

Are Group Psychotherapeutic Treatments Effective for Patients with Schizophrenia? A Systematic Review and Meta-Analysis

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Key Words

Schizophrenia · Group psychotherapy · Systematic review · Meta-analysis

Abstract

Background: Different psychotherapeutic treatments for schizophrenia are delivered in groups. However, little is known about the effectiveness of these group therapies for people with schizophrenia across different treatments with varying therapeutic orientations. This review aimed to (1) estimate the effect of different group psychotherapeutic treatments for schizophrenia and (2) explore whether any overall 'group effect' is moderated by treatment intensity, diagnostic homogeneity and therapeutic orientation. **Methods:** A systematic search of randomised controlled trials exploring the effectiveness of group psychotherapeutic treatments for people with schizophrenia was conducted. Random-effect meta-analyses on endpoint symptom scores compared group psychotherapeutic treatments with treatment as usual and active sham groups. Findings on social functioning were described narratively, and meta-regression analyses on group characteristics were carried out. **Results:** Thirty-four eligible trials were included. A weak-to-moderate significant between-group difference in favour of group psychotherapeutic treatments was found for negative symptom scores

(standard mean difference = -0.37 , 95% confidence interval $-0.60, -0.14$; $p < 0.01$, $I^2 = 59.8\%$) only when compared to treatment as usual and not to active sham groups. Improved social functioning was reported as a treatment outcome in the majority of studies compared to treatment as usual. The 'group effect' on negative symptoms was positively related to 'treatment intensity' ($\beta = 0.32$, standard error = 0.121 ; $p < 0.05$). **Conclusion:** Group psychotherapeutic treatments can improve negative symptoms and social functioning deficits in the treatment of schizophrenia. The effect occurs across different treatments and appears to be non-specific. Future research should identify the underlying mechanisms for the positive effect of participating in groups and explore how they can be maximised to increase the therapeutic benefit.

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Introduction

In accordance with guidelines from the National Institute for Health and Care Excellence in the United Kingdom [1] and the Schizophrenia Patient Outcomes Research Team in the United States [2], psychotherapeutic treatments are widely regarded as a necessary intervention for schizophrenia. In particular, there has been a growing interest in the development and delivery of psy-

chotherapeutic treatments in a group format for this population [3].

From an economic perspective, a group setting is seen as a useful approach, as it allows for one therapist to treat several people at the same time [4]. From a clinical perspective, group psychotherapeutic treatments are also believed to offer social advantages relevant to this population [4–8], who often have smaller social networks and less satisfactory interpersonal relationships compared to a healthy population [9]. Seminal work on group therapeutic processes [10] (including group cohesion, instillation of hope, interpersonal learning and sharing of information) supports the notion that the group setting can be utilised as an agent of change in group psychotherapeutic treatments.

Evidence from randomised controlled trials on group cognitive behavioural therapy (CBT) [6], group social skills training [11], group music therapy [12] and group psycho-education [13] suggests that group psychotherapeutic treatments, with different therapeutic orientations, can be effective in improving a number of clinical outcomes for people with schizophrenia. In their review of controlled studies for schizophrenia conducted between 1986 and 2006, Segredou et al. [8] found that, descriptively, all of the 23 studies they identified showed a positive effect on either symptom or skills outcomes.

In the treatment of positive symptoms, including hallucinations and delusions, a group format has been suggested to provide an opportunity for participants to share experiences and reflect on similarities, which, in turn, can aid the restructuring of false beliefs [7, 14, 15]. In the treatment of negative symptoms, such as lack of speech, social withdrawal, blunted affect and social functioning deficits, it has been argued that group members serve as models and reinforcers for each other, which, in turn, can help the development of relationships [11, 16]. An improved understanding of how to treat negative symptoms is of particular importance, given that these symptoms are more resistant to medication than positive symptoms [17] and highly related to poor social functioning [18] and a poor quality of life [19].

