Supplementary Online Content

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This supplementary material has been provided by the authors to give readers additional information about their work

eAppendix 1. Detailed methods and supplemental results: post hoc comparisons and narrative review

Methods

The study protocol was registered on the PROSPERO database (CRD 42021259291, available at https://www.crd.york.ac.uk/prospero/display_record.php?RecordID=259291) and the PRISMA 2020 guidelines were followed.[1] The PRISMA checklist is displayed in eAppendix A. Modifications to the registered protocol include (1) the removal of causal language from the title and study objectives (i.e., the term "efficacy" has been replaced with "effectiveness"); (2) the addition of moderator analyses for study design (randomized controlled trials (RCTs), non-RCTs) and diagnosis (% schizophrenia spectrum disorders); and (3) follow-up analyses assessing the effectiveness of MCT on proximal and distal outcomes including only RCTs.

Search Strategy

The literature search strategy was developed in collaboration with a university librarian and is available in eTable 1. The search was conducted on June 3, 2021, using the following study registers and bibliographic databases: Cochrane Central Register of Controlled Trials (CENTRAL), CINAHL (EBSCO), PubMed, Embase (Ovid), MEDLINE (Ovid), PsycINFO (Ovid), Social Work Abstracts (Ovid), and Web of Science electronic bibliographic databases. Grey literature was searched using OpenGrey, ProQuest Dissertations, and Social Science Research Network eLibrary. The search strategy is presented in eTable 1. Searches were restricted to records published after 2007, the year the first paper on metacognitive training for psychosis (MCT) was published.[2] The search did not include any language restrictions. The research team was capable of screening English, French, German, and Spanish reports. When a report needed translation to verify its eligibility or extract data (n = 2) it was translated using DeepL Translator. The search was not restricted based on study design. The bibliographies of

retrieved systematic reviews/meta-analyses and included reports were screened for additional reports. The co-developer of MCT (S. Moritz) verified the comprehensiveness of the search results and to mitigate conflict of interest, was not involved in any activities pertaining to study or report selection, data extraction, quality control, nor analyses. Search updates were performed via automatic alert for the Web of Science database until data analyses were performed on September 10, 2021.

Search results were managed using Covidence®. The flowchart of report selection is presented in manuscript Figure 1. Note that per the PRISMA 2020 glossary of terms[1], a *report* is a document providing information about a particular study (e.g., a scientific paper); a *record* is the title and/or abstract of a report that has been indexed in a database or website; and a *study* is a unique investigation or clinical trial that includes a defined group of participants and at least one intervention or outcome. As such, a *study* may have several associated reports. A total of 1045 records were initially identified. After duplicate removal (n=526), all records were screened based on title and abstract by authors DP and DM. Discrepancies (n=9) were resolved by author ÉT until consensus was reached (based on majority agreement). The full-text of 294 articles were assessed for eligibility by DP and DM. Each rater screened the first 100 records and then met to resolve discrepancies (n=7) by consensus (collaborative review of inclusion/exclusion criteria until agreement was reached). The remaining records were split equally and screened independently. Included reports were published in peer-reviewed journals; books and conference abstracts were excluded unless supplemental data was retrieved (for conference abstracts) from the report author. Studies had to include participants diagnosed with a schizophrenia spectrum or related psychotic disorder. This included schizophrenia spectrum and other psychotic disorders per the categories and criteria identified in the DSM-5.[3] Given the inclusion of studies

representing real-world clinical realities, diagnoses of depression with psychotic features, dissociative disorder, and bipolar I were tolerated (when representing a minority of participants). These diagnoses were subsumed under "other psychotic disorder" for the purpose of moderator analyses. A list of all included diagnoses is available in eTable 5. There were no restrictions based on sex, gender, ethnicity, or age. Studies also had to administer the original version or adaptations of MCT for psychosis (see eTable 2 for core modules and eTable 6 for intervention characteristics). Acceptable adaptations included variability in number of sessions, number of sessions per week, and session duration. Both individual and group formats were considered.

Data extraction was performed using a template developed by author GS. The template was then piloted with GS, DP, and DM. Three reviewers (DP, DM, ÉT) then extracted the data; reports were randomly distributed among reviewers. Author GS reviewed a random selection of 10% of the extracted data for the purpose of quality control. Discrepancies were resolved via consensus (i.e., majority agreement) among the 4 reviewers. When relevant data (e.g., means and standard deviations) were not reported in the study/report, corresponding authors were contacted via e-mail. Relevant data for 12 reports were obtained using this method. Data from the most recent report were selected when multiple reports corresponded to the same study. Corresponding authors were contacted to resolve inconsistencies across reports as applicable.

Proximal and Distal Outcome Measures

Only reports that investigated selected proximal (positive symptoms, delusions, hallucinations, cognitive biases) and/or distal outcomes (self-esteem, negative symptoms, quality of life (QoL), wellbeing, social and global functioning) were included. Proximal outcomes included the direct treatment targets of MCT. Distal outcomes were identified as either (1) important secondary targets of the intervention (i.e., self-esteem); (2) person-centered outcomes (i.e., QoL, wellbeing,

functioning) important to long-term outcome;[4] and (3) negative symptoms (e.g., anhedonia, avolition, social withdrawal), which are important predictors of person-centered outcomes.[5,6] A comprehensive list of extracted variables is available in eTable 3. All measures and timepoints compatible with selected outcomes were sought.

Methodological Quality Assessment

Study risk of bias assessment was independently performed by authors DP and DM using the Mixed Methods Appraisal Tool (MMAT; version 2018).[7] MMAT methodological quality criteria and results are presented in eTable 4. Interrater agreement on 10% of randomly allocated assessments was 85.71%. Disagreements were resolved between the two authors following examination and discussion of the MMAT criteria. Incomplete outcome data was qualified (i.e., yes response on the MMAT) when attrition rates exceeded 20% in at least one participant group (treatment, control groups). This criterion was previously used in meta-analyses assessing cognitive behavioral therapy for psychosis[8] and MCT.[9] When incomplete outcome data were reported, reviewers noted whether intention-to-treat analyses were employed.

Data Synthesis Procedure

Selected outcomes were synthesized with separate meta-analyses using Comprehensive Meta-Analysis (version 3, Biostat). Reports were eligible for quantitative synthesis if they reported sample sizes, means and standard deviations, percentages and/or effect sizes with measure of variance (e.g., confidence intervals), for pre- and post-treatment outcome measures. Meta-analyses were not limited to randomized controlled trials (RCTs); the rationale was guided by Shrier et al.,[10] Borenstein et al., [11] and Efthimiou et al.[12] who suggest that if studies address a common question (treatment effects on the same outcomes), limiting meta-analyses to RCTs is arbitrary; the process of randomization does not infer study quality (the extent that a study yields

an unbiased estimate of effect). Importantly, meta-analyses based on non-RCTs typically yield similar effect size estimates to those assessing RCTs.[10] Having said that, we did assess study design as a moderator of MCT effectiveness, and ran separate meta-analyses on proximal and distal outcomes using only RCTs (analyses included 31 studies/33 reports) to verify effectiveness of the intervention on proximal and distal outcomes. Details on studies/reports included in the systematic review but ineligible for the quantitative synthesis (n=6) are displayed in manuscript Table 1 and results were outlined in a narrative review. To conduct meta-analyses, Hedges' *g* effect sizes were computed using the extracted data and interpreted as small (*g* = 0.2), medium (*g* = 0.5) and large (*g* = 0.8).[13] We selected this parameter to correct for the overestimating bias associated with the Cohen's *d* effect size known to occur for small sample studies.[11] Effect sizes were pooled for reports assessing multiple follow-up timepoints or scales measuring the same outcome.

Moderator Analyses

Subgroup analyses were conducted to explore the possible causes of expected heterogeneity. Subgroups and Q-statistics with significance tests were used for the following categorical variables: risk of bias (number of "yes" ratings ranging from 1 to 5, 1 being lowest quality, 5 being highest), type of analyses (intention-to-treat, per-protocol), study design (RCTs, non-RCTs), comparator type (none, active, passive), intervention delivery format (group, individual), manual adherence (yes, no), facilitator training (yes, no), facilitator credentials (general practitioner, graduate student, nurse, occupational therapist, psychiatrist, psychologist), number of MCT sessions (>8, 1 cycle, 2 cycles, <16, other), and gender (note: no gender-related data, i.e., data including non-binary, other, etc. categories, were reported). Post-hoc comparisons were performed for analyses with a significant omnibus test and more than 2 subgroups. Meta-

regression analyses using a random-effects model were performed for continuous variables, namely diagnosis (% schizophrenia spectrum disorders), year of publication, age, sex (% male), medication (chlorpromazine equivalent), and duration of illness.

Certainty of Evidence

Sensitivity analyses (using r values of 0.50; 0.70; 0.90) were performed to estimate the correlations between pre- and post-treatment scores when they were not reported.[14] When overall results were robust to the use of imputed correlations, a conservative value of 0.7 was employed, as recommended by Rosenthal.[15]

For each selected outcome, the potential for publication bias was verified via visual examination of the funnel plot by GS, Egger's asymmetry test, and Rosenthal's [16,17] fail-safe N. The first two indicators statistically and graphically provide estimates of whether the effect sizes of individual studies are evenly distributed around the mean effect size.[18] The later indicator denotes the required number of studies to rule out a significant overall effect size.[16]

To estimate heterogeneity of effect sizes, the Cochran's Q-statistic[19] and the I^2 index[20] were calculated. A Cochran's Q-statistic *p*-value below 0.1 was interpreted as indicating heterogeneity and I^2 indexes of 25%, 50% and 75% were construed as low, moderate, and strong heterogeneity, respectively.[21] A random-effects model was used given the anticipated differences between studies regarding test administration and MCT intervention features (e.g., individual vs group format).[22]

Supplemental Results

Post hoc comparisons of significant moderator analysis for hallucinations.

Post hoc comparisons were performed for subgroup analyses with a significant omnibus test. A significant Q-statistic was obtained for the number of MCT sessions on positive symptoms (Q4 =

10.03, p < .05) and post hoc comparisons revealed that studies providing less than 8 sessions (g = 0.97, 6 reports) had a significantly higher effect size than studies providing 2 MCT cycles (g = 0.22, 6 reports). However, effect sizes were not statistically different between studies providing 1or 2 cycles of MCT. Given the high discrepancies between studies testing the effectiveness of less than 8 MCT sessions, these results should be interpreted with caution. We observed other significant omnibus tests but did not conduct post hoc comparisons because there were too few studies in each subgroup, or the comparison was not clinically relevant (e.g., "data not reported" subgroups). The same caution is also warranted when interpreting the results of meta-regression analyses with less than 10 studies.

Narrative Review

Six studies/reports investigated the efficacy/effect of MCT on our selected outcomes but could not be included in our meta-analysis. Their characteristics are presented in manuscript Tables 1-3, and eTable 5. A summary of findings is detailed below.

An early study by Aghotor et al.[23] verified the feasibility and preliminary efficacy of MCT. They observed numerical improvements in positive symptoms (non-significant medium effect size, d = 0.43) and cognitive biases (non-significant small-to-medium effect size, d = 0.31). In a more fine-grained analysis, Schneider et al.[24] investigated the effects of MCT after each module. They found the largest improvement in positive symptoms (small effect size) following the theory of mind II module, and the greatest reduction in cognitive biases (jumping to conclusions and bias against disconfirmatory evidence, small-to-medium effect sizes) following module 3. Counter-intuitively, increases in the severity of positive symptoms and cognitive biases were observed following the modules on self-esteem (module 9) and mood (module 8). The authors hypothesized that the content of those modules may be stressful for

participants due to their highly personal relevance, which could lead to emotional avoidance and an increase in positive symptoms.

Interestingly, a case report by Kumar et al.[25] described the effect of 12 sessions of individual MCT for a patient whose delusional symptoms had not responded to pharmacological treatment and electroconvulsive therapy. Following the intervention, the authors described improvements in positive and negative symptoms, general psychopathology, as well as a reduction on a scale measuring conviction of beliefs. Improvement in interpersonal relationships and social functioning were also reported. Another study by Briki et al.[26] graphically reported improvements in general and social functioning, as well.

Regarding the ideal target population for MCT, Moritz et al.[27] identified that patients presenting with low self-esteem, poor QoL and social anxiety/withdrawal might most benefit from the intervention. Similarly, Salas-Sender et al.[28] reported larger improvements for women in personalizing bias and irrational beliefs related to dependence following MCT. They also observed that men improved more on intolerance to frustration after the intervention. Men further presented with greater improvement on jumping to conclusions measures compared to women, but the condition (experimental or control) was not specified. The authors reported no difference between sexes on positive and negative symptoms at post-intervention and follow-up.

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eAppendix 2. References of Studies Included in the Systematic Review and Meta-analysis

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eTable 1. Systematic review search strategy.

Database	Search
CENTRAL	ID Search Hits #1 MeSH descriptor: [Schizophrenia Spectrum and Other Psychotic Disorders] explode all trees 9347 #2 (schizo* or delusion* or psychosis or psychoses or psychotic* or first episode* or first-episode* or fep*) 37204 #3 ("metacognitive" NEXT train*) 138 #4 ("meta-cognitive" NEXT train*) 19 #5 MCT 1240 #6 #1 or #2 37214 #7 #3 or #4 or #5 1284 #8 #6 and #7 122 Results: 122
CINAHL	(schizo* or delusion* or psychosis or psychoses or psychotic* or first episode* or first-episode* or fep*) TX All Text AND (metacognitive train* or meta-cognitive train*) TI Title OR (metacognitive train* or meta-cognitive train*) AB Abstract OR (metacognitive train* or meta-cognitive train*) TX All Text Results: 87
PubMed	(("Schizophrenia Spectrum and Other Psychotic Disorders"[Mesh]) OR (schizo* or delusion* or psychosis or psychoses or psychotic* or first episode* or first-episode* or fep)) AND ((("metacognitive" train*) OR ("meta-cognitive" train*) OR (MCT)) AND ("2007"[Date - Publication] : "3000"[Date - Publication])) Results: 160
Embase	1 exp psychosis/ or exp acute psychosis/ or exp affective psychosis/ or exp brief psychotic disorder/ or exp childhood psychosis/ or exp delusion/ or exp depressive psychosis/ or exp endogenous psychosis/ or exp hallucination/ or exp intensive care psychosis/ or exp manic psychosis/ or exp paranoid psychosis/ or exp puerperal psychosis/ or exp schizophrenia/ 2 (schizo* or delusion* or psychos* or psychotic* or first episode* or first-episode* or fep*).mp. 3 (metacognitive train* or meta-cognitive train*).mp. 4 MCT.mp. 5 1 or 2 6 4 and 5 7 3 or 6 Results: 191
MEDLINE	exp "schizophrenia spectrum and other psychotic disorders"/ (schizo* or delusion* or psychos* or psychotic* or first episode* or first-episode* or fep*).tw,kf. (("metacognitive" adj train*) or ("meta-cognitive" adj train*)).mp. MCT.tw,kf. 1 or 2 3 or 4 5 and 6 limit 7 to yr="2007 -Current"

Database	Search
MEDLINE *(continued)*	Results: 108
PsycINFO	1 psychosis/ or exp acute psychosis/ or exp affective psychosis/ or exp childhood psychosis/ or exp chronic psychosis/ or exp "paranoia (psychosis)"/ or exp schizophrenia/ or exp paranoid schizophrenia/ 2 (schizo* or delusion* or psychos* or psychotic* or first episode* or first-episode* or fep*).mp. 3 (metacognitive train* or meta-cognitive train*).mp. 4 MCT.mp. 5 1 or 2 6 4 and 5 7 3 or 6 Results: 129
Social Work Abstracts	1 (schizo* or delusion* or psychos* or psychotic* or first episode* or first-episode* or fep*).mp. 2 (metacognitive train* or meta-cognitive train*).mp. 3 MCT.mp. 4 1 and 3 5 2 or 4 6 limit 5 to yr="2007 -Current" Results: 0
Web of Science	ALL=(schizo* or delusion* OR psychosis OR psychoses OR psychotic* OR first episode* OR first-episode* OR fep*) AND TS=(("metacognitive" NEAR train*) OR ("meta-cognitive" NEAR train*) OR (MCT)) AND PY=(2007-2021) TOPIC: (schizophrenia spectrum disorders) OR ALL FIELDS: ((schizo* or delusion* OR psychosis OR psychoses OR psychotic* OR first episode* OR first-episode* OR fep*)) AND ALL FIELDS: ((metacognitive train* OR meta-cognitive train* OR MCT)) AND YEAR PUBLISHED: (2007-2021) Results: 188
Open Grey	(schizo* OR delusion* OR psychosis OR psychoses OR psychotic* OR first episode* OR first-episode* OR fep*) AND (("meta-cognitive" NEAR train*)OR("metacognitive" NEAR train*) OR(MCT)) Results: 1
ProQuest Dissertations	(schizo* OR delusion* OR psychosis OR psychoses OR psychotic* OR first episode* OR first-episode* OR fep*) AND (("meta-cognitive training")OR("metacognitive training")) YR(>2007) Results: 59
Social Science Research Network	SSRN search terms (Medical research network; Psychology research network) (schizophrenia OR delusion OR psychosis OR psychoses OR psychotic OR first episode psychosis OR first-episode psychosis OR fep) AND ((meta-cognitive training) OR (metacognitive training)) Results: 0

Note. The search was conducted on June 3, 2021, by author DM and assisted by author DP; total search results = 1045; duplicates = 526; total studies screened = 519.

eTable 2. Core modules of metacognitive training (MCT) for psychosis.

