described as 'important or essential'. This is exemplified in the current meta-analysis where the CBTp interventions varied in their content and focus: half the studies targeted single mechanisms of psychosis-related distress (Freeman, Dunn, et al., 2015; Freeman, Waite, et al., 2015; Freeman et al., 2014; Hall & Tarrier, 2003; Levine et al., 1998) while the other half targeted a broader range of mechanisms (Li et al., 2015; Mortan et al., 2011; Penn et al., 2009; Pinkham et al., 2004; Wykes et al., 2005). Therapy format also differs between studies with CBTp offered in both individual and group formats and the diagnostic focus is sometimes on psychosis in general (e.g. Hall & Tarrier, 2003) and sometimes on specific psychosis symptoms such as delusions (e.g. Freeman, Dunn, et al., 2015) or distressing voices (e.g. Mortan et al., 2011).

The relative benefits of these different ways of delivering CBTp have not been well explored. Does it maximize therapeutic benefits: To focus on single or multiple mechanisms? To target psychosis in general or to focus on specific psychosis symptoms? To offer CBTp in a group or individual format? These are important questions for future research. For low intensity CBTp in particular there may be value in targeting a single mechanism linked to a single symptom (e.g. Freeman, Dunn, et al., 2015) as therapy time is limited and a focused approach may be most effective. Indeed, there is evidence from a recent meta-analysis that this taking this approach in CBTp for delusions may be more effective than broader focused CBTp (Mehl, Werner, & Lincoln, 2015). We need further research to allow us to answer these questions more fully and to identify the most effective modes of delivery for CBTp more broadly and for low intensity CBTp in particular.

4.2. Effects on secondary outcomes

Psychosis symptoms were the primary outcome in our meta-analysis, as is the case in previous meta-analyses of CBTp more broadly (e.g. Jauhar et al., 2014; Wykes et al., 2008). However, CBTp also aims to reduce distress and disturbance associated with psychosis symptoms (Birchwood & Trower, 2006) and in our meta-analysis we did not find

significant between-group post-intervention effects for distress (as measured by depression and anxiety outcomes) or disturbance (as measured by functioning outcomes). Yet, at follow-up, between group differences on depression and functioning outcomes (although not anxiety) were statistically significant. This may be an important finding as there is indication in the CBTp literature that beneficial effects may be delayed and not always seen immediately post-intervention (e.g. Sensky et al., 2000). Indeed, this is consistent with the CBT approach where internalizing therapy techniques comes with practice and where a period of post-therapy consolidation is often recommended in order to gain maximum therapeutic benefit (Jones-Smith, 2016). Our findings are consistent with this suggestion and delayed effects of depression and functioning could indicate that, as patients practice and become more familiar with CBTp techniques, benefits beyond psychosis symptoms emerge.

4.3. Acceptability

The mean study dropout rate was low (5.53%, range = 0–13.5%) and smaller than the study dropout reported in the meta-analyses of CBTp more broadly (e.g. median = 14.5%, range = 0%–45%; Wykes et al., 2008). This is an indication of high study quality and that trials of low intensity CBTp are acceptable to participants, but there was limited information provided on intervention engagement and acceptability to both service users and providers. More research is needed to specifically examine facilitators and barriers to engagement in low intensity CBTp interventions.

4.4. Strengths and limitations

Strengths of the meta-analysis include a rigorous search strategy and application of eligibility criteria to strike a balance between study rigor (i.e. all were controlled trials with participants meeting diagnostic criteria for a psychotic disorder) and a sufficient number of studies to allow for meaningful conclusions to be drawn. Study quality was rated and independently verified in order to explore the possibility that study quality moderated findings. Finally, a range of possible moderators of psychosis symptom outcome were tested including therapist contact time and therapy format. However, a limitation of the meta-analysis was that only a small range of possible moderators were examined due to the small study sample size. Future research would benefit from examining the effects of other moderators of outcomes such as severity of symptoms at baseline or level of therapist training. In relation to this question of therapist training, the Improving Access to Psychological Therapies (IAPT) initiative in the UK (Department of Health, 2012) aims to increase access to evidence-based psychological therapies for common mental health problems (i.e. depression and anxiety). This has been achieved, in part, through training psychological wellbeing practitioners (PWPs) to offer low intensity CBT within a stepped-care approach (i.e. low intensity CBT is offered first, followed by full intensity CBT with a CBT therapist where necessary). These PWPs typically do not have a prior professional training in mental health care, but receive specialist, typically in-service training. Evaluation of IAPT shows that this approach helps to widen access while achieving good clinical outcomes (Department of Health, 2012). Whether the PWP curriculum can be adapted to effectively offer low intensity CBTp is currently being evaluated (Jolley et al., 2015) and, dependant on outcomes, this approach offers further potential to widen access to CBTp without increasing resources.

A further limitation of the meta-analysis is that findings from the controlled clinical trials may not generalize to routine clinical practice both because of the efforts made in trials to retain participants that would not be realistic to employ in clinical settings and because participants taking part in trials may not be representative of the wider population. A future research question therefore is whether findings from the current meta-analysis generalize to routine clinical practice.

Strengths of the included studies were that most were of reasonably high quality, although not all studies had blind post-intervention assessments, and studies generally provided a clear description of participant demographic and diagnostic details and about the nature of the CBTp intervention that was administered. In terms of the primary outcome the studies used assessor-administered measures of psychosis symptoms which are seen as preferable to relying on self-report measurement tools. However, there were a number of limitations with the included studies which are outlined below.