Despite the potential cost benefits and clinical advantages of a group setting, little methodologically robust research has explored whether group psychotherapeutic treatments have a benefit for people with schizophrenia [20–22] and whether they are effective across specific therapeutic orientations [23]. At present, too few studies are available to test the effectiveness of group treatments as compared to individual treatments for each psychotherapeutic treatment of schizophrenia [22]. Further-

more, whilst attempts have been made to summarise findings from controlled trials exploring the effectiveness of group psychotherapeutic treatments for schizophrenia [8, 22, 24, 25], the conclusions from these studies are limited in scope. For example, the most recent attempt by Segredou et al. [8] does not include evidence from non-verbal creative group arts therapies (including music therapy, body psychotherapy and art therapy), which have been shown to be effective in reducing negative symptoms [1]. Furthermore, their findings are limited to a descriptive analysis of the literature.

To date, no attempt has been made to statistically pool the existing evidence using meta-analytical techniques. Consequently, it is unclear whether group psychotherapeutic treatments have an effect across different treatment models for schizophrenia with varying therapeutic orientations. Therefore, this review aimed to establish whether there is an overall ‘group effect’ across a range of group psychotherapeutic treatments as compared to treatment as usual (TAU) [26]. If people with schizophrenia benefit from a non-specific ‘group experience’, one would expect to see clinical improvements in participants across a range of group psychotherapeutic treatments. If this effect was in fact due to processes in the ‘group’, it might not be apparent when compared to an active sham group [1]. In the literature, active sham groups are defined as a group condition aimed at controlling for *non-specific* effects of the ‘group’ (for example, therapist attention, therapeutic rationale and therapeutic alliance) and strictly does not involve any of the unique psychotherapeutic techniques under investigation [27, 28]. Therefore, we also assessed whether there is an effect of group psychotherapeutic approaches compared to active sham groups. Finally, we aimed to explore which group characteristics contribute to any potential group effect. In particular, we considered the therapeutic orientation, number of sessions/length of intervention [22] and/or diagnostic homogeneity [7] as potentially important factors for the impact of group psychotherapeutic treatments [8, 24].

Methods

Search Strategy

A protocol was developed using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Statement (PRISMA) [29]. The electronic databases searched included PsychINFO (1806 to March 2014), Medline (1946 to March 2014), Embase (1974 to March 2014) and AMED (1985 to March 2014). MeSH and text word search terms relating to ‘group psychotherapeutic therapies’ AND ‘randomised controlled trials’ AND ‘schizophre-

nia' (online suppl. table 1 for Medline search terms; see www.karger.com/doi/10.1159/000377705) were used for each database. Search terms were modified for each database. Where outcome data were not fully reported, first and second authors were contacted via e-mail requesting any missing information. Hand searching of the following key journals was conducted: *Group Therapy*, *Behavioural Group Therapy*, *The Clinical Psychologist*, *Group Analysis*, and the *Journal of Contemporary Psychotherapy*. A grey literature search of the Cochrane database and websites including the Health Technology Assessment, the National Institute of Mental Health, the Wellcome Trust and the Medical Research Council was also conducted. Additionally, studies cited in relevant reviews on psychotherapeutic treatments for schizophrenia were hand searched.

Eligibility Criteria

Studies at the title and abstract phase were screened for the following inclusion criteria: (1) randomised controlled trial; (2) psychotherapeutic treatments provided in treatment condition, and (3) included participants with a diagnosis of schizophrenia and related disorders. Studies were excluded if they: (1) involved individualised treatment; (2) involved family therapy and/or family intervention, and (3) included participants aged ≤ 16 years. Studies that were only abstract publications and/or protocols were not included.

At the full paper review stage, studies were further excluded according to the following criteria: (1) a sample with $<85\%$ of participants diagnosed with schizophrenia, schizotypal, schizoaffective and/or other non-affective psychotic disorders outlined in the Diagnostic Statistical Manual and International Classification of Diseases; (2) did not measure either symptoms of schizophrenia (either positive, negative, general or total symptoms) or social functioning; (3) did not make a clear reference to a group format in the treatment condition; (4) was not published in a language using Latin-based characters; (5) the control condition was delivered as a group psychotherapeutic treatment rather than an active sham group (i.e. active discussion group, support group, counselling group, occupational therapy group or problem-solving discussion group) or TAU, where 'waitlist control group' (no treatment offered until the intervention condition has received their treatment) and 'standard psychiatric care' are considered as TAU.