Module	Target Domain(s)	Core Exercises
Attribution: Blaming and Taking Credit	Self-serving bias *vs* depressive attributional style	- Different causes of positive and negative events are contemplated - Explanations taking into account various causes are preferred to monocausal explanations - The negative consequences of self-serving attribution are repeatedly highlighted
Jumping to Conclusions: I	Jumping to conclusions/ liberal acceptance/ bias against disconfirmatory evidence	<u>Part I</u> - Motifs contributing to hasty decision making are discussed; disadvantages are stressed - Fragmented pictures are shown that eventually reveal objects; premature decisions often lead to errors - Emphasis on the benefits of cautious data gathering <u>Part II</u> - Ambiguous pictures are displayed often leading to omission of details - Demonstrate that first impressions often reveal only half truths
Changing Beliefs	Bias against disconfirmatory evidence	- Cartoon sequences are shown in backwards order, increasingly disambiguating a complex scenario - After each (new) picture is revealed, patients are asked to (re-)rate the plausibility of four interpretations - In some (but not all) pictures, the initial sequence is most likely interpretation prevails - Exercise encourages learning to withhold strong judgments until sufficient evidence has been collected - Encourages maintenance of an open attitude toward counterarguments and alternative views
To Empathize: I	First order theory of mind	<u>Part I</u> - Facial expression and other cues are discussed for their relevance to social reasoning. - Pictures of human faces are presented; group members guess what the depicted character(s) may be feeling - The correct answer often violates intuition, demonstrating that relying on facial expression alone can be misleading <u>Part II</u> - Cartoon strips must be completed or reorganized to display the correct order - Highlights how social inferences should involve multiple cues
Memory	Overconfidence in errors	- Discuss factors that foster or impair memory acquisition - Examples of common false memories are presented - Complex scenes are displayed with two typical elements each removed

Module	Target Domain(s)	Core Exercises
Memory *(continued)*	Overconfidence in errors	- Reliance on logical inference, gist-based recollection and liberal acceptance, many individuals falsely recognize lure items in a later recognition trial - Highlighting the constructive rather than passive nature of memory - Teach differentiation between false and correct memories using the vividness heuristic
To empathize: II	Second order theory of mind/ need for closure	- Discuss various aspects guiding theory of mind, with respect to both their heuristic value and fallibility for social decision making -Cartoon sequences are presented, observers must consider the perspective of the protagonist, which involves discounting knowledge available to the observer but not available to the protagonist - No definitive solutions can be inferred in the majority of instances, which is unsatisfactory for those with an enhanced need for closure
Jumping to Conclusions: II	Jumping to conclusions/ liberal acceptance	- The disadvantages of quick decision making are outlined with respect to events related and unrelated to psychosis - Paintings are displayed; the correct title must be deduced from four response options - Upon superficial inspection, many paintings tempt false responses
Mood	Mood	- Depressive symptoms, causes, and treatment options are discussed - Typical depressive cognitive patterns in response to common events are presented (e.g. over-generalization, selective abstraction) - Patient(s) is asked to come up with more constructive and positive responses - Convey strategies to help transform negative self-schemata and promote mood elevation
Self-Esteem	Self-esteem	- Define and discuss how low self-esteem develops - Explain the differences between low, exaggerated, and healthy self-esteem - Emphasize that knowledge and appreciation of one's strengths are the basis of healthy self-esteem - Identify that there are several sources of self-esteem -Facilitators set a healthy example by naming their own strengths; patients are encouraged to do the same -Address relationship between behavior (slouching) and mood; how good posture can enhance self-esteem - Strategies and suggestions that can be implemented in everyday life to help increase self-esteem
Stigma	Stigma	- Global aim is to challenge prejudice and to reduce self-stigmatization

Module	Target Domain(s)	Core Exercises
Stigma *(continued)*	Stigma	-Normalization of mental illness with emphasis on how not even famous people are spared from mental health problems - Highlight how people with psychological problems can also make meaningful and valuable contributions - Illustrate the high prevalence of mental disorders in the general population and convey that attenuated symptoms of psychosis are quite common - Define self-stigmatization, discuss its roots, and convey how stigmatization can harm self-esteem and self-image - Discussion on how to deal with prejudice, and how to self-advocate when feeling stigmatized - Participants will be given strategies on when and how to talk with others about their illness

Note. Summaries of the metacognitive training modules were obtained by the developers, S. Moritz and T. Woodward. In the original 8-module version, mood and self-esteem comprise module 8, and there is no module targeting stigma.

eTable 3. Comprehensive list of extracted variables.

Proximal Outcome	Extracted Rating Scale
Positive Symptoms	Brief Psychiatric Rating Scale; BPRS Scale Score Clinical Global Impression-Severity; CGI-S Green Paranoid Thought Scale; GPTS Questionnaire developed by author: Positive Symptoms Positive and Negative Syndrome Scale; PANSS Scale Score Psychotic Symptom Rating Scales; PSYRATS Scale for the Assessment of Positive Symptoms; SAPS
Delusions	Brown's Assessment of Beliefs Scale; BABS Delusion Rating Scale; DRS Experience Sampling Measure - Paranoid ideation Experience Sampling Measure - Delusional conviction GPTS Paranoia Checklist Peters et al. Delusion Inventory; PDI PSYRATS-Delusions PANSS Factor Score
Hallucinations	PANSS Factor Score PSYRATS-Hallucinations
Cognitive Biases	Bias Against Disconfirmatory Evidence (BADE) Beads Task Beads Task Variants (e.g., Fish Task) Box Task Cognitive Biases Questionnaire for Psychosis; CBQp Scale or Factor Score Davos Assessment of Cognitive Biases Scales; DACOBS Illusion of Control Task Internal, Personal, and Situational Attributions Questionnaire; IPSAQ Jumping to conclusion Fish/Lakes Task Confidence Maudsley Assessment of Delusions Scale; MADS Scale or Factor Score Probabilistic Reasoning Task Questionnaire developed by author: Jumping to Conclusions Representativeness Task
Distal Outcome	
Functioning	Global Assessment of Functioning; GAF (global functioning) Life Skills Profile (general functioning) Mini-ICF-APP (occupational and social functioning) Personal and Social Performance Scale; PSP (socially useful activities, personal and social relationships, self-care, disturbing and aggressive behaviours) Quality of Life Scale; QLS (Interpersonal Relations subscales, assesses social functioning in schizophrenia) Relationship Change Scale (social functioning, relationship satisfaction) Social Network Questionnaire; SNQ (social functioning) World Health Organization Disability Assessment Schedule 2; WHODAS 2.0 (measures global functioning via assessment of cognition, mobility, self-care, getting along, life activities (household and work/school) and participation)
Negative Symptoms	BPRS Scale Score PANSS Scale Score Scale for the Assessment of Negative Symptoms; SANS

Distal Outcome	Extracted Rating Scale
Quality of Life *(continued)*	15D EuroQoL-5D; EQ-5D Quality of Life Enjoyment and Satisfaction Questionnaire; Q-LES-Q 18 Quality of Life Scale; QLS Satisfaction Life Domains Scale Schizophrenia Quality of Life Scale; SQLS World Health Organization Disability Schedule World Health Organization Quality of life scale; WHOQOL; WHOQOL-BREF
Self-Esteem	Rosenberg Self-Esteem Scale; RSES Self-Esteem Rating Scale; SERS Self-esteem rating scale-short form; SERS-SF

eTable 4. Quality assessment rating of included studies using the Mixed Methods Appraisal Tool (MMAT).

Study Frist Author(s)	Year	Screening Questions		Randomized Controlled Trials					MMAT Score	Comments
		S1. Are there clear research questions ?	S2. Do the collected data allow to address the research questions ?	1. Is randomization appropriately performed?	2. Are the groups comparable at baseline?	3. Are there complete outcome data?	4. Are outcome assessors blinded to the intervention provided?	5 Did the participants adhere to the assigned intervention ?		
Acuna	2021	yes	yes	no	no	yes	yes	yes	3	
Aghotor	2010	yes	yes	no	yes	no	yes	yes	3	MCT had complete outcome data, control group did not; dropouts associated with discharge
Andreou	2017	yes	yes	yes	no	no	yes	no	2	ITT analyses
Balzan	2019	yes	yes	yes	no	yes	yes	yes	4	
Briki	2014 b	yes	yes	no	yes	no	yes	no	2	
Chen	2021	yes	yes	no	yes	yes	yes	yes	4	
de Pinho	2020	yes	yes	yes	yes	yes	yes	yes	5	ITT analyses; manuscript does not report dropouts who completed pre but not post and/or follow up
Favrod	2014	yes	yes	no	yes	yes	yes	yes	4	
Fekete	UD	yes	yes	yes	yes	no	yes	yes	4	Incomplete outcome data is due to dropout from the control group; ITT analyses
Fujii	2017	yes	yes	yes	yes	no	no	no	2	
Gaweda	2015	yes	yes	yes	yes	yes	no	yes	4	
Ishikawa	2020	yes	yes	yes	yes	yes	yes	yes	5	ITT analyses
Kowalski	2017	yes	yes	no	no	no	no	yes	1	
Kumar	2010	yes	yes	yes	yes	no	no	no	2	

Study Frist Author(s)	Year	Screening Questions		Randomized Controlled Trials					MMAT Score	Comments
		S1. Are there clear research questions ?	S2. Do the collected data allow to address the research questions ?	1. Is randomization appropriately performed?	2. Are the groups comparable at baseline?	3. Are there complete outcome data?	4. Are outcome assessors blinded to the intervention provided?	5 Did the participants adhere to the assigned intervention ?		
Kuokkanen Kuokkanen	2014 2015	yes	yes	yes	yes	yes	yes	yes	5	
Lopez-Morinigo	UD	yes	yes	yes	yes	no	yes	no	3	
Moritz	2011 a	yes	yes	yes	yes	yes	yes	yes	5	
Moritz	2011 b	yes	yes	yes	yes	yes	yes	yes	5	ITT analyses
Moritz Moritz Moritz	2013 2014 2018	yes	yes	no	yes	yes	yes	yes	4	ITT analyses; Moritz (2018) not included in quantitative analyses
Ochoa Salas-Sender	2017 2020	yes	yes	yes	yes	no	yes	no	3	Salas-Sender (2020) not included in quantitative analyses
Ochoa	2020	yes	yes	no	no	no	yes	no	3	Rating based on a conference abstract + supplemental info provided by the author
Park	2020	yes	yes	no	yes	no	no	yes	2	ITT analyses; post treatment data not reported for all measures
Pos	2018	yes	yes	no	no	no	yes	yes	2	
Shan	2021	yes	yes	yes	yes	yes	yes	yes	5	
So	2015	yes	yes	no	yes	no	yes	no	2	ITT analyses
So	2021	yes	yes	no	yes	no	yes	no	2	ITT analyses
van Oosterhout	2014	yes	yes	yes	yes	no	yes	yes	4	ITT analyses

Study Frist Author(s)	Year	Screening Questions		Randomized Controlled Trials					MMAT Score	Comments
		S1. Are there clear research questions ?	S2. Do the collected data allow to address the research questions ?	1. Is randomization appropriately performed?	2. Are the groups comparable at baseline?	3. Are there complete outcome data?	4. Are outcome assessors blinded to the intervention provided?	5 Did the participants adhere to the assigned intervention ?		
Yildiz	2019	yes	yes	no	yes	yes	yes	yes	4	
Zalzala	2019	yes	yes	no	yes	yes	no	yes	3	Rating based on a conference abstract + supplemental table provided by the author

Note. Ratings were randomly allocated to two independent reviewers (DP and DM); interrater agreement was 85. 71%, established for 10% of studies randomly allocated to both reviewers; discrepancies were resolved via consensus; all study designs are based on 5 methodological quality criteria, where the highest possible score is 5 (indicating the highest quality) and the lowest possible score is 0 (indicating the lowest quality; possible responses on all items include “yes” = criterium met; “no” = criterium not met; “can’t tell” = inadequate information to assess a given criterium; incomplete outcome data was qualified by attrition rates exceeding 20% in at least one study group (i.e., treatment or control); UD = unpublished data; ITT = intention-to-treat; a = unpublished data from our group, thus an independent reviewer (A.E. de Sousa) from our group but with no conflict of interest (neither in regard to the unpublished data nor the current systematic review and meta-analysis) rated MMAT criteria; columns assessing qualitive and mixed method studies were not included in the table given no such studies were identified in our search; for more information: http://mixedmethodsappraisaltoolpublic.pbworks.com/.

Study First Author(s)	Year	Screening Questions		Non-randomized Controlled Trials					MMAT Score	Comments
		S1. Are there clear research questions?	S2. Do the collected data allow to address the research questions?	1. Are the participants representative of the target population?	2. Are measurements appropriate regarding both the outcome and intervention (or exposure)?	3. Are there complete outcome data?	4. Are the confounders accounted for in the design and analysis?	5. During the study period, is the intervention administered (or exposure occurred) as intended?		
Andreou	2018	yes	yes	no	yes	yes	yes	yes	4	
Balzan	2014	yes	yes	yes	yes	yes	yes	yes	5	
Erawati	2014	yes	yes	yes	yes	yes	no	yes	4	
Favrod	2011	yes	yes	yes	yes	no	no	yes	3	
Ferwerda	2010	yes	yes	can't tell	yes	can't tell	no	can't tell	1	
Naughton	2012	yes	yes	can't tell	yes	yes	yes	yes	4	
Raucher-Chene	UD	yes	yes	yes	yes	no	no	yes	3	Completion rate was variable across outcomes ranging from 53.85% - 69.23% for all outcomes
Schneider	2018	yes	yes	can't tell	no	can't tell	no	yes	1	
Simon-Exposito	2019	yes	yes	yes	yes	yes	yes	yes	5	
Tanoue	2021	yes	yes	yes	yes	no	no	can't tell	2	ITT analyses
Ussorio	2016	yes	yes	yes	yes	yes	yes	yes	5	

Note. Ratings were randomly allocated to two independent reviewers (DP and DM); interrater agreement was 85. 71%, established for 10% of studies randomly allocated to both reviewers; discrepancies were resolved via consensus; all study designs are based on 5 methodological quality criteria, where the highest possible score is 5 (indicating the highest quality) and the lowest possible score is 0 (indicating the lowest quality; possible responses on all items include “yes” = criterium met; “no” = criterium not met; “can’t tell” = inadequate information to assess a given criterium; incomplete outcome data was qualified by attrition rates exceeding 20% in at least one study group (i.e., treatment or control); UD = unpublished data; ITT = intention-to-treat; a = unpublished data from our group, thus an independent reviewer (A.E. de Sousa) from our group but with no conflict of interest (neither in regard to the unpublished data nor the current systematic review and meta-analysis) rated MMAT criteria; columns assessing qualitive and mixed method studies were not included in the table given no such studies were identified in our search; for more information: http://mixedmethodsappraisaltoolpublic.pbworks.com/.

Study First Author(s)	Year	Screening Questions		Quantitative Descriptive Studies						
		S1. Are there clear research questions?	S2. Do the collected data allow to address the research questions?	1. Is the sampling strategy relevant to address the research question?	2. Is the sample representative of the target population?	3. Are the measurements appropriate?	4. Is the risk of nonresponse bias low?	5. Is the statistical analysis appropriate to answer the research question?		
Briki	2014a	yes	yes	yes	yes	yes	yes	yes	5	
Kumar	2015	no	can't tell	can't tell	yes	yes	yes	N/A	3	Case report; data were not analyzed

Note. Ratings were randomly allocated to two independent reviewers (DP and DM); interrater agreement was 85. 71%, established for 10% of studies randomly allocated to both reviewers; discrepancies were resolved via consensus; all study designs are based on 5 methodological quality criteria, where the highest possible score is 5 (indicating the highest quality) and the lowest possible score is 0 (indicating the lowest quality; possible responses on all items include “yes” = criterium met; “no” = criterium not met; “can’t tell” = inadequate information to assess a given criterium; incomplete outcome data was qualified by attrition rates exceeding 20% in at least one study group (i.e., treatment or control); UD = unpublished data; ITT = intention-to-treat; a = unpublished data from our group, thus an independent reviewer (A.E. de Sousa) from our group but with no conflict of interest (neither in regard to the unpublished data nor the current systematic review and meta-analysis) rated MMAT criteria; columns assessing qualitive and mixed method studies were not included in the table given no such studies were identified in our search; for more information: http://mixedmethodsappraisaltoolpublic.pbworks.com/.

eTable 5. Supplemental description of included studies.

First Author(s)	Year	Diagnosis	Age Range	% N Antipsy	Dose EQ (mean)	Dose EQ (SD)	Outcome (measure)	FUP
Acuna	2021	SSD	ExpGr (18-45); CtrlGr (19-36)	100%	ExpGr (653.4); CtrlGr (542.85)	ExpGr (363.68); CtrlGr (282.30)	Positive sx (PANSS positive); Negative sx (PANSS negative); Cognitive bias (CBQp jumping to conclusions, total)	N/A
Aghotor	2010	SSD	ExpGr (18–48); CtrlGr (22–62)	N/R	N/R	N/R	Positive sx (PANSS positive); Cognitive bias (BADE)	N/A
Andreou	2017	ExpGr: SSD(46); CtrlGr: SSD (46)	N/R	N/R	ExpGr (344.56); CtrlGr (305.49)	ExpGr (424); CtrlGr (393.5)	Delusions (PSYRATS delusions, PANSS: P1); Positive sx (PANSS positive); Negative sx (PANSS negative); Cognitive bias (Fish task variants); Self-esteem (RSES); QoL (WHOQOL: Physical, Psychological; WHOQOL BREF: Psychological, Relations, Environment)	24
Andreou	2018	ExpGr schizophrenia (26)	N/R	50%	828.15	806.6	Positive sx (PANSS positive); Delusions (PANSS: P1); Negative sx (PANSS negative); Cognitive bias (Fish task, Box task variants)	N/A
Balzan	2014	ExpGr: schizophrenia (14); CtrlGr: schizophrenia (14)	N/R	100%	N/R	N/R	Positive sx (PANSS positive, SAPS); Delusions (PANSS: P1, PDI); QoL (WHOQOL: Psychological, Social); Cognitive bias (Representativeness task variants, Illusion of Control task variants)	N/A
Balzan	2019	ExpGr schizophrenia (18), schizoaffective (6), other psychotic disorder (3);	N/R	96%	ExpGr (609.11); CtrlGr (425)	ExpGr (420.7); CtrlGr (361.68)	Positive sx (PANSS positive); Delusions (PANSS: P1, PSYRATS delusions); Negative sx (PANSS negative); Cognitive	N/A

First Author(s)	Year	Diagnosis	Age Range	% N Antipsy	Dose EQ (mean)	Dose EQ (SD)	Outcome (measure)	FUP
Balzan *(continued)*	2019	CtrlGr schizophrenia (20), schizoaffective (5), other psychotic disorder (2)					bias (Beads task: Jumping to conclusions)	
Balzan	2019	ExpGr schizophrenia (18), schizoaffective (6), other psychotic disorder (3); CtrlGr schizophrenia (20), schizoaffective (5), other psychotic disorder (2)	N/R	96%	ExpGr (609.11); CtrlGr (425)	ExpGr (420.7); CtrlGr (361.68)	Positive sx (PANSS positive); Delusions (PANSS: P1, PSYRATS delusions); Negative sx (PANSS negative); Cognitive bias (Beads task: Jumping to conclusions)	224
Briki [a]	2014a	SSD	N/R	100%	N/R	N/R	Functioning (ILSS social relationships, total)	N/A
Briki	2014b	SSD	N/R	100%	ExpGr (1519); CtrlGr (1359)	ExpGr (1635); CtrlGr (1516)	Positive sx (PANSS positive); Hallucinations (PANSS: P3, PSYRATS hallucinations); Delusions (PANSS: P1, P6; PSYRATS delusions); Functioning (QLS, Interpersonal Relations Subscales: social initiatives, social circle)	N/A
Chen	2021	ExpGr schizophrenia (58); CtrlGr schizophrenia (62)	N/R	N/R	N/R	N/R	Positive sx (PANSS positive, PSYRATS total); Delusions (PSYRATS delusions, PANSS core delusions); Hallucinations (PSYRATS hallucinations); Negative sx (PANSS negative); QoL (SQLS: Psychosocial, Motivation and energy, Symptoms and side effects)	N/A
de Pinho	2020	schizophrenia	N/R	100%	N/R	N/R	Positive sx (PSYRATS total); Delusions (PSYRATS delusions); Hallucinations (PSYRATS hallucinations);	12
First Author(s)	**Year**	**Diagnosis**	**Age Range**	**% N Antipsy**	**Dose EQ (mean)**	**Dose EQ (SD)**	**Outcome (measure)**	**FUP**

de Pinho *(continued)*	2020						Functioning (PSP, WHODAS 2.0)	
Erawati	2014	SSD	N/R	N/R	N/R	N/R	Delusions (PSYRATS delusions)	N/A
Favrod	2011	schizophrenia (16); schizoaffective (2)	N/R	100%	N/R	N/R	Delusions (PANSS: P1, PSYRATS delusions); Hallucinations (PANSS: P3, PSYRATS hallucinations)	N/A
Favrod [b]	2014	ExpGr schizophrenia (21) schizoaffective (5); CtrlGr schizophrenia (22) schizoaffective disorders (4)	N/R	100%	ExpGr (422); CtrlGr (379)	ExpGr (218); CtrlGr (163)	Positive sx (PANSS positive); Delusions (PSYRATS delusions)	26
Fekete	UD	SSD	N/R	100%	ExpGr (14.26); CtrlGr (11.43)	ExpGr (9.40); CtrlGr (6.20)	Positive sx (PANSS positive); Negative sx (PANSS negative)	8
Ferwerda	2010	paranoid schizophrenia (29)	N/R	100%	N/R	N/R	Delusions (DRS total, GPTS total); Cognitive bias (Beads task variants); Self-esteem (SERS-SF 20 positive, negative)	N/A
Fujii [c]	2021	schizophrenia	N/R	100%	GrA (1117.24); GrB (1033.25)	GrA (686.94); GrB (419.74)	Positive sx (PANSS positive); Negative sx (PANSS negative); Functioning (GAF)	N/A
Gaweda	2015	ExpGr schizophrenia (23); CtrlGr schizophrenia (21)	N/R	100%	ExpGr (531.75); CtrlGr (440)	ExpGr (389.23); CtrlGr (372.34)	Delusions (PSYRATS delusions, Paranoia checklist: frequency, conviction conviction, distress); Hallucinations (PSYRATS hallucinations); Cognitive bias (CBQp total)	N/A
Ishikawa	2020	ExpGr schizophrenia disorders (25); schizotypal (1); CtrlGr schizophrenia disorders (23); schizoaffective (1)	N/R	N/R	ExpGr (720.82); CtrlGr (804.97)	ExpGr (402.27); ExpGr (505.32)	Positive sx (PANSS positive); Delusions (PANSS core delusions); Hallucinations (PANSS: P3); Cognitive bias; (CBQ)(jumping to conclusions); Functioning (GAF); QoL (EQ-5D-EL); Self-esteem (RSES)	4