First, most (6/10) of the studies had a treatment-as-usual control condition and these studies therefore do not allow for specific effects of CBTp to be separated from non-specific effects such as therapist attention and expectation of benefit. Future studies would benefit from including active control conditions in order to allow for specific CBTp effects to be elucidated.

Second, it could be argued that the participants involved in trials of low intensity CBTp are not comparable to those included in trials of CBTp more generally; for example, those that are offered trials of low intensity CBTp may be experiencing less complex and severe forms of psychosis. To address this potential limitation, we used the same exclusion criteria as two major meta-analyses of CBTp (; Jauhar et al., 2014; Wykes et al., 2008) and only included trials where participants met diagnostic criteria for a psychosis disorder. Moreover, there is no indication in inclusion/exclusion criteria for individual studies that people with more complex/severe form of psychosis were excluded. However, this is an interesting question for future research where initial symptom severity could be tested as a moderator of effects of low intensity CBTp.

Third, while study drop-out was well reported, details of intervention engagement were generally missing. Providing information on the number of low intensity CBTp sessions attended and amount of homework completed is crucial for fully understanding the effectiveness of the intervention. Per protocol analysis would allow for the effectiveness of low intensity CBTp for intervention completers to be examined separately to intention-to-treat effectiveness. That is, it is possible that intervention completers show greater benefits than non-completers and, in this case, a focus on methods to increase intervention completion would be warranted. In future, studies of low intensity CBTp would benefit from measuring and reporting on indicators of intervention engagement.

4.5. Research implications

Our findings raise a number of questions for future research, in particular as regards mechanisms of change and moderators of outcome for low intensity CBTp. First, we suggest that low intensity CBTp interventions might be most beneficial when targeting specific symptoms of psychosis and linked mechanisms, particularly as a limited number of sessions are available. There are already trials taking this approach (e.g. Freeman, Dunn, et al., 2015) and showing that changes on the proposed mechanism (in this case worry) mediate effects on the targeted outcome (in this case paranoia). Future studies of low intensity CBTp could take forward this causal-interventionist approach and help to elucidate the most important mechanisms of change in low intensity CBTp. Second, we suggest a focus on moderators of outcome in order to more fully understand who benefits from low intensity CBTp, and who might not. Moderators to test include baseline severity/complexity of psychosis symptoms, the nature of psychosis symptoms (e.g. paranoia, hearing voices, negative symptoms) and the presence of co-morbid symptoms of depression or anxiety disorders. Such research would help to elucidate how best to allocate scarce CBTp therapist resource most effectively and efficiently. Therapist training (i.e. whether therapists have a specialized CBTp training or not) should also be examined as a moderator of low intensity CBTp outcomes; if non-specialists can achieve similar outcomes to specialist practitioners this could further widen access by increasing the pool of practitioners able to offer the therapy.

4.6. Clinical implications

Our meta-analysis found that low intensity CBTp can have beneficial effects on symptoms of psychosis both at post-intervention and follow-up. Given this, low intensity CBTp could be offered in mental health services, perhaps as part of a stepped-care model. Within a stepped-care model people with psychosis would be offered low intensity CBTp in the first instance, and then, if difficulties remain, people would be 'stepped up' to high-intensity CBTp (Bower & Gilbody, 2005). This approach to service delivery could increase access to CBTp, without denying those who need it access to higher intensity therapy. Alternatively, a matched care approach may be deemed appropriate, where the intensity of CBTp (low or high) would be matched to people's presenting needs (Martinez & Williams, 2010). The suggested research highlighted above will help to elucidate moderators of low intensity CBTp outcomes and will help to match people to the most appropriate form of the therapy.

4.7. Conclusion

This meta-analysis shows that low intensity CBTp relative to control conditions leads to fewer symptoms of psychosis at both post-intervention and follow-up with effect sizes broadly in line with the wider CBTp literature. Post-intervention effects on psychosis were irrespective of intervention format (group or individual) or therapy duration (number of contact hours and sessions). Findings support offering low intensity CBTp in mental health services and thereby widening access to scarce CBTp therapist resource. We suggest future research on low intensity CBTp could focus on evaluating mechanism-specific interventions for specific symptoms of psychosis as well as on exploring moderators of low intensity CBTp outcomes. Fulfillment of these recommendations will enable us to see if the promise of low intensity CBTp can be achieved.

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Contributors

All authors were involved in the design of the study. Cassie Hazell conducted the literature search and screening of papers, extracted the data and carried out the analysis. All other authors supervised this process. The manuscript was written by Cassie Hazell and Clara Strauss with comments provided by Kate Cavanagh and Mark Hayward. All authors contributed to and approved the final manuscript.

Conflict of interest

All authors declare that they have no conflicts of interest.

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Appendix A. Appendix

$$d = \frac{M_t - M_c}{S_{pooled}} \tag{1}$$

$$S_{pooled} = \sqrt{\frac{s_1^2(n_1 - 1) + s_2^2(n_2 - 1)}{n_1 + n_2 - 2}} \tag{2}$$

$$w = \frac{1}{v} \tag{3}$$

where:

$$v = \frac{n_1 + n_2}{n_1 n_2} + \frac{d^2}{2(n_1 + n_2)}$$

Appendix B. Supplementary data

Supplementary data to this article can be found online at http://dx.doi.org/10.1016/j.cpr.2016.03.004.

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