Study Selection and Data Extraction

The first author (S.O.) conducted the initial screening of all the titles and abstracts and all the studies at the full paper review phase. The second author (C.B.) re-extracted 50% of the studies at full paper review and 20% of abstracts, randomly selected using a random number generator. Any ambiguity was resolved with the third author (S.P.). All included studies were independently extracted by two reviewers (S.O. and C.B.) using a structured format (online suppl. table 2). The Cochrane risk of bias tool was used to assess the studies [30]. It was agreed by all authors to exclude the 'blinding of personnel' category, given that in trials examining the effectiveness of group psychotherapeutic treatments, it is not possible to keep participants blind to their treatment allocation. 'High'-risk studies were identified as those that scored a 'high risk' for at least 4 of the 6 categories prior to data extraction.

Outcomes

The primary outcome was the mean symptom scores (including positive, negative, general and/or total symptom scores) at the

end of treatment, measured as a continuous variable. As measured by the Positive and Negative Symptom Scale (PANSS) [31], positive symptoms include delusions, grandiosity, suspiciousness, hostility and hallucinations; negative symptoms include emotional withdrawal, poor rapport, difficulty in abstract thinking, blunt affect and social withdrawal; general symptoms include anxiety, depression, insight and guilt, while total symptom scores are the sum of positive, negative and general symptoms. The original authors' definitions of symptoms were followed, rather than a predefined operationalised definition. Social functioning scores were measured as a secondary outcome and examined descriptively.

Data Analysis

For each study, means and standard deviations were extracted. Standard mean differences with 95% confidence intervals were calculated from the data extracted. Data were pooled using a random-effects meta-analysis in STATA version 12. Endpoint scores from both the treatment and control conditions were used to assess the impact of group psychotherapeutic treatments on symptoms of schizophrenia. Data were pooled in such a way that a standard mean difference <0 favoured the treatment condition. Heterogeneity was assessed visually and by the I^2 statistic [32].

The first set of meta-analyses explored group psychotherapeutic treatments compared to TAU for positive, negative, general and total symptom scores. The second set of meta-analyses explored group psychotherapeutic treatments compared to active sham groups for positive, negative, general and total symptom scores. Planned sensitivity analyses were conducted to explore the robustness of the results. In these analyses, studies with a high risk of bias and studies where baseline mean symptom scores varied across the treatment and control condition were excluded.

Post hoc meta-regression analyses were used to explore which factors were driving significant group effects found across the main meta-analyses and planned sensitivity analyses. Meta-regression analyses were therefore only conducted on studies that compared a group psychotherapeutic treatment to TAU and not active sham groups. The first two meta-regression analyses explored the effect of therapeutic orientation by dichotomising psychotherapeutic treatments as (1) non-verbal arts therapies (including music therapy, body-oriented psychotherapy and art therapy) versus non-arts therapies and (2) cognitive-behavioural approaches (including cognitive-behavioural social skills training and compensatory cognitive training) versus other therapeutic approaches. The second meta-regression analysis explored the effect of treatment 'intensity', calculated as a continuous variable from the duration of a session (in hours) multiplied by the number of sessions offered in the treatment. A log transformation was conducted on this variable to ensure that it was normally distributed. The third meta-regression analysis explored the effect of 'diagnosis' as a dichotomised variable, comparing studies that included 'schizophrenia' and 'schizophrenia and related disorders'.

Due to the varied range of assessments used to measure social functioning, it was decided a priori to not conduct a meta-analysis on this outcome. As outlined by Higgins et al. [30], a meta-analysis should only be conducted if outcomes share similar clinical characteristics. Instead, outcomes on social functioning deficits were discussed descriptively in a narrative synthesis, which included a description of statistical outcomes and author conclusions.