First Author(s)	Year	Diagnosis	Age Range	% N Antipsy	Dose EQ (mean)	Dose EQ (SD)	Outcome (measure)	FUP
Kowalski [c]	2017	29 paranoid schizophrenia, 1 unspecified schizophrenia, 1 acute polymorphic psychotic disorder with schizophrenia symptoms	N/R	N/R	ExpGr (810); CtrlGr (797)	ExpGr (362); CtrlGr (351)	Delusions (Paranoia Checklist: Intensity, Conviction, Distress); Cognitive bias (Fish task variants)	N/A
Kumar	2010	paranoid schizophrenia	N/R	100%	N/R	N/R	Positive sx (PANSS positive); Delusions (BABS); Negative sx (PANSS negative)	N/A
Kumar	2015	paranoid schizophrenia	N/A	N/A	N/R	N/R	Positive sx (PANSS positive); Delusions (BABS); Negative sx (PANSS negative)	N/A
Kuokkanen	2014 2015	ExpGr schizophrenia (10 with 4 forensic and 6 non-forensic); CtrlGr (10 with 6 forensic and 4 non-forensic)	ExpGr (28-56); CtrlGr (19-67)	N/R	N/R	N/R	Positive sx (PANSS positive); Delusions (PANSS: P1, PSYRATS: Preoccupation. Duration preoccupation, Conviction, Amount of distress, Intensity of distress, Disruption); Cognitive bias (Fish task variants); QoL (15D: Depression, Distress, Index)	12; 24
Lopez-Morinigo	UD*	ExpGr schizophrenia (23), other SSD (16); CtrlGr schizophrenia (25), other SSD (13)	N/R	N/R	ExpGr (442.3); CtrlGr (461.2)	ExpGr (310); CtrlGr (387.1)	Positive sx (PANSS positive); Negative sx (PANSS negative); Cognitive bias (Beads task variants); Functioning (GAF, World Health Organization Disability Schedule); QoL (Satisfaction Life Domains Scale)	40
Moritz	2011 a	SSD	N/R	N/R	ExpGr (65.42); CtrlGr (66.76)	ExpGr (46.32); CtrlGr (42.86)	Positive sx (PANSS positive); Delusions (PSYRATS delusions); Hallucinations (PSYRATS hallucinations);	N/A
First Author(s)	**Year**	**Diagnosis**	**Age Range**	**% N Antipsy**	**Dose EQ (mean)**	**Dose EQ (SD)**	**Outcome (measure)**	**FUP**
Moritz *(continued)*	2011 a						Negative sx (PANSS negative);	

							Cognitive bias (Fish task variants); QoL (WHOQOL-BREF)	
Moritz	2011b	SSD	N/R	78%	N/R	N/R	Delusions (PANSS core delusions, PSYRATS delusions); Hallucinations (PSYRATS hallucinations); Cognitive bias (Beads task variant)	N/A
Moritz	2013	SSD	N/R	100%	ExpGr (69.72%); CtrlGrp (80.96%)	ExpGr (59.06); CtrlGrp (63.37)	Positive sx (PANSS positive); Delusions (PANSS core delusions, PSYRATS delusions); Hallucinations (PSYRATS hallucinations); Cognitive bias (Fish task variants); Self-esteem (RSES)	24
	2014				ExpGr (72.37%); CtrlGrp (79.71%)	ExpGr (61.59); CtrlGrp (63.20)	Self-esteem (RSES); QoL (WHOQOL-BREF: total)	156
	2018				ExpGr (69.72%); CtrlGrp (80.96%)	ExpGr (59.06); CtrlGrp (63.37)	QoL (WHOQOL total); Self-esteem (RSES); Cognitive bias (CBQp total, Number of admissions); Self-esteem (RSES)	24; 156
Naughton	2012	ExpGr schizophrenia (7), schizoaffective (3), major depression with psychotic features (7); CtrlGr schizophrenia (8)	N/R	100%	N/R	N/R	Positive sx (PANSS positive); Negative sx (PANSS negative); Functioning (GAF)	N/A

First Author(s)	Year	Diagnosis	Age Range	% N Antipsy	Dose EQ (mean)	Dose EQ (SD)	Outcome (measure)	FUP
Ochoa Salas-Sender	2017 2020	SSD	N/R	100%	ExpGr (472.53); CtrlGr (519.49)	ExpGr (703.89); CtrlGr (534.58)	Positive sx (PANSS positive); Negative sx (PANSS negative); Functioning (GAF); Cognitive bias (IPSAQ: Externalizing bias Personalizing bias, Beads task variants)	
Ochoa	2020	SSD	N/R	100%	N/R	N/R	Positive sx (PANSS positive); Delusions (PANSS: P1); Negative sx (PANSS negative); Functioning (GAF); Self-esteem (RSES)	N/A
Park	2020	schizophrenia	N/R	N/R	N/R	N/R	Positive sx (SAPS); Negative sx (SANS); Functioning (Relationship Change Scale)	N/A
Pos	2018	ExpGr schizophrenia or schizophreniform (15), psychotic disorder NOS (3), schizoaffective (2), other disorder with psychotic sx (5); CtrlGr schizophrenia or schizophreniform disorder (15), psychotic disorder NOS (6) schizoaffective (1), other disorder with psychotic symptoms (3)	N/R	ExpGr (95%); CtrlGr (96%)	N/R	N/R	Delusions (Experience Sampling Measure: Paranoid ideation, Delusional conviction); Cognitive bias (Beads task: Jumping to Conclusions)	N/A
Raucher-Chene	UD	schizophrenia (4); schizoaffective (2); dissociative disorder (1); bipolar I (1); major depressive disorder (1); other specified SSD (1); unspecified SSD (4)	(20-51)	91.67%	(397.0)	(226.2)	Positive sx (PANSS-6 total); Wellbeing (WEMWBS); Functioning (PSP); Cognitive bias (Beads task variants, DACOBS); QoL (Q-LES-Q 18)	N/A
Schneider	2018	schizophrenia (100); brief psychotic disorder (13); bipolar disorder (29); schizoaffective (23); other (11)	N/R	95%	N/R	N/R	Positive sx (questionnaire developed for study: positive symptoms); Cognitive bias (questionnaire developed for study: Jumping to conclusions, BADE)	N/A

First Author(s)	Year	Diagnosis	Age Range	% N Antipsy	Dose EQ (mean)	Dose EQ (SD)	Outcome (measure)	FUP
Shan	2021	schizophrenia	18-38	100%	N/R	N/R	Positive sx (PANSS positive); Negative sx (PANSS negative)	N/A
Simon-Exposito	2019	ExpGr schizophrenia (11); CtrlGr schizophrenia (11)	N/R	N/R	N/R	N/R	Positive sx (PANSS: G12, P6); Delusions (PANSS: P1); Hallucinations (PANSS: P3)	N/A
So	2015	schizophrenia (25); delusional disorder (8); schizoaffective (1) psychotic disorder NOS (3); depression with psychotic symptoms (3); bipolar disorder (1); unknown (3)	N/R	98%	ExpGr (217.36); CtrlGr (336.79)	ExpGr (172.37); CtrlGr (248.41)	Positive sx (PANSS positive); Delusions (PANSS: P1, PSYRATS delusions); Cognitive bias (MADS, Beads task variants)	4
So	2021	schizophrenia (36); delusional disorder (18); psychotic disorder NOS (2)	N/R	N/R	(492.04)	(415.64)	Positive sx (PANSS positive); Delusions (PSYRATS delusions); Negative sx (PANSS negative); Cognitive bias (MADS, BADE tasks)	4; 24
Tanoue [d]	2021	schizophrenia	N/R	36.36%	347.3	187.4	Positive sx (PANSS positive); Cognitive bias (CBQp jumping to conclusions, total); QoL (EuroQOL 5 dimensions 5-level); Functioning (GAF)	4
Ussorio	2016	ExpGr SSD or affective psychosis (56)	N/R	100%	ExpGr (109,9); CtrlGr (114,4)	ExpGr (65); CtrlGr (79,7)	Positive sx (PANSS positive); Negative sx (PANSS negative); Functioning (PSP, SNQ); Self-esteem (SERS)	N/A
van Oosterhout	2014	ExpGr schizophrenia (52), psychotic disorder NOS (9), schizoaffective (3), other (11); CtrlGr schizophrenia (46), psychotic disorder NOS (9), schizoaffective (5), other (19)	16-55	ExpGr (93%); CtrlGr (91%)	ExpGr (379.5); CtrlGr (284)	Standard error: ExpGr (70,5); CtrlGr (38)	Delusions (DRS, GPTS); Cognitive bias (DACOBS: Subjective cognitive problems, Social cognition problems)	16

First Author(s)	Year	Diagnosis	Age Range	% N Antipsy	Dose EQ (mean)	Dose EQ (SD)	Outcome (measure)	FUP
Yildiz	2019	ExpGr schizophrenia (10); CtrlGr schizophrenia (10)	N/R	N/R	N/R	N/R	Positive sx (CGI-Severity); Functioning (GAF, QLS)	N/A
Zalzala	2019	ExpGr 50% schizoaffective, 50% schizophrenia; CtrlGr 53% schizoaffective, 47% schizophrenia	N/R	ExpGr (69); CtrlGr (75)	N/R	N/R	Positive sx (BPRS positive); Negative sx (BPRS negative)	8

Note. % N Antipsy = percentage of the sample taking antipsychotic medication(s); Dose EQ = chlorpromazine equivalent; FUP = length from post evaluation to follow-up, in weeks; ExpGr = experimental group (i.e., metacognitive training); CtrlGr = control group; sx = symptoms; N/R = not rated; N/A = not applicable; outcome measure: see eTable 3 for measure acronyms; SSD = schizophrenic spectrum disorder; UD = unpublished data; QoL = quality of life; a = antipsychotic medication % inferred from "Participants were on stable neuroleptic medication"; b = antipsychotic medication %: ambiguous, but stable dose of antipsychotic was an inclusion criterion; c = Crossover study; d = Transdiagnostic study wherein 22 (64.7%) of participants had schizophrenia, outcome data is schizophrenia-specific; *for more information regarding unpublished data from Lopez-Morinigo contact jlmorinigo@salud.madrid.org

eTable 6. Metacognitive training (MCT) intervention characteristics of included studies.

Study First Author(s)	Year	Sessions	Sessions per week	Session Duration	Format	Facilitator Credentials	Other Facilitator Credentials	Number of Facilitators	Facilitator Training	Manual Adherence
Acuna	2021	10	1	45-60	Group	Psychiatrist	Psychologist	2	N/R	Yes
Aghotor	2010	8	2	45-60	Group	N/R	N/R	N/R	Yes	No [a]
Andreou	2017	12	2	45-60	INDV	Psychologist	N/A	N/R	N/R	N/R
Andreou	2018	8	2	45-60	Group	N/R	N/R	N/R	N/R	N/R
Balzan	2014	1	1	60	INDV	N/R	N/R	N/R	N/R	No [g]
Balzan	2019	4	1	120	INDV	Psychologist	N/R	N/R	Yes	Yes
Briki	2014 (a)	10	1 or 2 [b]	60	Group	N/R	N/R	2	Yes	N/R
Briki	2014 (b)	16	2	60	Group	Psychiatrist	Psychiatric nurses; Physician interns; Psychologists	N/R	Yes	Yes
Chen	2021	8	1	60	Group [c]	General practitioner	N/A	1	Yes	N/R
de Pinho	2020	8	2	45-60	Group	Nurse	N/A	N/R	Yes	Yes
Erawati	2014	8	2	45-60	INDV	Nurse	N/A	1	N/R	N/R
Favrod	2011	8 or 16 [d]	1	60	Group	Nurse	Research assistant; Nursing assistant	2 or 3	N/R	N/R

Study First Author(s)	Year	Sessions	Sessions per week	Session Duration	Format	Facilitator Credentials	Other Facilitator Credentials	Number of Facilitators	Facilitator Training	Manual Adherence
Favrod	2014	8	1	60	Group	N/R	N/R	N/R	N/R	N/R
Fekete	UD	16	1	45-60 [e]	Group	N/R	N/A	1	N/R	Yes
Ferwerda	2010	8	2 [f]	45-60	Group	N/R	N/R	N/R	N/R	Yes
Fujii	2021	16	1	60	Group	Occupational therapist	Occupational therapist	2	N/R	Yes
Gaweda	2015	8	2	45-60	Group	Graduate student	N/R	NR	Yes	Yes
Ishikawa	2020	10	1	45-60	Group	Occupational therapist	Psychiatrist; Psychiatric nurse	N/R	Yes	Yes
Kowalski	2017	1	1	N/R	Group	N/R	N/R	N/R	N/R	No [g]
Kumar	2010	8 [h]	2	45-60	Group [h]	N/R	N/R	N/R	N/R	N/R
Kumar	2015	12	N/R	45-60	INDV	N/R	N/R	N/R	N/R	Yes
Kuokkanen Kuokkanen	2014 2015	8	2	45	Group	Psychologist	N/A	2	Yes	Yes
Lopez-Morinigo	UD	8	1	45-60	Group	Psychologist	N/A	1	Yes	Yes
Moritz	2011 (a)	8	1	45-60	Group	Psychologist	Graduate student	N/R	N/R	Yes
Moritz	2011 (b)	MCT; MCT+ [i]	2	45-60	Group; INDV	Psychologist	MCT (Intern)	MCT (2); MCT+ (1)	N/R	N/R
Moritz Moritz Moritz	2013 2014 2018	8 to16 [j]	2	45-60	Group	Psychologist	Psychologist trainees	N/R	Yes	Yes

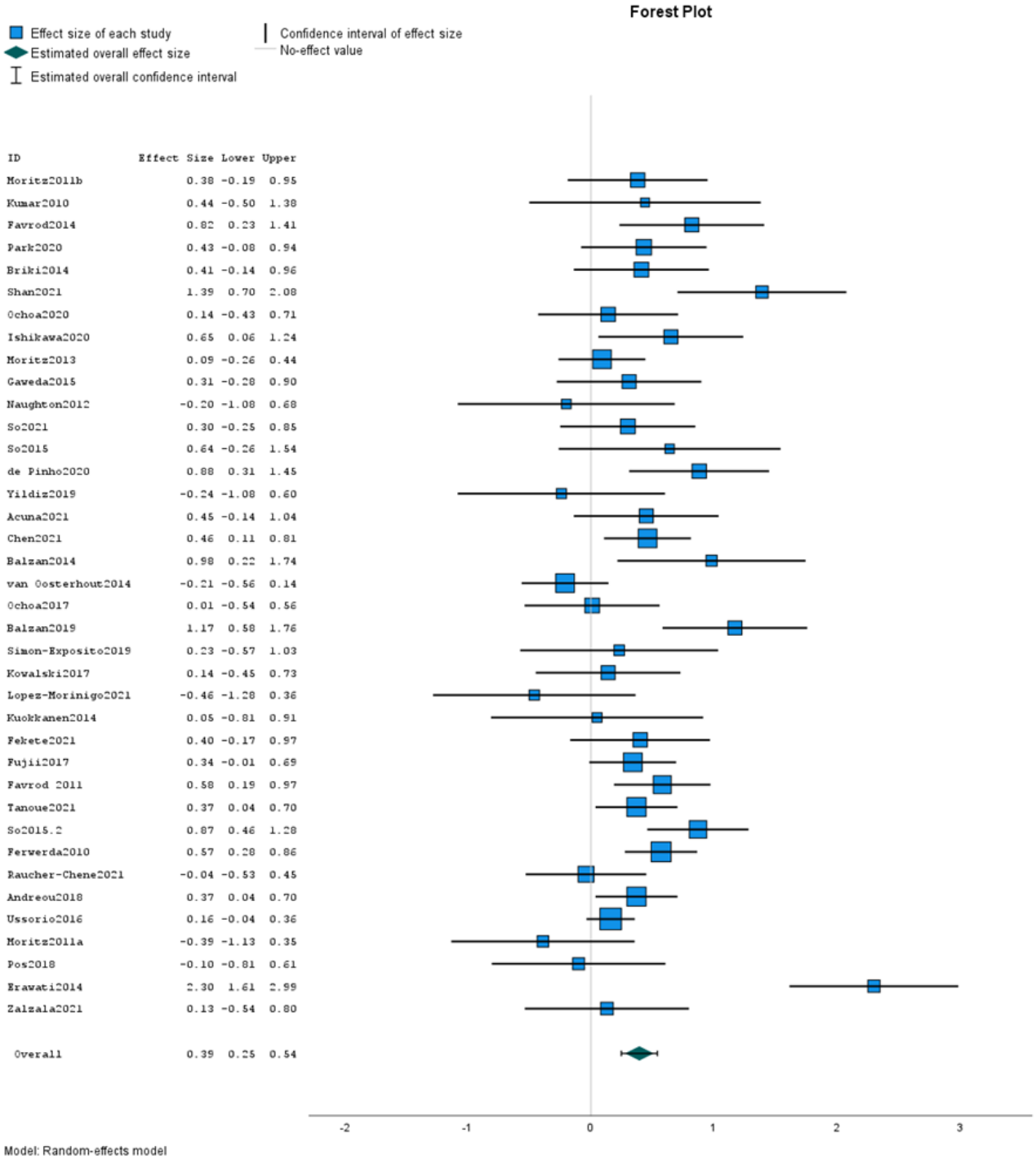
Study First Author(s)	Year	Sessions	Sessions per week	Session Duration	Format	Facilitator Credentials	Other Facilitator Credentials	Number of Facilitators	Facilitator Training	Manual Adherence
Naughton	2012	16	2	N/R	Group	Psychiatrist	Clinical nurse specialist	2	Yes	N/R
Ochoa Salas-Sender	2017 2020	8	1	60	Group	Psychologist	Psychiatrist; Nurse	2	Yes	Yes
Ochoa	2020	10	1	N/R	INDV	Psychologist	Psychologist; Psychiatrist [k]	1	Yes	Yes
Park	2020	18	1 to 2	60	N/R	N/R	N/R	N/R	N/R	N/R
Pos	2018	8	1	N/R [l]	Group	Nurse	N/A	1	Yes	Yes
Raucher-Chene	UD	12	2	45-60	Group-virtual	Psychologist	Psychiatrist	≥ 2	Yes	Yes
Schneider	2018	≤ 20	2	N/R	Group	Graduate student	N/R	2	Yes	N/R
Shan	2021	8	1	45-60	Group	Psychiatrist	N/A	1	Yes	Yes
Simon-Exposito	2019	16	2	N/R	Group	Psychologist	N/R	2	Yes	Yes
So	2015	4	1	60	INDV	Psychologist	N/R	1	Yes	Yes
So	2021	4	1	45-60	Group	Psychologist	Psychiatrists	N/R	N/R	Yes
Tanoue	2021	10	1	60	Group	Nurse	Occupational therapist; Psychiatric social worker	1 or 2	Yes	N/R
Ussorio	2016	16	1	45-60	Group	Psychologist	Psychiatric rehabilitation technician	2	Yes	Yes