Results

Search Results

A total of 5,078 studies were identified in the electronic database search. Following the exclusion of duplications ($n = 1,962$) and the removal of studies at the title screening phase ($n = 1,564$), 1,552 abstract articles were reviewed (online suppl. fig. 1). Of the 324 studies identified for full paper review, 34 studies were included. Seven studies [33–39] used data from 3 data sets, 1 study [40] included data from 2 separate trials, and 1 study [41] had 2 control arms. Hence, in total, 32 data sets were included in the final meta-analysis.

Study Characteristics

The study characteristics of the studies from which the 32 data sets were included are summarised in online supplementary table 3. In total, 13 data sets compared a group psychotherapeutic treatment to an active sham group [37, 39, 41–51], and 19 data sets compared a group psychotherapeutic treatment to TAU [7, 12, 13, 34, 40, 41, 52–63]. Thirty-one percent of the interventions were cognitive-behavioural approaches (including cognitive-behavioural social skills training and compensatory cognitive training), 19% came under the umbrella term ‘non-verbal arts therapies’ (including music therapy, body-oriented psychotherapy and art therapy), and the remaining 50% included a range of therapeutic orientations such as cognitive remediation therapy, psycho-education and integrated approaches. These approaches were varied in terms of their therapeutic focus and therapeutic outcome (online suppl. table 4), including positive symptoms (13%), social functioning (22%), cognitive functioning (22%) and negative symptoms (9%), a range of outcomes (22%) or outcomes that did not fit into any of these categories (22%). The most common measure of symptoms was the PANSS (81, 63, 92.9 and 68.4% for positive, negative, general and total symptom scores, respectively; online suppl. table 5). Twenty-two studies (71%) were conducted in an outpatient setting, 12 studies (38%) stated the use of an intention-to-treat design, and 9 studies (28%) included a sample size calculation. The average follow-up rate was 8% for studies that compared a group psychotherapeutic treatment to an active sham group and 7% for studies that compared group psychotherapeutic treatment to TAU. On average, 38 and 34% of the treatment and control groups were female, respectively. The age of the participants ranged from 17 to 78 years, and the mean age reported was 39 years; 4 studies did not have any information on age range, and 4 studies did not state

an upper limit. In total, 2,634 patients were represented in the 32 data sets included in this review, of whom 1,334 participants were represented in the treatment condition and 1,300 were represented in the control condition.

Risk of Bias

In total, 3 studies scored ‘high risk of bias’ for at least 4 of the 6 categories, and, therefore, were rated as low quality (online suppl. fig. 2). With the exception of the funnel plot on positive symptoms, all plots are slightly asymmetric, with an absence of data on the lower right hand side of the plot (online suppl. fig. 3). Egger tests of publication bias found no statistical evidence of publication bias for negative, positive or general symptom scores. However, there was statistical evidence of publication bias for the studies included in the meta-analyses comparing group therapeutic treatments with TAU and active sham groups for total symptoms ($\beta = 0.975$, $p = 0.01$) and for studies included in the total symptoms planned sensitivity analyses ($\beta = 0.999$, $p = 0.02$).

Impact of Group Psychotherapeutic Treatments on Symptoms

Table 1 summarises findings from the meta-analyses comparing group psychotherapeutic treatments with TAU and active sham groups and from sensitivity analyses (which excluded studies with a high risk of bias and studies where baseline mean symptom scores varied across the treatment and control condition; online suppl. table 6) of endpoint outcomes for positive, negative and general symptoms. Separate analyses were conducted for studies that compared a group psychotherapeutic treatment to TAU and those that compared a group psychotherapeutic treatment to an active sham group.

In the meta-analyses comparing group psychotherapeutic treatments to TAU, there was a significant between-group difference for endpoint negative symptom scores, endpoint general symptom scores and endpoint total symptom scores in favour of the treatment condition. No main effect was found for positive symptom scores. Findings were robust across planned sensitivity analyses for both negative and positive symptoms. However, the effects on general and total symptoms were no longer significant in the planned sensitivity analyses, following the removal of studies rated as high risk of bias. Forest plots for group psychotherapeutic treatments compared to TAU and active sham groups are shown in online supplementary figure 4a and b.

There was no evidence of a significant between-group difference for endpoint negative symptoms, positive

Table 1. Summary of meta-analyses for positive, negative, general and total symptom scores, comparing group psychotherapeutic treatments to TAU and active sham groups

Outcome	Analysis	Studies	Participants	SMD	p value	I ² , %
Negative symptoms	Treatment vs. TAU	15	893	-0.37 (-0.60, -0.14)	0.002	59.8
	Treatment vs. sham	12	783	-0.09 (-0.36, 0.19)	0.542	68.5
	Sensitivity (treatment vs. TAU)	12	762	-0.40 (-0.67, -0.13)	0.004	66.6
	Sensitivity (treatment vs. sham)	10	687	-0.09 (-0.33, 0.16)	0.504	56.3
Positive symptoms	Treatment vs. TAU	11	730	-0.06 (-0.25, 0.13)	0.553	29.8
	Treatment vs. sham	9	654	0.07 (-0.32, 0.18)	0.590	49.7
	Sensitivity (treatment vs. TAU)	8	654	-0.02 (-0.21, 0.18)	0.877	27.5
	Sensitivity (treatment vs. sham)	9	654	0.07 (-0.32, 0.18)	0.590	49.7
General symptoms	Treatment vs. TAU	9	625	-0.22 (-0.43, -0.02)	0.035	27.8
	Treatment vs. sham	6	521	0.17 (-0.76, 0.42)	0.575	87.9
	Sensitivity (treatment vs. TAU)	7	593	-0.13 (-0.29, -0.03)	0.120	0
	Sensitivity (treatment vs. sham)	4	425	-0.16 (-0.46, 0.14)	0.303	49.8
Total symptoms	Treatment vs. TAU	9	651	-0.41 (-0.69, -0.13)	0.004	60.3
	Treatment vs. sham	10	812	0.12 (-0.74, 0.35)	0.479	91.8
	Sensitivity (treatment vs. TAU)	5	514	-0.33 (-0.66, 0.01)	0.052	66.3
	Sensitivity (treatment vs. sham)	8	538	-0.48 (-1.10, 0.11)	0.108	88.5

Figures in parentheses are 95% confidence intervals. Treatment vs. TAU = Meta-analysis comparing group psychotherapeutic treatments with TAU, waitlist control or standard psychiatric care; treatment vs. sham = meta-analysis comparing group psychotherapeutic treatments with active sham groups; sensitivity = sensitivity analysis; SMD = standardised mean difference; I² = heterogeneity.

symptoms, general symptoms or total symptoms for studies that compared a group psychotherapeutic treatment and an active sham group.

Meta-Regression Analyses

Meta-regression analyses were limited to outcomes on negative symptoms, given that no effect of group psychotherapeutic treatments was found on positive symptoms and that findings on the impact of general and total symptoms were inconsistent across the planned sensitivity analyses. The effect of group psychotherapeutic treatments on negative symptoms was not moderated by the therapeutic orientation or diagnostic homogeneity (table 2). However, the effect size on negative symptoms was positively moderated by the treatment intensity of the group psychotherapeutic treatments ($\beta = 0.32$, $SE = 0.121$, $p < 0.05$). The adjusted R² value indicated that 31% of the variance in this model was accounted for by the intensity of sessions, measured as number of sessions available in the group psychotherapeutic treatments.

Impact of Group Psychotherapeutic Treatments on Social Functioning

In total, 11 of the 19 studies which compared a group psychotherapeutic treatment to TAU reported outcomes

on social functioning (see online suppl. table 7). Six of the 11 studies [7, 12, 34, 52, 58, 63] found a statistically significant improvement favouring the group psychotherapeutic treatments over the control condition, and 5 studies did not [41, 53, 57, 59, 61]. Nine different measures of social functioning were reported in the 11 studies.