Study First Author(s)	Year	Sessions	Sessions per week	Session Duration	Format	Facilitator Credentials	Other Facilitator Credentials	Number of Facilitators	Facilitator Training	Manual Adherence
van Oosterhout	2014	8	1	N/R	Group	Psychologist	Psychiatrist; Occupational therapist; Psychiatric nurse	2	Yes	Yes
Yildiz	2019	40	2	40-50	Group	N/R	N/R	2	Yes	N/R
Zalzala	2019	8	1	N/R	Group	N/R	N/R	N/R	N/R	N/R

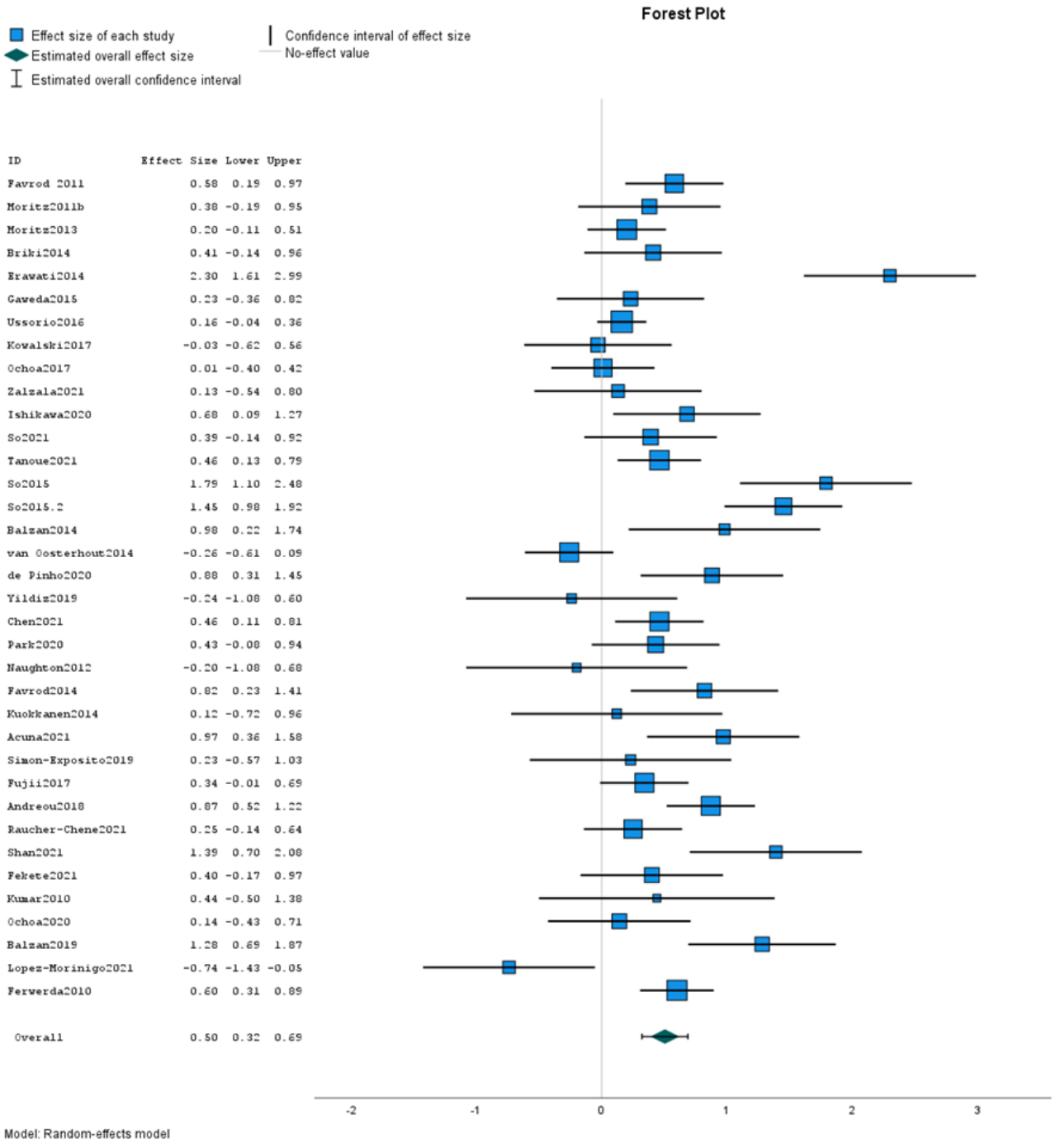
Note. Reports presented in the same row are from the same study trial; MCT = metacognitive training; MCT + = individualized MCT; N/R = not rated in the study; N/A = not applicable; UD = unpublished data; a = manual was updated during the intervention; b = inferred given 10 sessions were administered over 8 weeks; c = participants were compensated $5 after each session; d = participants completed either 1 (8 week) or 2 (16 week) cycles over 8 months; e = inferred given standard metacognitive training was reported; f = inferred given description of MCT in introduction; g = 1 MCT session delivered; h = inferred given 2 sessions per week for 4 weeks and implied in description of MCT in introduction; i = 1 MCT+ session related to medical history; j = all participants received a maximum of 8 sessions prior to post assessment and were invited to complete another cycle of 8 sessions immediately thereafter; k = facilitator credentials at other cites; l = a link to the study protocol (in Dutch) was provided in the manuscript.

eFigure 1. Forest plots by outcome for the pre-post comparisons.
Effect sizes (Hedges' g) and their 95% confidence intervals for each study/report, with positive values favoring MCT and negative values favoring the control condition.