Discussion

This review found that group psychotherapeutic treatments were more effective in reducing negative symptoms than TAU across a diverse range of psychotherapeutic orientations. This effect was apparent only when these group psychotherapeutic treatments were compared to TAU, not to active sham groups. There was no evidence that group psychotherapeutic treatments improved positive symptoms across a range of group psychotherapeutic treatments compared to TAU or active sham groups. Furthermore, any evidence that general symptoms and total symptoms improved in favour of the group psychotherapeutic treatment condition compared to TAU was no longer significant when eliminating studies rated as high risk of bias. The narrative summary of studies indicated that overall, participants in group psy-

Table 2. Summary of meta-regression analysis on endpoint negative symptom standardised mean difference scores comparing group psychotherapeutic treatments and TAU

Characteristics	Coefficient	SE	I ² , %	Adjusted R ² , %	p value
Therapeutic orientation: arts and others	0.220	0.201	61.39	-1.41	0.282
Therapeutic orientation: cognitive-behavioural and others	-0.004	0.185	63.46	-6.20	0.985
Intensity (log transformed)	0.320	0.121	55.10	31.02	0.014
Diagnostic homogeneity	-0.001	0.176	61.65	-6.94	0.994

SE = Standard error; adjusted R² = variance; I² = heterogeneity.

chotherapeutic treatments benefited more in terms of reduced social functioning deficits in the treatment condition compared to TAU. No evidence was found for an effect of therapeutic orientation or diagnostic homogeneity. However, there was a significant positive relationship between treatment intensity and reduced negative symptoms.

This study has a number of strengths. To our knowledge, this is the first systematic review to explore the effectiveness of psychotherapeutic treatments delivered in groups using meta-analytic techniques. We used rigorous methods and a wide array of search terms encompassing a broad range of verbal and non-verbal psychotherapeutic group treatments. Stringent measures controlled for study quality. For example, all studies were independently extracted and assessed for risk of bias. Low-quality studies were excluded in planned sensitivity analyses rather than being rated on a quality scale and controlled for statistically [64].

There are also a number of potential limitations. The majority of the samples represented were outpatients (71%) and male (64%), which may limit the generalisability of the findings. However, as noted by Jane-Wit et al. [65], an important factor contributing to different results between randomised controlled trials is the difference in patient characteristics. Hence, the clinical validity of the findings is strengthened by the homogeneous population across the studies.

There is also the possibility of publication bias. Visual examination of funnel plots (online suppl. fig. 3) for negative, general and total symptoms indicate that there are slightly fewer trials with small samples favouring the control condition represented in this review. This may have biased the results of the review against the control condition. To account for this, statistical tests of publication bias were conducted. No statistical evidence of publica-

tion bias was found for positive, negative or general scores. However, there was statistical evidence of bias for total symptom scores.

Furthermore, I² scores from meta-analyses on negative symptoms indicate a moderate to high level of heterogeneity, i.e. I² scores between 50 and 75% [32]. However, visual examination of the forest plots (online suppl. fig. 4a and b) indicated a consistent overlap between the confidence intervals of the effect sizes in the majority of the studies, hence a minimal heterogeneity between studies. It is therefore likely that the high heterogeneity is being driven by a minority of outliers – Vreeland et al. [62] and Levine et al. [46] in the TAU and active sham group analyses, respectively – rather than by the significant variation between studies.

This review is also limited to symptom and social functioning outcomes. Given that group psychotherapeutic treatments have been implicated with a variety of improved outcomes [8, 22, 66], conclusions on their effectiveness are therefore incomplete. To address this limitation, separate analyses were conducted on major symptom domains.

Most studies were not reported as intention-to-treat analyses. Since a dropout is unlikely to be due to random factors and since only few studies reported reasons for a dropout, this may introduce completer-only bias. Given that too few studies carried out an intention-to-treat analysis, a further sensitivity analysis on this sub-group of studies was not deemed suitable. However, encouragingly, the follow-up assessment rate at the end of treatment was high across both treatment versus active sham groups and treatment versus TAU comparisons.

Finally, group psychotherapeutic treatments have not been assessed against individual psychotherapeutic treatments. Without controlling for the specific factors potentially relevant to the psychotherapeutic treatment itself, it

is difficult to make firm conclusions about the benefits of non-specific group effects. Whilst Wykes et al. [67] found no difference in the two treatment modalities, the validity of this comparison is limited by the fact that only 7 group CBT studies were compared to 26 studies on individual CBT.