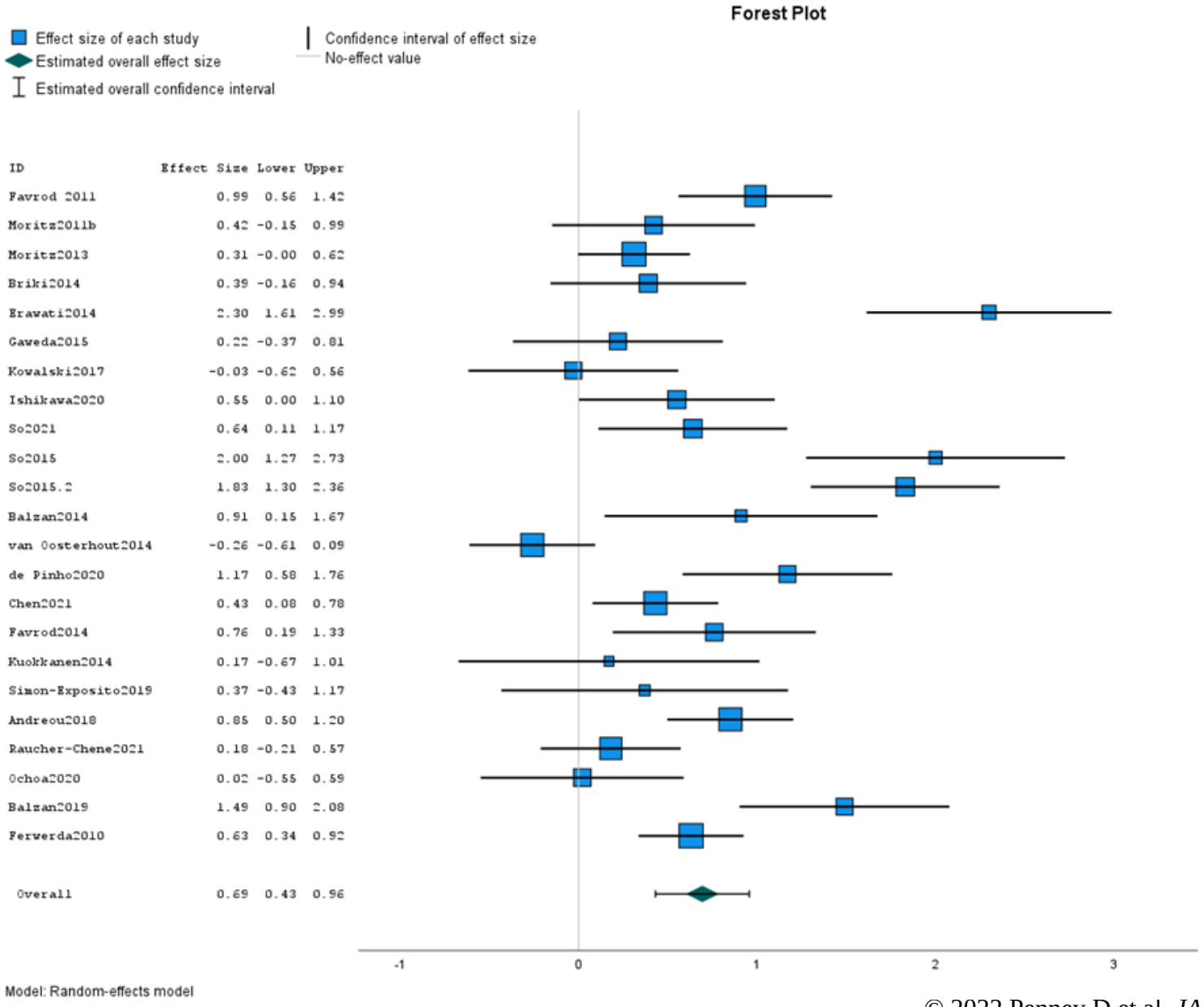
(a) Proximal outcomes



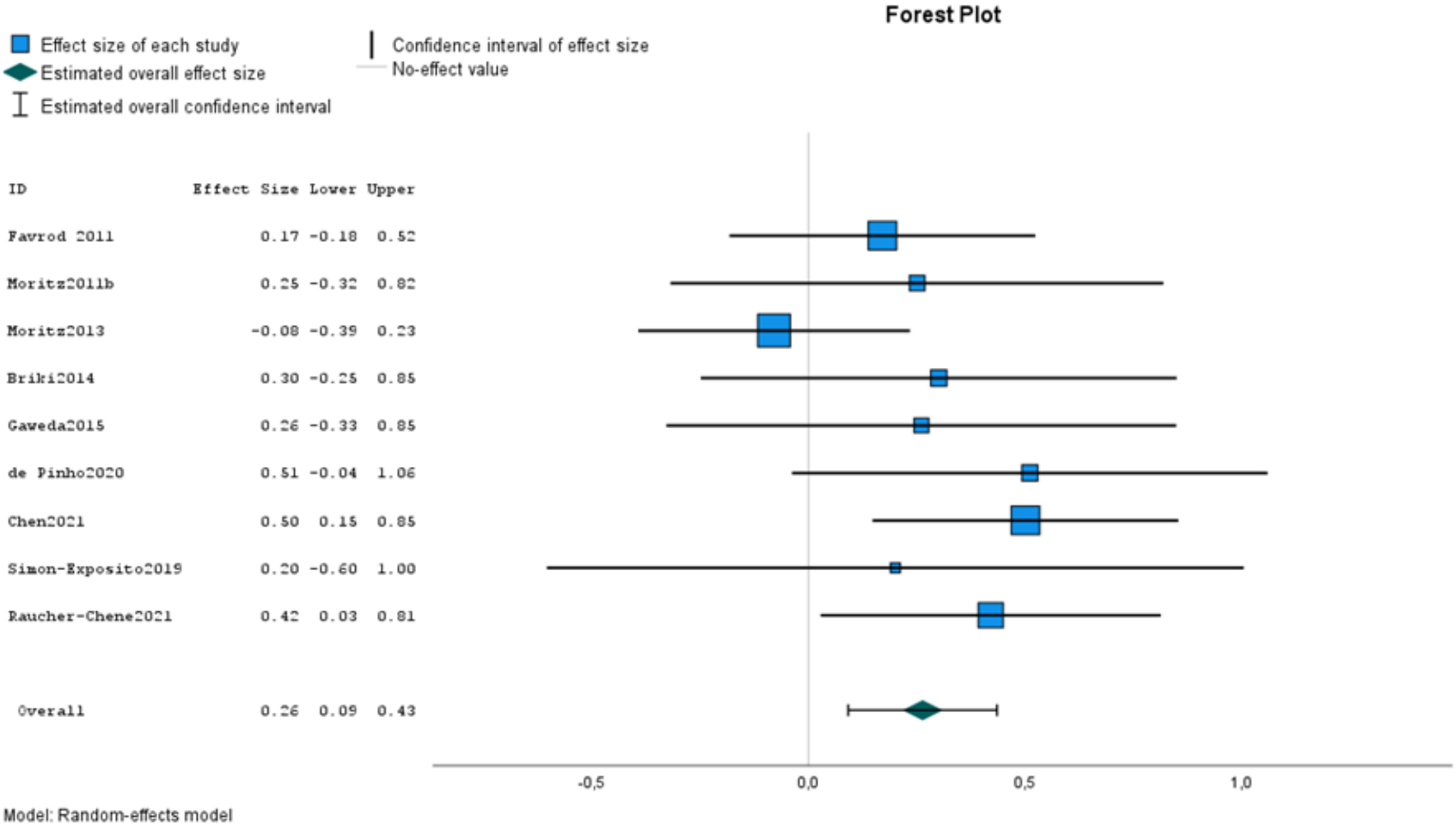
(b) Positive symptoms



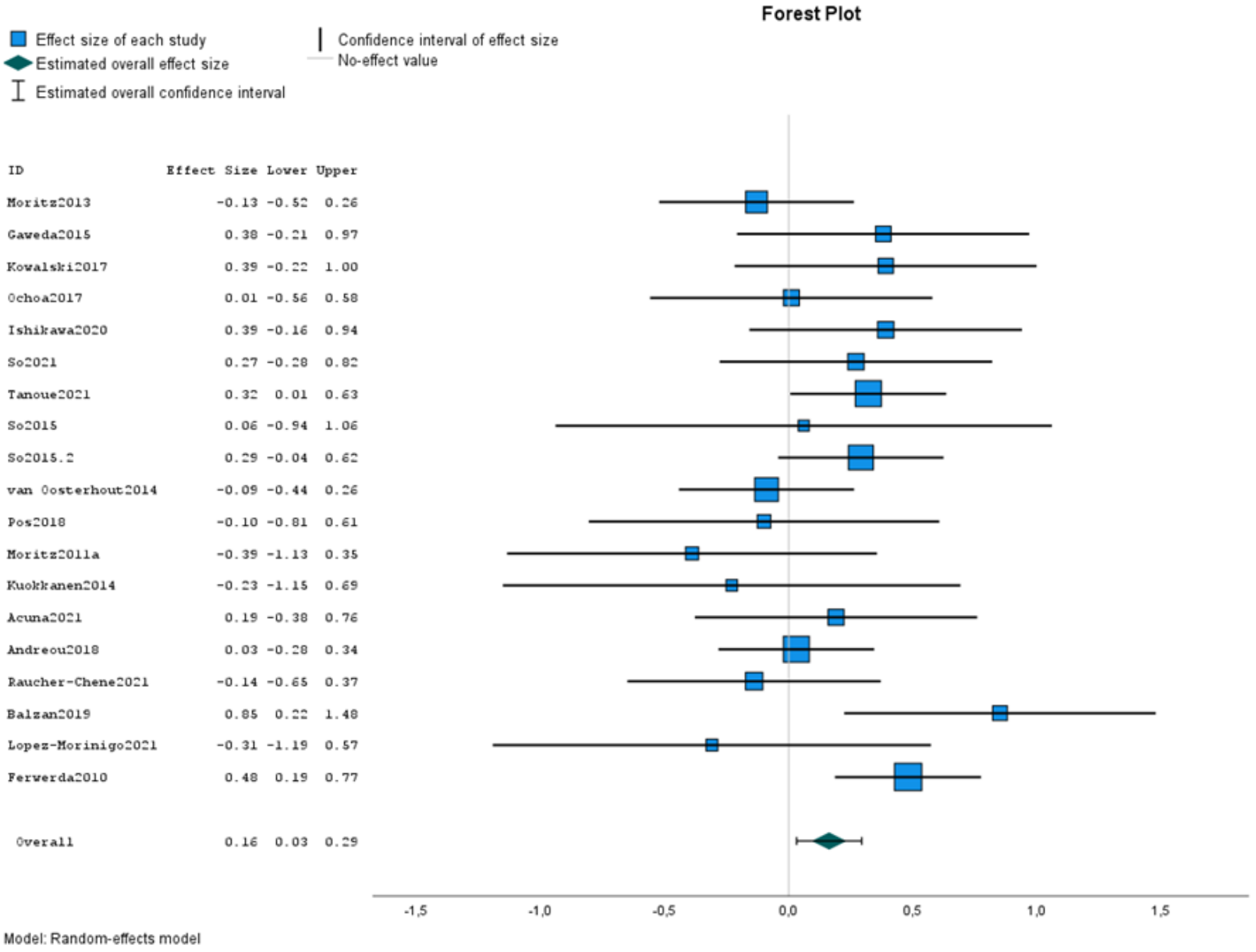
(c) Delusions



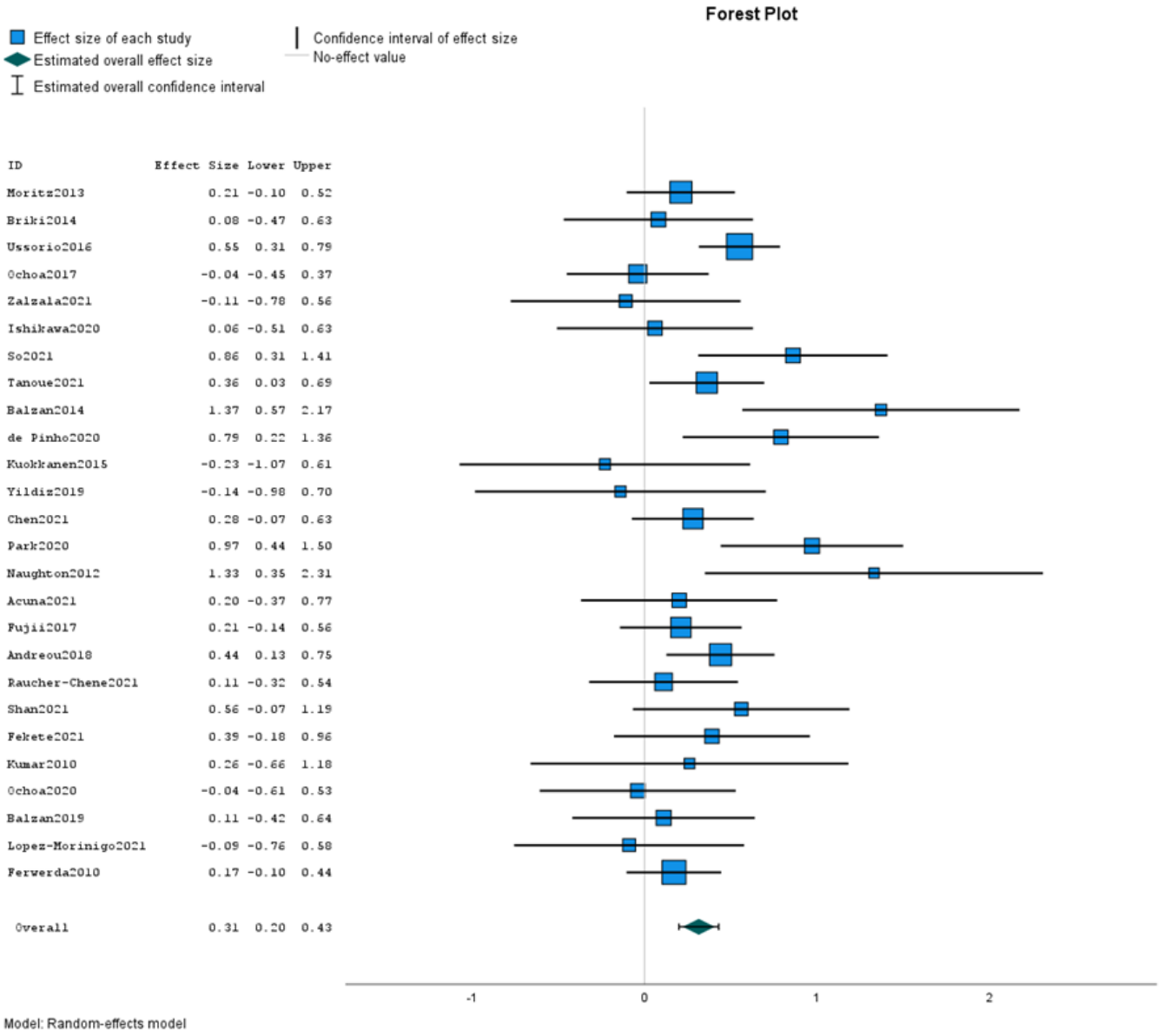
(d) Hallucinations



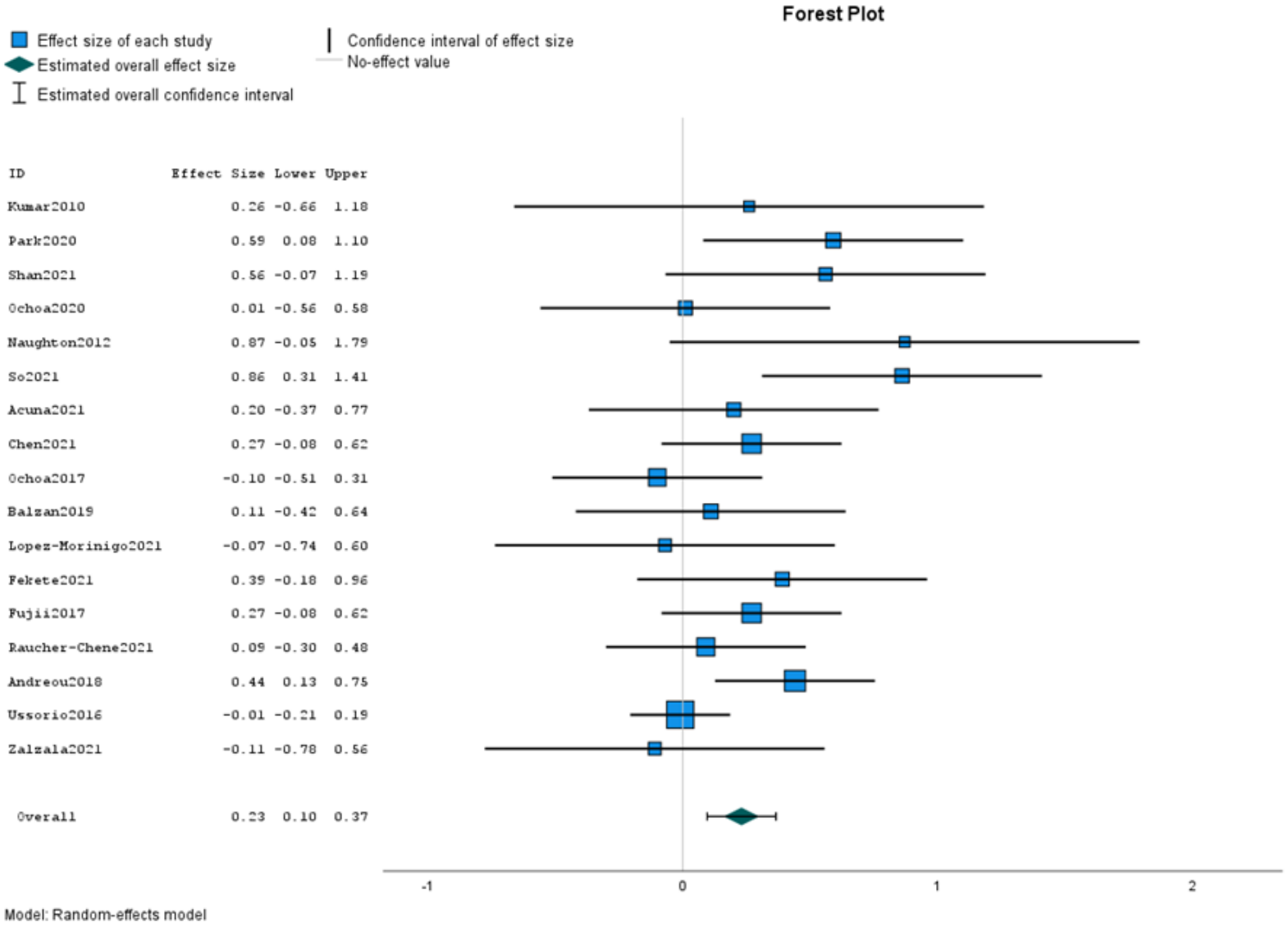
(e) Cognitive bias



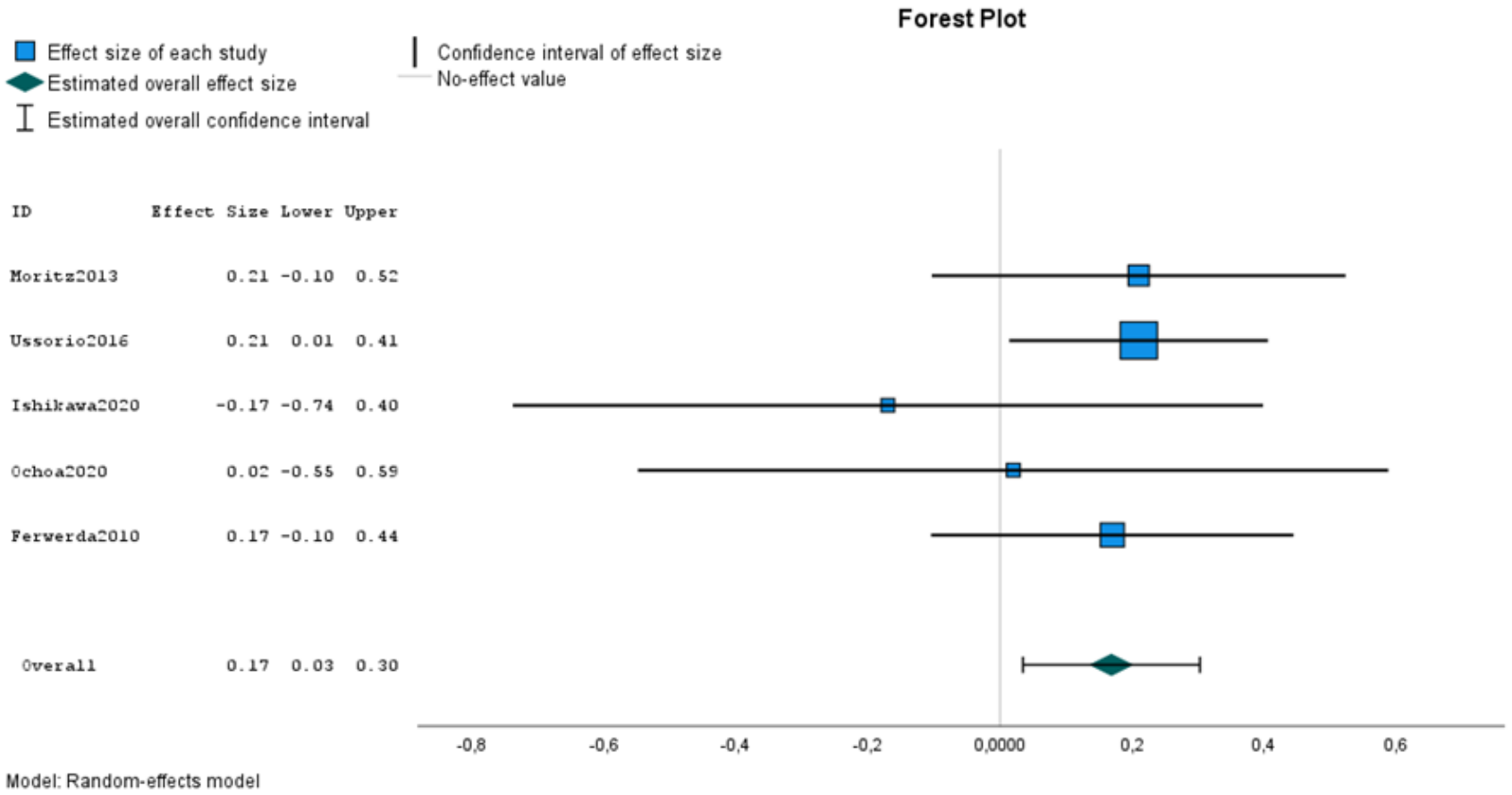
(f) Distal outcomes



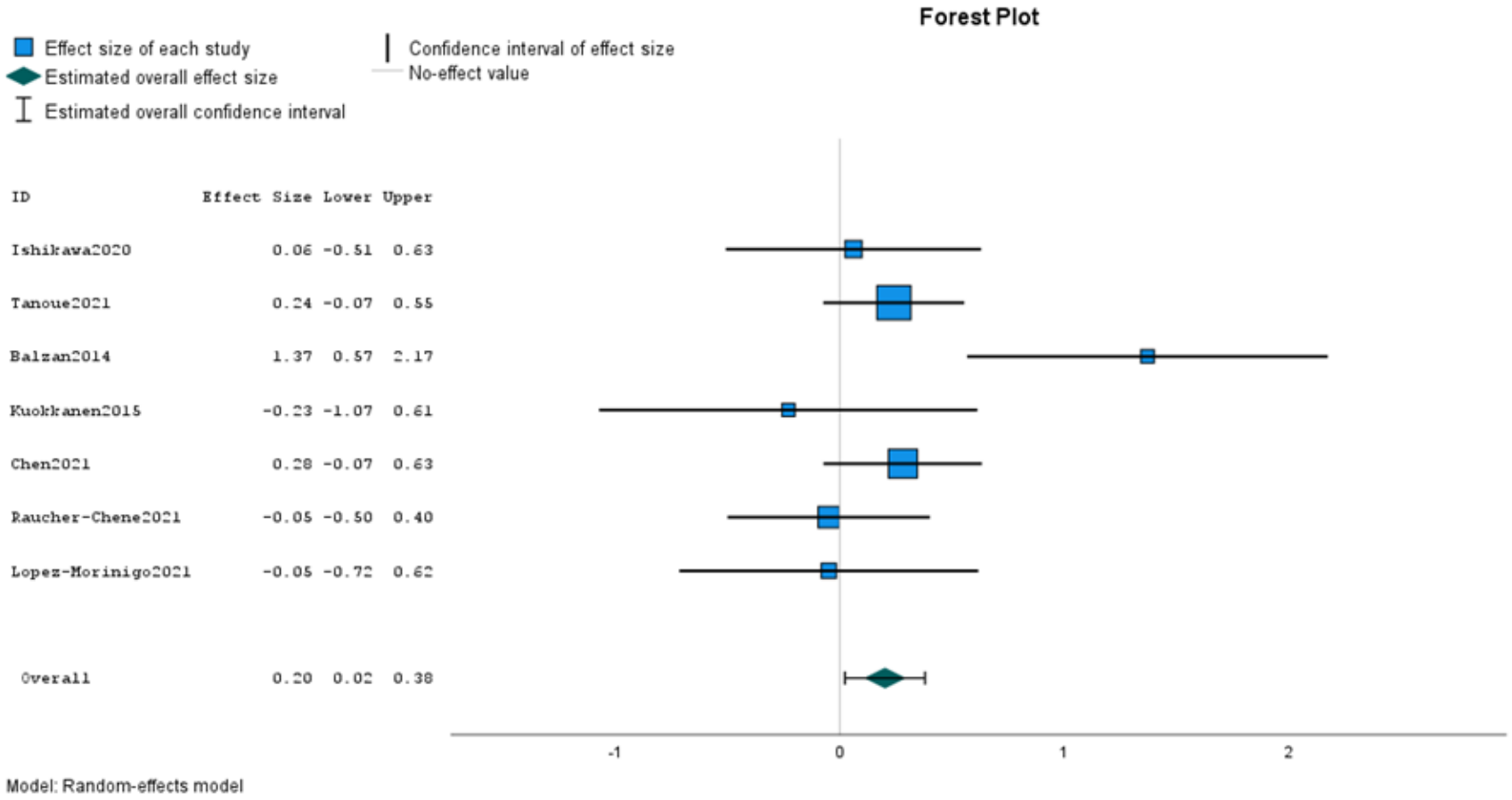
(g) Negative symptoms



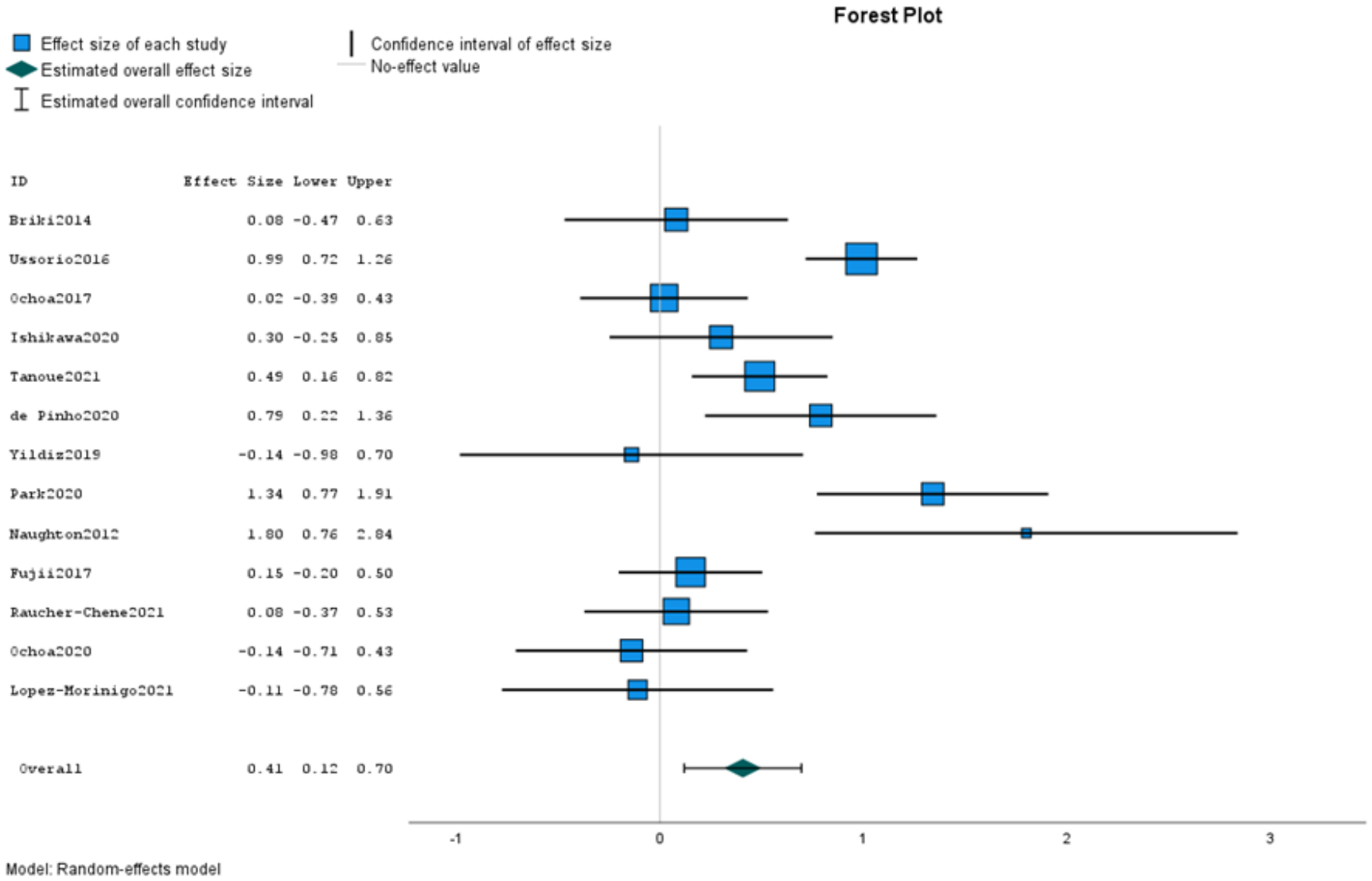
(h) Self-esteem



(i) Quality of life



(j) Functioning



eTable 7. List of excluded studies and ongoing trials.

First Author	Year/ Trial #	Title	Reason for Exclusion/ Link to protocol
Aggarwal	CTRI/2018/ 02/011838	Metacognitive therapy in schizophrenia	http://ctri.nic.in/Clinicaltrials/pmaindet2.php ?trialid=11094&EncHid=&userName=CTRI /2018/02/011838 ; principal author emailed no response
Ahuir	2018	Improvement in cognitive biases after group psychoeducation and metacognitive training in recent-onset psychosis: a randomized crossover clinical trial	Mixed intervention; MCT+ Psychoeducation in Group A; Group B psychoeducation + MCT
Akrap	2013	Metacognitive training for patients with schizophrenia (MCT): a Croatian pilot study of its efficacy	Conference abstract; author emailed no response
Alvarez-Astorga	2019	Social cognition in psychosis: Predictors and effects of META-cognitive training	Do not report + or - sx in the results, but did assess at baseline; senior author emailed no data provided
Andreou	NCT04631 939	Metacognitive Training as a Serious Game	Ongoing trial; https://clinicaltrials.gov/ct2/show/NCT0463 1939
Blumenfeld	Unknown	A longitudinal case-series study of the efficacy of metacognitive training at ameliorating psychosis-related symptoms and cognitive biases	Dissertation; Supervisor (Blumenfeld) emailed no response
Birulés	2020	Cognitive insight in first-episode psychosis: Changes during metacognitive training	Did not assess outcomes of interest
Buonocore	2015	Combined neurocognitive and metacognitive rehabilitation in schizophrenia: effects on bias against disconfirmatory evidence	Mixed intervention; used a combination of MCT and computer-assisted cognitive remediation
Caponnetto	2018	Improving neurocognitive functioning in schizophrenia by addition of cognitive remediation therapy to a standard treatment of metacognitive training	Mixed intervention; used a combination of MCT and cognitive remediation
Choi	2014	Case-management models for early psychosis intervention in Asia	Conference abstract; author emailed no response
Chong	2016	Metacognitive Training in Early Psychosis in Singapore: Preliminary Findings and Considerations	Conference abstract; author email not retrievable

First Author	Year/ Trial #	Title	Reason for Exclusion/ Link to protocol
Dobie	NCT03955549	Insight Enhancement Program vs. Metacognitive Training for Psychosis in Patients With Schizophrenia: a Three-Armed Comparative Randomized Controlled Trial	Ongoing trial; https://clinicaltrials.gov/ct2/show/NCT03955549
Fekete	2021	Basic demographic outcomes: additional findings of a single-blind, randomised, controlled trial on metacognitive training for psychosis	Received complete trial (unpublished) data from study author assessing more relevant outcomes
Howe	2015	Investigating the usefulness of a metacognitive training group programme for schizophrenia	Did not assess outcomes of interest
Kikuchi	N/A	Pilot trial of Metacognitive Training	UMIN000014554; principal author emailed no response
Kim	2014	Group cognitive behavioral therapy for Korean patients with early psychosis	Mixed intervention; used a combination of MCT with cognitive restructuring and lifestyle management
Lam	2015	Metacognitive training (MCT) for schizophrenia improves cognitive insight: a randomized controlled trial in a Chinese sample with schizophrenia spectrum disorders	Did not assess outcomes of interest
Lambert	NCT02037581	Integrated Care Including Assertive Community Treatment in Early Psychosis	MCT is a part of an Integrated Care package; https://clinicaltrials.gov/ct2/show/record/NCT02037581?view=record
Lecardeur	2009	Effects of cognitive remediation therapies on psychotic symptoms and cognitive complaints in patients with schizophrenia and related disorders: A randomized study	Mixed intervention; MCT modules were integrated in the mental state attribution therapy (MSAT)
Kowalski	2014	Open therapeutic ward for young patients with psychotic disorders – Description and patients evaluation of therapeutic program	Did not assess outcomes of interest
Köther	2017	Bayesian analyses of the effect of metacognitive training on social cognition deficits and overconfidence in errors.	Did not assess outcomes of interest
Matsumoto	JPRN-UMIN000029146 2017	Feasibility study of Meta Cognitive Training for At-Risk Mental State in Japan	Cancelled trial; https://upload.umin.ac.jp/cgi-open-bin/ctr_e/ctr_view.cgi?recptno=R000033325

First Author	Year/ Trial #	Title	Reason for Exclusion/ Link to protocol
Orcel	2013	Group metacognitive training for adolescents with psychosis: Multiple case study.	Conference abstract; author emailed no response
Puskar	2016	A Case Study on Promoting Neuroplasticity in a Patient With Schizophrenia	Did not assess outcomes of interest
Ravishankar	CTRI/2019/02/017658	To study the effectiveness of psychological therapy in patients with schizophrenia	Ongoing trial; http://ctri.nic.in/Clinicaltrials/pmaindet2.php?trialid=29718&EncHid=&userName=CTRI/2019/02/017658
Rek-Owodzin	2019	The effectiveness of metacognitive training for psychosis (MCT) in the ultra-high risk group (UHR)	Conference abstract; study discontinued
Rocha	2013	Metacognitive and social cognition training (MSCT) in schizophrenia: a preliminary efficacy study.	Mixed intervention; used a combination of metacognitive and social cognition training
Ross	2010	A Randomized Experimental Investigation of Reasoning Training for People With Delusions	Consists of a single session using two tasks from MCT and another exercise made by the authors
Schneider	DRKS00008001	Investigating the efficacy of an individualized metacognitive therapy program (MCT plus) for psychosis: study protocol of a multi-center randomized controlled trial	Ongoing trial publication
Turner	2019	The Effect of Reducing the "Jumping to Conclusions" Bias on Treatment Decision-Making Capacity in Psychosis: a Randomized Controlled Trial With Mediation Analysis	Mixed intervention; one-session intervention based on MCT: "MCT-JTC"
Vitzthum	2014	Individualized Metacognitive Therapy Program for Patients with Psychosis (MCT+): Introduction of a Novel Approach for Psychotic Symptoms	Mixed intervention; patient completed MCT (group) and MCT+ concurrently
Woodward	NCT01764568 2012	Contrasting Group Therapy Methods for Psychosis	Ongoing trial; https://clinicaltrials.gov/ct2/show/study/NCT01764568
Zonp	2021	The effectiveness of metacognitive training on impairments in social cognition in patients with schizophrenia: mental health nursing practice in a community mental health center	Did not assess outcomes of interest

eTable 8. Effect sizes of maintenance effectiveness by outcome.

Comparison	Outcome	Nb studies	Nb participants	Estimate (*g*)	Lower 95% CI	Upper 95% CI	*p*-value
Post-FUP<1y	Proximal	14	832	0.03	-0.09	0.14	0.66
Post-FUP<1y	Positive sx	14	832	0.08	-0.03	0.19	0.17
Post-FUP<1y	Delusions	10	654	0.05	-0.12	0.22	0.60
Post-FUP<1y	Hallucinations	2	202	-0.08	-0.56	0.40	0.74
Post-FUP<1y	Cognitive bias	10	658	0.06	-0.12	0.24	0.51
Post-FUP<1y	Distal	11	631	-0.01	-0.15	0.14	0.94
Post-FUP<1y	Negative sx	6	342	0.01	-0.20	0.22	0.95
Post-FUP<1y	Self-esteem	3	269	-0.14	-0.38	0.10	0.26
Post-FUP<1y	Quality of life	4	159	0.15	-0.08	0.38	0.19
Post-FUP<1y	Functioning	4	205	0.16	-0.06	0.37	0.15
Post-FUP>1y	Proximal	3	328	0.08	-0.17	0.33	0.55
Post-FUP>1y	Positive sx	2	178	0.13	-0.16	0.42	0.39
Post-FUP>1y	Delusions	1	76	0.03	-0.29	0.34	0.87
Post-FUP>1y	Hallucinations	1	74	0.05	-0.26	0.37	0.74
Post-FUP>1y	Cognitive bias	3	328	-0.04	-0.29	0.21	0.74
Post-FUP>1y	Distal	1	28	0.10	-0.62	0.82	0.79
Post-FUP>1y	Negative sx	1	28	0.20	-0.52	0.93	0.58
Post-FUP>1y	Self-esteem	0	0	0	0	0	0
Post-FUP>1y	Quality of life	1	28	0.12	-0.60	0.84	0.75
Post-FUP>1y	Functioning	1	28	0.03	-0.69	0.75	0.93
Pre-FUP<1y	Proximal	14	832	0.39	0.16	0.61	0.00
Pre-FUP<1y	Positive sx	14	832	0.49	0.22	0.76	0.00
Pre-FUP<1y	Delusions	10	654	0.61	0.16	1.06	0.01
Pre-FUP<1y	Hallucinations	2	202	0.07	-0.21	0.34	0.62
Pre-FUP<1y	Cognitive bias	10	658	0.20	-0.02	0.41	0.07
Pre-FUP<1y	Distal	11	631	0.30	0.14	0.46	0.00
Pre-FUP<1y	Negative sx	6	342	0.27	0.05	0.50	0.02
Pre-FUP<1y	Self-esteem	3	269	0.04	-0.44	0.52	0.86
Pre-FUP<1y	Quality of life	4	159	0.15	-0.23	0.52	0.44
Pre-FUP<1y	Functioning	4	205	0.53	0.30	0.75	0.00

Note. POST-FUP>1y = comparison of the follow-up (less than 1 year) to the post-intervention scores; Post-FUP<1y = comparison of the follow-up (more than 1 year) to the post-intervention scores; Pre-FUP<1y = comparison of the follow-up (less than 1 year) to the pre-intervention scores; *g* = Hedges' g; CI = Confidence intervals; sx = symptoms.

eTable 9. Moderator and subgroup analyses of study, participant, and treatment characteristics on proximal and distal outcomes for the pre-post timepoints comparison.

Moderator	Proximal						Distal					
	Nb studies	Statistic Type	Statistic Value	Lower 95% CI	Upper 95% CI	*p*-value	Nb studies	Statistic Type	Statistic Value	Lower 95% CI	Upper 95% CI	*p*-value
Study characteristics												
Publication year	38	β	0.00	-0.04	0.03	0.85	26	β	0.00	-0.04	0.03	0.91
MMAT assessment [a]												
1 (lowest quality)	2	*g*	0.43	0.03	0.82	0.03	2	*g*	0.13	-0.12	0.38	0.29
2	10	*g*	0.41	0.25	0.57	0.00	6	*g*	0.45	0.17	0.72	0.00
3	6	*g*	0.18	-0.11	0.47	0.23	5	*g*	0.03	-0.20	0.26	0.80
4	11	*g*	0.47	0.12	0.83	0.01	7	*g*	0.31	0.13	0.50	0.00
5 (highest quality)	9	*g*	0.48	0.15	0.81	0.00	6	*g*	0.52	0.19	0.85	0.00
Subgroup differences		Q_4	2.57			0.63		Q_4	9.33			0.05
Type of analysis												
N/R	11	*g*	0.28	0.11	0.44	0.00	0	*g*	0.00	0.00	0.00	0.00
Intention-to-treat	9	*g*	0.37	0.09	0.65	0.01	4	*g*	0.33	0.09	0.57	0.01
Per-protocol	18	*g*	0.53	0.30	0.76	0.00	15	*g*	0.33	0.16	0.50	0.00
Subgroup differences		Q_2	3.03			0.22		Q_2	0.12			0.94
Type of control condition												
Active	11	*g*	0.28	-0.02	0.58	0.06	8	*g*	0.11	-0.07	0.29	0.24
None	6	*g*	0.34	0.16	0.52	0.00	5	*g*	0.35	0.19	0.52	0.00
Other	2	*g*	0.45	0.16	0.75	0.00	2	*g*	0.59	-0.08	1.26	0.09
Passive	19	*g*	0.48	0.22	0.73	0.00	11	*g*	0.43	0.16	0.70	0.00
Subgroup differences		Q_3	1.08			0.78		Q_3	6.36			0.10
Type of design												
Non-randomized	11	*g*	0.46	0.18	0.75	0.00	7	*g*	0.46	0.23	0.68	0.00
Randomized controlled	26	*g*	0.37	0.20	0.53	0.00	19	*g*	0.25	0.11	0.39	0.00
Subgroup differences		Q_1	0.34			0.56		Q_1	2.27			0.13
Treatment characteristics												
Nb MCT sessions												
Less than 8	6	*g*	0.68	0.35	1.01	0.00	3	*g*	0.73	0.04	1.42	0.04
One cycle (8)	17	*g*	0.39	0.13	0.66	0.00	11	*g*	0.24	0.09	0.38	0.00
Two cycles (16)	6	*g*	0.22	0.06	0.37	0.01	5	*g*	0.41	0.14	0.69	0.00
More than 16	3	*g*	0.30	-0.05	0.64	0.09	2	*g*	0.46	-0.62	1.54	0.40
Other	6	*g*	0.37	0.17	0.57	0.00	0	*g*	0.00	0.00	0.00	0.00
Subgroup differences		Q_4	6.63			0.16		Q_4	3.58			0.47

Moderator	Proximal						Distal					
	Nb studies	Statistic Type	Statistic Value	Lower 95% CI	Upper 95% CI	*p*-value	Nb studies	Statistic Type	Statistic Value	Lower 95% CI	Upper 95% CI	*p*-value
Delivery format												
N/R	2	*g*	1.35	-0.48	3.19	0.15	1	*g*	0.97	0.43	1.50	0.00
Both	1	*g*	0.38	-0.18	0.94	0.19	0	*g*	0.00	0.00	0.00	0.00
Individual	5	*g*	0.79	0.40	1.18	0.00	3	*g*	0.43	-0.32	1.17	0.26
Group	30	*g*	0.29	0.17	0.41	0.00	22	*g*	0.29	0.18	0.41	0.00
Subgroup differences		Q_3	7.07			0.07		Q_3	5.86			0.05
Facilitators credentials												
N/R	10	*g*	0.45	0.29	0.61	0.00	0	*g*	0.00	0.00	0.00	0.00
GP	1	*g*	0.46	0.10	0.82	0.01	1	*g*	0.28	-0.08	0.63	0.13
Graduate student	1	*g*	0.31	-0.27	0.90	0.30	0	*g*	0.00	0.00	0.00	0.00
Nurse	5	*g*	0.78	0.18	1.38	0.01	2	*g*	0.51	0.11	0.91	0.01
Occupational therapist	2	*g*	0.42	0.11	0.73	0.01	2	*g*	0.17	-0.13	0.47	0.27
Psychiatrist	4	*g*	0.54	-0.03	1.11	0.06	4	*g*	0.43	-0.01	0.87	0.06
Psychologist	15	*g*	0.21	0.00	0.42	0.06	9	*g*	0.21	0.00	0.43	0.05
Subgroup differences		Q_6	5.83			0.44		Q_5	3.32			0.65
Training of facilitators												
No or N/R	16	*g*	0.50	0.29	0.71	0.00	10	*g*	0.43	0.21	0.66	0.00
Yes	22	*g*	0.31	0.13	0.49	0.00	16	*g*	0.25	0.11	0.40	0.00
Subgroup differences		Q_1	1.86			0.17		Q_1	1.72			0.19
Adherence to MCT manual												
No or N/R	14	*g*	0.50	0.26	0.75	0.00	9	*g*	0.48	0.21	0.75	0.00
Yes	24	*g*	0.33	0.17	0.49	0.00	17	*g*	0.25	0.12	0.39	0.00
Subgroup differences		Q_1	1.30			0.25		Q_1	2.15			0.14
Participant characteristics												
Age (years)	36	β	0.00	-0.07	0.02	0.84	25	β	0.01	-0.01	0.02	0.39
Duration of illness (years)	20	β	0.01	-0.01	0.02	0.44	17	β	0.01	-0.01	0.03	0.31
Sex (%male)	36	β	-0.01	-0.02	0.00	0.18	26	β	0.00	-0.01	0.01	0.82
Medication (chlorpromazine equivalents)	17	β	0.00	0.00	0.00	0.91	12	β	0.00	0.00	0.00	0.68
Diagnosis (%SSD)	35	β	0.01	-0.01	0.02	0.35	24	β	-0.02	-0.04	0.00	0.11

Note. a = Number of "yes"; β = Beta coefficient for metaregression; *g* = Hedges' g; GP = general practitioner; MMAT = Mixed methods appraisal tool; N/R = not reported; Q = Q-statistic for between-group comparison; SSD = Schizophrenia-spectrum disorders; gender (i.e., including non-binary, other, etc. categories) was not included as a moderator as it was not assessed by any study.

eTable 10. Moderator and subgroup analyses of study, participant, and treatment characteristics on separate outcomes for the pre-post timepoints comparison.

Moderator	Positive symptoms[b]						Delusions[b]					
	Nb studies	Statistic Type	Statistic Value	Lower 95% CI	Upper 95% CI	*p*-value	Nb studies	Statistic Type	Statistic Value	Lower 95% CI	Upper 95% CI	*p*-value
Study characteristics												
Publication year	36	β	-0.01	-0.06	0.03	0.62	23	β	-0.02	-0.09	0.05	0.64
MMAT assessment [a]												
1 (lowest quality)	2	*g*	0.44	0.01	0.86	0.05	2	*g*	0.37	-0.22	0.97	0.22
2	9	*g*	0.62	0.28	0.96	0.00	5	*g*	0.96	0.20	1.71	0.01
3	6	*g*	0.22	-0.16	0.61	0.25	2	*g*	0.58	-0.21	1.38	0.15
4	11	*g*	0.53	0.15	0.91	0.01	8	*g*	0.72	0.26	1.18	0.00
5 (highest quality)	8	*g*	0.58	0.24	0.91	0.00	6	*g*	0.63	0.34	0.93	0.00
Subgroup differences		Q_4	2.73			0.60		Q_4	1.57			0.81
Type of analysis												
N/R	10	*g*	0.33	0.16	0.49	0.00	6	*g*	0.45	0.24	0.66	0.00
Intention-to-treat	8	*g*	0.66	0.23	1.09	0.00	7	*g*	0.83	0.23	1.43	0.01
Per-protocol	18	*g*	0.58	0.33	0.83	0.00	10	*g*	0.80	0.44	1.15	0.00
Subgroup differences		Q_2	3.98			0.14		Q_2	3.50			0.17
Type of control condition												
Active	11	*g*	0.30	0.00	0.61	0.05	6	*g*	0.48	0.14	0.82	0.01
None	6	*g*	0.47	0.24	0.70	0.00	4	*g*	0.66	0.34	0.98	0.00
Other	1	*g*	0.43	-0.08	0.94	0.10	0	*g*	0	0	0	0
Passive	18	*g*	0.65	0.34	0.96	0.00	13	*g*	0.81	0.36	1.27	0.00
Subgroup differences		Q_3	2.44			0.49		Q_3	1.39			0.50
Type of design												
Non-randomized	10	*g*	0.61	0.29	0.93	0.00	7	*g*	0.90	0.51	1.29	0.00
Randomized controlled	24	*g*	0.47	0.25	0.69	0.00	15	*g*	0.64	0.32	0.96	0.00
Subgroup differences		Q_1	0.48			0.49		Q_1	1.03			0.31
Treatment characteristics												
Nb MCT sessions												
Less than 8	6	*g*	0.97	0.42	1.52	0.00	6	*g*	1.14	0.50	1.77	0.00
One cycle (8)	15	*g*	0.48	0.18	0.78	0.00	10	*g*	0.63	0.27	0.98	0.00
Two cycles (16)	6	*g*	0.22	0.06	0.37	0.01	2	*g*	0.38	-0.08	0.84	0.10
More than 16	3	*g*	0.30	-0.05	0.64	0.09	1	*g*	0.42	-0.14	0.99	0.14
Other	6	*g*	0.48	0.28	0.68	0.00	4	*g*	0.45	0.00	0.89	0.05
Subgroup differences		Q_4	10.03			0.04		Q_4	4.41			0.35

Moderator	Positive symptoms[b]						Delusions[b]					
	Nb studies	Statistic Type	Statistic Value	Lower 95% CI	Upper 95% CI	*p*-value	Nb studies	Statistic Type	Statistic Value	Lower 95% CI	Upper 95% CI	*p*-value
Delivery format												
N/R	2	*g*	1.35	-0.48	3.19	0.15	1	*g*	2.30	1.61	3.00	0.00
Both	1	*g*	0.38	-0.18	0.94	0.19	1	*g*	0.42	-0.14	0.99	0.14
Group	28	*g*	0.35	0.21	0.50	0.00	16	*g*	0.46	0.27	0.66	0.00
Individual	5	*g*	1.13	0.57	1.68	0.00	5	*g*	1.25	0.51	1.99	0.00
Subgroup differences		Q_3	7.90			0.05		Q_3	28.26			0.00
Facilitators credentials												
N/R	10	*g*	0.50	0.28	0.72	0.00	5	*g*	0.64	0.36	0.92	0.00
GP	1	*g*	0.46	0.10	0.82	0.01	1	*g*	0.43	0.07	0.79	0.02
Graduate student	1	*g*	0.23	-0.36	0.81	0.44	1	*g*	0.22	-0.37	0.80	0.47
Nurse	4	*g*	1.00	0.35	1.64	0.00	3	*g*	1.45	0.72	2.18	0.00
Occupational therapist	2	*g*	0.43	0.12	0.74	0.01	1	*g*	0.55	0.00	1.11	0.05
Psychiatrist	4	*g*	0.68	0.07	1.28	0.03	1	*g*	0.39	-0.17	0.94	0.17
Psychologist	14	*g*	0.37	0.08	0.66	0.01	11	*g*	0.64	0.21	1.06	0.00
Subgroup differences		Q_6	4.27			0.64		Q_5	8.29			0.22
Training of facilitators												
No or N/R	15	*g*	0.62	0.40	0.84	0.00	9	*g*	0.81	0.49	1.12	0.00
Yes	21	*g*	0.41	0.19	0.64	0.00	14	*g*	0.61	0.27	0.96	0.00
Subgroup differences		Q_1	1.61			0.20		Q_1	0.64			0.42
Adherence to MCT manual												
No or N/R	14	*g*	0.55	0.29	0.81	0.00	8	*g*	0.80	0.42	1.19	0.00
Yes	22	*g*	0.48	0.26	0.69	0.00	15	*g*	0.63	0.31	0.94	0.00
Subgroup differences		Q_1	0.17			0.68		Q_1	0.47			0.49
Participant characteristics												
Age (years)	34	β	-0.01	-0.04	0.01	0.26	22	β	-0.02	-0.05	0.02	0.44
Duration of illness (years)	19	β	0.00	-0.01	0.02	0.74	11	β	0.00	-0.03	0.04	0.85
Sex (%male)	34	β	-0.01	-0.02	0.00	0.20	21	β	-0.01	-0.03	0.01	0.22
Medication (chlorpromazine equivalents)	17	β	0.00	0.00	0.00	0.74	11	β	0.00	0.00	0.00	0.37
Diagnosis (%SSD)	32	β	-0.01	-0.02	0.01	0.34	21	β	-0.01	-0.03	0.01	0.19

Note. a = Number of "yes"; b = Results must be interpreted cautiously due to the low number of studies per subgroup for some analyses; β = Beta coefficient for metaregression; *g* = Hedges' g; GP = general practitioner N/R = not reported; Q = Q-statistic for between-group comparison; SSD = Schizophrenia-spectrum disorder; gender (i.e., including non-binary, other, etc. categories) was not included as a moderator as it was not assessed by any study.