Overall, evidence from this review supports the view that group mechanisms underpinning different group psychotherapeutic treatments can be clinically advantageous for people with schizophrenia [8, 26, 66] in the treatment of negative symptoms [16] and social functioning deficits [11]. As argued by Kanas [66], 'the group experience itself' (p. 10) appears to be clinically useful for this population who are often isolated and relate poorly with others. Given the effectiveness of group psychotherapeutic treatments across different therapeutic orientations as compared to TAU and the absence of a significant effect as compared to active sham groups, the findings are consistent with the hypothesis that beneficial group mechanisms are non-specific [20, 26]. In support of the 'contextual' model of psychotherapy of Wampold [23], these findings support the view that the benefit of group therapeutic mechanisms is due to common factors.

The group effect is shared across different approaches and, potentially, also with sham groups, which inevitably have some group processes in common with psychotherapeutic groups. The fact that a group condition is meant to be a sham condition in a trial can be obvious to researchers, but is often not evident to participants taking part in the trial. However, with respect to sham conditions, we cannot establish whether they are also effective in improving negative symptoms. Whilst we did not find a difference with psychotherapeutic groups, the data do not allow us to test for non-inferiority, and a direct comparison of sham groups with TAU was not possible.

Whilst the effect size was only small to moderate for negative symptoms, it is bigger than the standardised mean difference scores for negative symptoms reported in meta-analyses of CBT for schizophrenia [64]. Furthermore, the effect size is comparable with those in studies of social skills training for schizophrenia [68], cognitive remediation therapy for overall symptoms of schizophrenia [69] and scores from meta-analyses of first- and second-generation anti-psychotics [70].

In contrast to the review of Segredou et al. [8] on group psychotherapeutic treatments for schizophrenia, there was no evidence of improved positive symptoms. The inclusion of non-verbal therapies and more precise statistical techniques may account for this difference. Further-

more, results from this review are not consistent with the notion that group processes can be effective in aiding the restructuring of false beliefs around delusions or hallucinations [15, 71] in the treatment of positive symptoms [20, 23, 26]. As suggested by Wykes et al. [7], it might be difficult for therapists to flexibly respond to a wide variety of individual therapeutic needs when addressing positive symptoms in groups. Hence, a 'group effect' for positive symptoms might be specific only to highly homogenous groups, such as hearing voices groups [14], rather than a non-specific shared effect [23].

In the meta-regression analyses, there was no evidence that the 'therapeutic orientation', in terms of arts versus non-arts and CBT versus non-CBT studies, moderated the group effect on negative symptoms. This supports the idea that the benefit of group psychotherapeutic treatments, in terms of negative symptoms at least, is independent of a particular therapeutic approach [20]. Furthermore, there was no evidence to suggest that the degree of 'diagnostic homogeneity' moderated the effect of group psychotherapeutic treatments on negative symptoms. Therefore, the non-specific effect of negative symptoms held true for groups consisting of patients with a diagnosis of schizophrenia and related disorders [10]. However, the more 'intense' treatments were related to a greater difference in negative symptom scores. This supports the hypothesis that longer group psychotherapeutic treatments for schizophrenia are more effective than shorter treatments [22]. This result further refines the importance of the 'length' of treatment to the 'number of sessions in a given space of time' [72] as a more precise factor that may influence the effectiveness of this treatment modality [22]. Effective group mechanisms may therefore have a dose-response association, where short-term groups with few sessions do not exhaust the full potential of these mechanisms.

In conclusion, findings from this review suggest that group psychotherapeutic therapies, irrespective of their therapeutic approach, can improve negative symptoms and social functioning deficits in the treatment of schizophrenia. In support of the contextual model of psychotherapy, the impact of group mechanisms on negative symptoms appear to be non-specific and shared across a wide range of psychotherapeutic treatments delivered in a group setting. Future research should identify the non-specific mechanisms that explain the effect of group participation on negative symptoms and explore ways to strengthen them so that the therapeutic benefit is maximised.

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Disclosure Statement

The authors declare no conflicts of interest.

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