Moderator	Hallucinations[b]						Cognitive bias[b]					
	Nb studies	Statistic Type	Statistic Value	Lower 95% CI	Upper 95% CI	*p*-value	Nb studies	Statistic Type	Statistic Value	Lower 95% CI	Upper 95% CI	*p*-value
Study characteristics												
Publication year	9	β	0.04	0.00	0.07	0.03	19	β	0.00	-0.03	0.04	0.88
MMAT assessment [a]												
1 (lowest quality)	0	*g*	0.00	0.00	0.00	0.00	1	*g*	0.48	0.19	0.77	0.00
2	1	*g*	0.30	-0.25	0.85	0.28	6	*g*	0.27	0.08	0.46	0.00
3	2	*g*	0.28	0.02	0.54	0.04	4	*g*	-0.03	-0.33	0.27	0.84
4	3	*g*	0.22	-0.18	0.61	0.28	5	*g*	0.13	-0.16	0.41	0.38
5 (highest quality)	3	*g*	0.35	0.00	0.70	0.05	3	*g*	-0.01	-0.53	0.51	0.98
Subgroup differences		Q_3	0.24			0.97		Q_4	7.25			0.12
Type of analysis												
N/R	2	*g*	0.24	-0.24	0.71	0.33	5	*g*	0.24	-0.07	0.55	0.14
Intention-to-treat	3	*g*	0.17	-0.19	0.53	0.36	7	*g*	0.13	-0.04	0.30	0.13
Per-protocol	4	*g*	0.35	0.15	0.55	0.00	7	*g*	0.14	-0.10	0.38	0.27
Subgroup differences		Q_2	0.82			0.66		Q_2	0.34			0.84
Type of control condition												
Active	4	*g*	0.23	-0.07	0.53	0.14	6	*g*	0.13	-0.20	0.45	0.45
None	2	*g*	0.28	0.02	0.54	0.04	4	*g*	0.21	-0.05	0.47	0.11
Other	0	*g*	0	0	0	0	0	*g*	0	0	0	0
Passive	3	*g*	0.35	0.00	0.71	0.05	9	*g*	0.14	-0.03	0.31	0.10
Subgroup differences		Q_2	0.29			0.86		Q_2	0.24			0.89
Type of design												
Non-randomized	2	*g*	0.18	-0.14	0.50	0.27	5	*g*	0.19	0.00	0.43	0.14
Randomized controlled	6	*g*	0.26	0.00	0.48	0.00	14	*g*	0.15	0.00	0.31	0.00
Subgroup differences		Q_1	0.18			0.67		Q_1	0.00			0.84
Treatment characteristics												
Nb MCT sessions												
Less than 8	0	*g*	0	0	0	0	5	*g*	0.36	0.13	0.59	0.00
One cycle (8)	4	*g*	0.27	-0.05	0.60	0.10	10	*g*	0.04	-0.15	0.23	0.65
Two cycles (16)	2	*g*	0.27	-0.19	0.72	0.25	0	*g*	0	0	0	0
More than 16	1	*g*	0.25	-0.31	0.80	0.39	0	*g*	0	0	0	0
Other	2	*g*	0.28	0.02	0.54	0.04	4	*g*	0.22	0.00	0.45	0.05
Subgroup differences		Q_3	0.01			1.00		Q_4	4.54			0.10
Delivery format												
N/R	0	*g*	0	0	0	0	0	*g*	0	0	0	0
Both	1	*g*	0.25	-0.31	0.80	0.39	0	*g*	0	0	0	0
Individual	8	*g*	0.26	0.10	0.42	0.00	16	*g*	0.13	-0.01	0.26	0.06
Group	0	*g*	0	0	0	0	3	*g*	0.42	0.03	0.80	0.04

Moderator	Hallucinations[b]						Cognitive bias[b]					
	Nb studies	Statistic Type	Statistic Value	Lower 95% CI	Upper 95% CI	*p*-value	Nb studies	Statistic Type	Statistic Value	Lower 95% CI	Upper 95% CI	*p*-value
Subgroup differences		Q_1	0.00			0.96		Q_1	1.92			0.17
Facilitators credentials												
N/R	0	*g*	0.00	0.00	0.00	0.00	3	*g*	0.29	-0.03	0.61	0.08
GP	1	*g*	0.50	0.14	0.87	0.01	0	*g*	0	0	0	0
Graduate student	1	*g*	0.26	-0.33	0.84	0.39	1	*g*	0.38	-0.21	0.97	0.20
Nurse	2	*g*	0.28	-0.03	0.58	0.07	2	*g*	0.23	-0.11	0.57	0.19
Occupational therapist	1	*g*	0.30	-0.25	0.85	0.28	1	*g*	0.39	-0.17	0.94	0.17
Psychiatrist	0	*g*	0	0	0	0	1	*g*	0.19	-0.38	0.76	0.51
Psychologist	4	*g*	0.16	-0.10	0.42	0.23	11	*g*	0.05	-0.14	0.24	0.60
Subgroup differences		Q_4	2.29			0.68		Q_5	3.31			0.65
Training of facilitators												
No or N/R	2	*g*	0.19	-0.10	0.49	0.19	6	*g*	0.22	-0.01	0.45	0.06
Yes	6	*g*	0.26	0.03	0.49	0.03	13	*g*	0.13	-0.03	0.29	0.11
Subgroup differences		Q_1	0.26			0.61		Q_1	0.37			0.54
Adherence to MCT manual												
No or N/R	2	*g*	0.19	-0.10	0.49	0.19	3	*g*	0.20	-0.01	0.42	0.06
Yes	7	*g*	0.29	0.09	0.48	0.00	16	*g*	0.14	-0.01	0.30	0.07
Subgroup differences		Q_1	0.26			0.61		Q_1	0.19			0.67
Participant characteristics												
Age (years)	9	β	0.01	-0.01	0.03	0.20	18	β	0.01	-0.01	0.03	0.25
Duration of illness (years)	6	β	0.00	-0.02	0.03	0.77	8	β	0.01	-0.01	0.04	0.31
Sex (%male)	8	β	-0.02	-0.03	0.00	0.08	18	β	-0.01	-0.02	0.00	0.23
Medication (chlorpromazine equivalents)	0	β	0	0	0	0	13	β	0.00	0.00	0.00	1.00
Diagnosis (%SSD)	9	β	0	-0.03	0.02	0.79	18	β	0.00	-0.01	0.01	0.59

Note. a = Number of "yes"; b = Results must be interpreted cautiously because of the low number of studies per subgroup for some analyses; β = Beta coefficient for metaregression; *g* = Hedges' g; GP = general practitioner N/R = not reported; Q = Q-statistic for between-group comparison; SSD = Schizophrenia-Spectrum Disorder; gender (i.e., including non-binary, other, etc. categories) was not included as a moderator as it was not assessed by any study.

Moderator	Negative symptoms[b]						Self-esteem[b]					
	Nb studies	Statistic Type	Statistic Value	Lower 95% CI	Upper 95% CI	*p*-value	Nb studies	Statistic Type	Statistic Value	Lower 95% CI	Upper 95% CI	*p*-value
Study characteristics												
Publication year	17	β	0.01	-0.04	0.07	0.59	5	β	-0.01	-0.06	0.03	0.52
MMAT assessment [a]												
1 (lowest quality)	1	*g*	0.01	-0.56	0.59	0.96	2	*g*	0.14	-0.11	0.39	0.26
2	4	*g*	0.48	0.20	0.77	0.00	0	*g*	0	0	0	0
3	5	*g*	0.01	-0.21	0.23	0.92	0	*g*	0	0	0	0
4	5	*g*	0.36	0.16	0.55	0.00	1	*g*	0.21	-0.11	0.53	0.19
5 (highest quality)	2	*g*	0.20	-0.34	0.73	0.47	2	*g*	0.12	-0.20	0.44	0.46
Subgroup differences		Q_4	8.85			0.06		Q_4	0.19			0.91
Type of analysis												
N/R	5	*g*	0.35	-0.01	0.71	0.06	2	*g*	0.14	-0.11	0.39	0.26
Intention-to-treat	0	*g*	0	0	0	0	2	*g*	0.10	-0.25	0.44	0.57
Per-protocol	12	*g*	0.19	0.05	0.32	0.01	1	*g*	0.21	0.01	0.41	0.04
Subgroup differences		Q_2	0.68			0.41		Q_2	0.36			0.83
Type of control condition												
Active	6	*g*	0.12	-0.08	0.32	0.24	1	*g*	0.21	-0.11	0.53	0.19
None	3	*g*	0.16	-0.12	0.44	0.27	2	*g*	0.20	0.04	0.36	0.02
Other	1	*g*	0.59	0.07	1.10	0.03	0	*g*	0	0	0	0
Passive	7	*g*	0.37	0.15	0.59	0.00	2	*g*	-0.08	-0.48	0.33	0.71
Subgroup differences		Q_3	4.65			0.20		Q_2	1.61			0.45
Type of design												
Non-randomized	3	*g*	0.30	-0.13	0.73	0.17	2	*g*	0.20	0.00	0.36	0.00
Randomized controlled	13	*g*	0.25	0.00	0.40	0.00	3	*g*	0.10	-0.15	0.35	0.42
Subgroup differences		Q_1	0.00			0.82		Q_1	0.39			0.53
Treatment characteristics												
Nb MCT sessions												
Less than 8	2	*g*	0.49	-0.25	1.22	0.19	0	*g*	0	0	0	0
One cycle (8)	7	*g*	0.22	0.02	0.41	0.03	2	*g*	0.19	-0.02	0.40	0.07
Two cycles (16)	4	*g*	0.22	-0.07	0.50	0.14	1	*g*	0.21	0.01	0.41	0.04
More than 16	1	*g*	0.59	0.07	1.10	0.03	0	*g*	0	0	0	0
Other	3	*g*	0.10	-0.18	0.38	0.50	2	*g*	-0.08	-0.48	0.33	0.71
Subgroup differences		Q_4	3.21			0.52		Q_2	1.62			0.45
Delivery format												
N/R	1	*g*	0.59	0.07	1.10	0.03	0	*g*	0	0	0	0
Both	0	*g*	0	0	0	0	0	*g*	0	0	0	0
Individual	14	*g*	0.23	0.08	0.38	0.00	4	*g*	0.18	0.04	0.32	0.01
Group	2	*g*	0.07	-0.32	0.46	0.73	1	*g*	0.02	-0.56	0.59	0.96

Moderator	Negative symptoms[b]						Self-esteem[b]					
	Nb studies	Statistic Type	Statistic Value	Lower 95% CI	Upper 95% CI	*p*-value	Nb studies	Statistic Type	Statistic Value	Lower 95% CI	Upper 95% CI	*p*-value
Subgroup differences		Q_3	2.51			0.28		Q_1	0.29			0.59
Facilitators credentials												
N/R	5	*g*	0.39	0.17	0.61	0.00	1	*g*	0.17	-0.10	0.45	0.22
GP	1	*g*	0.27	-0.09	0.62	0.14	0	*g*	0	0	0	0
Graduate student	0	*g*	0	0	0	0	0	*g*	0	0	0	0
Nurse	0	*g*	0	0	0	0	0	*g*	0	0	0	0
Occupational therapist	1	*g*	0.27	-0.09	0.63	0.14	1	*g*	-0.17	-0.75	0.40	0.56
Psychiatrist	3	*g*	0.46	0.07	0.84	0.02	0	*g*	0	0	0	0
Psychologist	7	*g*	0.10	-0.11	0.30	0.35	3	*g*	0.20	0.03	0.36	0.02
Subgroup differences		Q_6	4.72			0.32		Q_5	1.44			0.49
Training of facilitators												
No or N/R	8	*g*	0.39	0.22	0.56	0.00	1	*g*	0.17	-0.10	0.45	0.22
Yes	9	*g*	0.08	-0.05	0.21	0.23	4	*g*	0.17	0.01	0.33	0.03
Subgroup differences		Q_1	8.17			0.00		Q_1	0.00			0.98
Adherence to MCT manual												
No or N/R	6	*g*	0.37	0.18	0.57	0.00	0	*g*	0	0	0	0
Yes	11	*g*	0.16	0.01	0.32	0.04	5	*g*	0.17	0.03	0.31	0.01
Subgroup differences		Q_1	2.67			0.10		Q_1	0.00			1.00
Participant characteristics												
Age (years)	16	β	0.01	-0.01	0.02	0.34	4	β	-0.01	-0.05	0.03	0.67
Duration of illness (years)	11	β	0.01	0.00	0.02	0.16	0	β	0	0	0	0
Sex (%male)	17	β	0.00	-0.01	0.01	0.53	5	β	0.01	-0.01	0.02	0.59
Medication (chlorpromazine equivalents)	9	β	0.00	0.00	0.00	0.73	0	β	0	0	0	0
Diagnosis (%SSD)	15	β	-0.01	-0.02	0.00	0.13	0	β	0	0	0	0

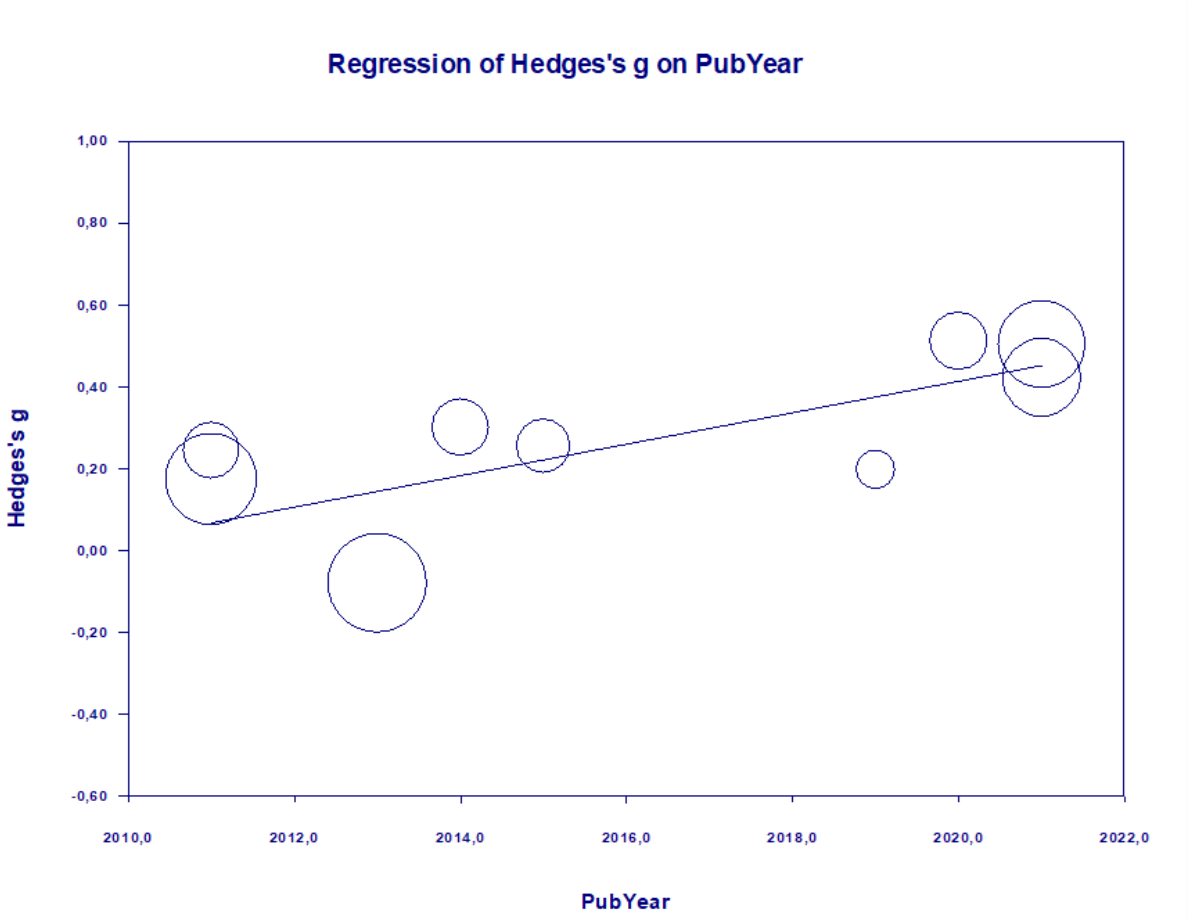
Note. a = Number of "yes"; b = Results must be interpreted cautiously because of the low number of studies per subgroup for some analyses; β = Beta coefficient for metaregression; *g* = Hedges' g; GP = general practitioner N/R = not reported; Q = Q-statistic for between-group comparison; SSD = Schizophrenia-spectrum disorder; gender (i.e., including non-binary, other, etc. categories) was not included as a moderator as it was not assessed by any study.

Moderator	Quality of life[b]						Functioning[b]					
	Nb studies	Statistic Type	Statistic Value	Lower 95% CI	Upper 95% CI	*p*-value	Nb studies	Statistic Type	Statistic Value	Lower 95% CI	Upper 95% CI	*p*-value
Study characteristics												
Publication year	7	β	-0.08	-0.19	0.03	0.15	13	β	-0.07	-0.18	0.03	0.17
MMAT assessment[a]												
1 (lowest quality)	0	*g*	0.00	0.00	0.00	0.00	1	*g*	-0.14	-0.72	0.43	0.62
2	1	*g*	0.24	-0.08	0.56	0.14	4	*g*	0.49	0.02	0.97	0.04
3	2	*g*	-0.05	-0.42	0.33	0.80	3	*g*	0.02	-0.26	0.29	0.91
4	1	*g*	0.28	-0.08	0.64	0.13	2	*g*	0.80	-1.10	2.71	0.41
5 (highest quality)	3	*g*	0.39	-0.51	1.29	0.40	3	*g*	0.74	0.33	1.15	0.00
Subgroup differences		Q_3	2.06			0.56		Q_4	11.43			0.02
Type of analysis												
N/R	0	*g*	0.00	0.00	0.00	0.00	4	*g*	0.30	-0.32	0.92	0.34
Intention-to-treat	2	*g*	0.20	-0.08	0.48	0.16	3	*g*	0.51	0.26	0.76	0.00
Per-protocol	5	*g*	0.23	-0.20	0.66	0.29	6	*g*	0.41	-0.08	0.90	0.10
Subgroup differences		Q_1	0.02			0.90		Q_2	0.43			0.81
Type of control condition												
Active	2	*g*	0.20	-0.11	0.52	0.20	4	*g*	-0.01	-0.29	0.27	0.96
None	2	*g*	0.14	-0.12	0.41	0.29	3	*g*	0.54	0.04	1.05	0.04
Other	0	*g*	0.00	0.00	0.00	0.00	1	*g*	1.34	0.78	1.90	0.00
Passive	3	*g*	0.39	-0.51	1.29	0.40	5	*g*	0.45	-0.02	0.92	0.06
Subgroup differences		Q_2	0.30			0.86		Q_3	19.13			0.00
Type of design												
Non-randomized	3	*g*	0.42	-0.19	1.02	0.17	4	*g*	0.72	0.20	1.23	0.00
Randomized controlled	4	*g*	0.13	-0.13	0.39	0.32	9	*g*	0.26	-0.05	0.57	0.00
Subgroup differences		Q_1	0.72			0.40		Q_1	2.18			0.14
Treatment characteristics												
Nb MCT sessions												
Less than 8	1	*g*	1.37	0.56	2.17	0.00	0	*g*	0.00	0.00	0.00	0.00
One cycle (8)	3	*g*	0.15	-0.14	0.45	0.32	3	*g*	0.23	-0.30	0.76	0.39
Two cycles (16)	0	*g*	0.00	0.00	0.00	0.00	4	*g*	0.66	0.03	1.28	0.04
More than 16	0	*g*	0.00	0.00	0.00	0.00	2	*g*	0.64	-0.82	2.09	0.39
Other	3	*g*	0.13	-0.11	0.37	0.28	4	*g*	0.23	-0.04	0.51	0.10
Subgroup differences		Q_2	8.51			0.01		Q_4	1.74			0.63
Delivery format												
N/R	0	*g*	0.00	0.00	0.00	0.00	1	*g*	1.34	0.78	1.90	0.00
Both	0	*g*	0.00	0.00	0.00	0.00	0	*g*	0.00	0.00	0.00	0.00
Individual	6	*g*	0.14	-0.05	0.32	0.14	11	*g*	0.37	0.09	0.66	0.01
Group	1	*g*	1.37	0.56	2.17	0.00	1	*g*	-0.14	-0.72	0.43	0.62

Moderator	Quality of life[b]						Functioning[b]					
	Nb studies	Statistic Type	Statistic Value	Lower 95% CI	Upper 95% CI	*p*-value	Nb studies	Statistic Type	Statistic Value	Lower 95% CI	Upper 95% CI	*p*-value
Subgroup differences		Q_1	8.51			0.00		Q_2	14.19			0.00
Facilitators credentials												
N/R	1	*g*	1.37	0.56	2.17	0.00	2	*g*	0.64	-0.82	2.09	0.39
GP	1	*g*	0.28	-0.08	0.64	0.13	0	*g*	0.00	0.00	0.00	0.00
Graduate student	0	*g*	0.00	0.00	0.00	0.00	0	*g*	0.00	0.00	0.00	0.00
Nurse	1	*g*	0.24	-0.08	0.56	0.14	2	*g*	0.57	0.28	0.85	0.00
Occupational therapist	1	*g*	0.06	-0.51	0.64	0.83	2	*g*	0.19	-0.11	0.49	0.21
Psychiatrist	0	*g*	0.00	0.00	0.00	0.00	2	*g*	0.88	-0.80	2.56	0.30
Psychologist	3	*g*	-0.08	-0.42	0.26	0.65	5	*g*	0.20	-0.33	0.73	0.47
Subgroup differences		Q_4	11.09			0.03		Q_5	4.08			0.40
Training of facilitators												
No or N/R	1	*g*	1.37	0.56	2.17	0.00	2	*g*	0.72	-0.45	1.90	0.23
Yes	6	*g*	0.14	-0.05	0.32	0.14	11	*g*	0.35	0.05	0.65	0.02
Subgroup differences		Q_1	8.51			0.00		Q_1	0.36			0.55
Adherence to MCT manual												
No or N/R	3	*g*	0.48	0.01	0.95	0.04	4	*g*	0.83	0.14	1.53	0.02
Yes	4	*g*	-0.04	-0.34	0.25	0.78	9	*g*	0.26	-0.05	0.57	0.10
Subgroup differences		Q_1	3.45			0.06		Q_1	2.15			0.14
Participant characteristics												
Age (years)	7	β	0.00	-0.04	0.04	0.92	12	β	0.01	-0.02	0.04	0.45
Duration of illness (years)	6	β	0.01	-0.05	0.07	0.67	9	β	0.01	-0.02	0.04	0.49
Sex (%male)	7	β	0.00	-0.01	0.02	0.75	13	β	0.02	-0.01	0.04	0.14
Medication (chlorpromazine equivalents)	4	β	0.00	0.00	0.00	0.67	7	β	0.00	0.00	0.00	0.50
Diagnosis (%SSD)	7	β	0.01	-0.02	0.05	0.43	12	β	-0.02	-0.05	0.01	0.25

Note. a = Number of "yes"; b = Results must be interpreted cautiously because of the low number of studies per subgroup for some analyses; β = Beta coefficient for metaregression; *g* = Hedges' g; GP = general practitioner N/R = not reported; Q = Q-statistic for between-group comparison; SSD = Schizophrenia-spectrum disorders; gender (i.e., including non-binary, other, etc. categories) was not included as a moderator as it was not assessed by any study.

eFigure 2. Scatterplot of publication year significantly moderating effect sizes for hallucinations in pre-post comparison.



eTable 11. Heterogeneity assessment by outcome and timepoints comparison.

Comparison	Outcome	Nb studies	Nb participants	Q-value	*df*	*p*-value	I^2
Pre-Post	Proximal	38	1717	101.03	37	0.00	63.38
Pre-Post	Positive sx	36	1648	144.37	35	0.00	75.76
Pre-Post	Delusions	23	1156	121.13	22	0.00	81.84
Pre-Post	Hallucinations	9	518	7.84	8	0.45	0.00
Pre-Post	Cognitive bias	19	931	23.57	18	0.17	23.63
Pre-Post	Distal	26	1180	42.83	25	0.01	41.63
Pre-Post	Negative sx	17	765	22.77	16	0.12	29.72
Pre-Post	Self-esteem	5	325	1.86	4	0.76	0.00
Pre-Post	Quality of life	7	278	11.25	6	0.08	46.65
Pre-Post	Functioning	13	522	52.45	12	0.00	77.12
Post-FUP<1y	Proximal	14	832	10.03	13	0.69	0.00
Post-FUP<1y	Positive sx	14	832	11.01	13	0.61	0.00
Post-FUP<1y	Delusions	10	654	13.39	9	0.15	32.78
Post-FUP<1y	Hallucinations	2	202	2.42	1	0.12	58.60
Post-FUP<1y	Cognitive bias	10	658	14.59	9	0.10	38.33
Post-FUP<1y	Distal	11	631	5.89	10	0.82	0.00
Post-FUP<1y	Negative sx	6	342	1.83	5	0.87	0.00
Post-FUP<1y	Self-esteem	3	269	0.83	2	0.66	0.00
Post-FUP<1y	Quality of life	4	159	1.29	3	0.73	0.00
Post-FUP<1y	Functioning	4	205	2.51	3	0.47	0.00
Post-FUP>1y	Proximal	3	328	0.24	2	0.89	0.00
Post-FUP>1y	Positive sx	2	178	0.46	1	0.50	0.00
Post-FUP>1y	Delusions	1	76	0.00	0	1.00	0.00
Post-FUP>1y	Hallucinations	1	74	0.00	0	1.00	0.00
Post-FUP>1y	Cognitive bias	3	328	1.27	2	0.53	0.00
Post-FUP>1y	Distal	1	28	0.00	0	1.00	0.00
Post-FUP>1y	Negative sx	1	28	0.00	0	1.00	0.00
Post-FUP>1y	Self-esteem	0	0	0	0	0	0
Post-FUP>1y	Quality of life	1	28	0.00	0	1.00	0.00
Post-FUP>1y	Functioning	1	28	0.00	0	1.00	0.00
Pre-FUP<1y	Proximal	14	832	37.71	13	0.00	65.52
Pre-FUP<1y	Positive sx	14	832	57.93	13	0.00	77.56
Pre-FUP<1y	Delusions	10	654	80.50	9	0.00	88.82
Pre-FUP<1y	Hallucinations	2	202	0.02	1	0.88	0.00
Pre-FUP<1y	Cognitive bias	10	658	19.90	9	0.02	54.78
Pre-FUP<1y	Distal	11	631	11.41	10	0.33	12.34
Pre-FUP<1y	Negative sx	6	342	5.71	5	0.34	12.42
Pre-FUP<1y	Self-esteem	3	269	7.00	2	0.03	71.44
Pre-FUP<1y	Quality of life	4	159	6.43	3	0.09	53.32
Pre-FUP<1y	Functioning	4	205	3.05	3	0.38	1.78

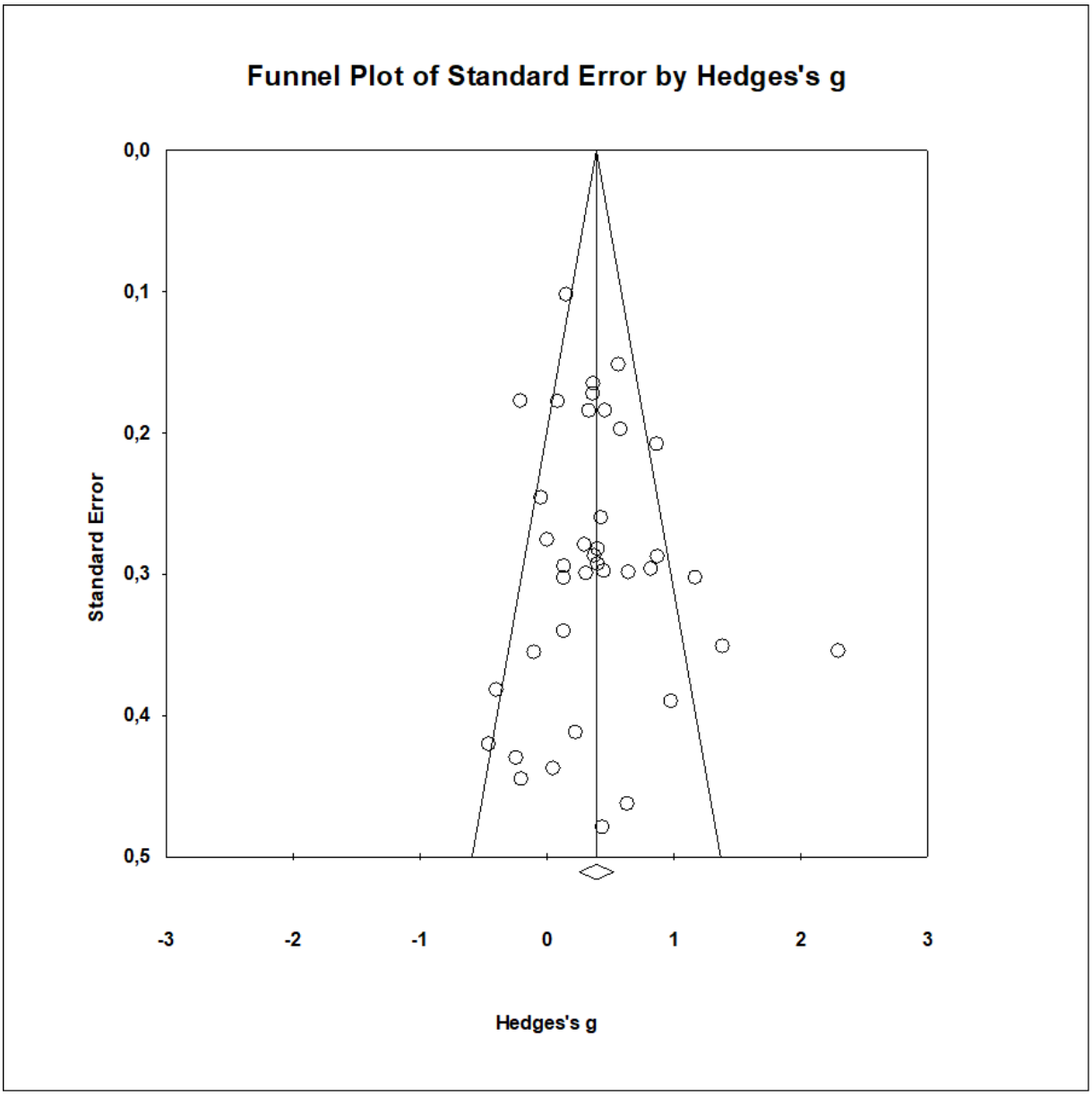
Note. POST-FUP<1y = Comparison of the follow-up (less than 1 year) to the post-intervention scores; Post-FUP<1y = Comparison of the follow-up (more than 1 year) to the post-intervention scores; Pre-FUP<1y = Comparison of the follow-up (less than 1 year) to the pre-intervention scores; g = Hedges' g; df = degrees of freedom; sx = symptoms.

eTable 12. Rosenthal's Fail-safe N and tests for asymmetry of funnel plots (Egger test) by outcome for the pre-post comparison.

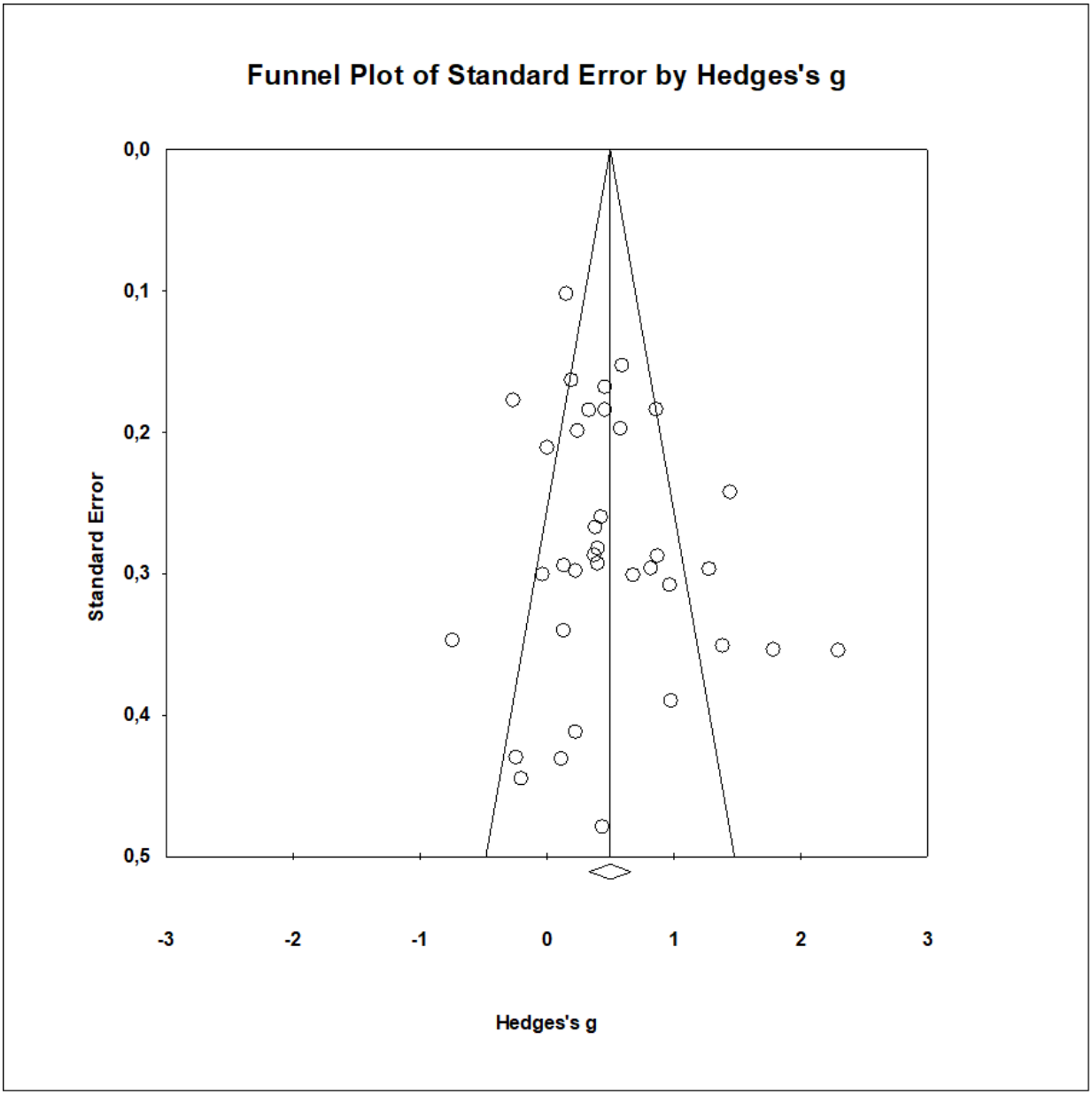
Outcome	Fail-safe N	Intercept	SE	Lower 95% CI	Upper 95% CI	*p*-value
Proximal	763	0.65	0.71	-0.79	2.09	0.36
Positive symptoms	1173	1.41	0.91	-0.43	3.25	0.13
Delusions	871	2.77	1.61	-0.58	6.11	0.10
Hallucinations	20	1.03	1.25	-1.93	3.98	0.44
Cognitive bias	14	-0.81	0.75	-2.39	0.78	0.30
Distal	275	0.04	0.72	-1.45	1.52	0.96
Negative symptoms	59	1.14	0.69	-0.33	2.61	0.12
Self-esteem	0	-1.41	0.47	-2.89	0.07	0.06
Quality of life	2	0.28	1.67	-4.02	4.57	0.88
Functioning	115	-1.00	1.82	-5.00	3.00	0.59

eFigure 3. Funnel plots for each outcome for the pre-post comparison.

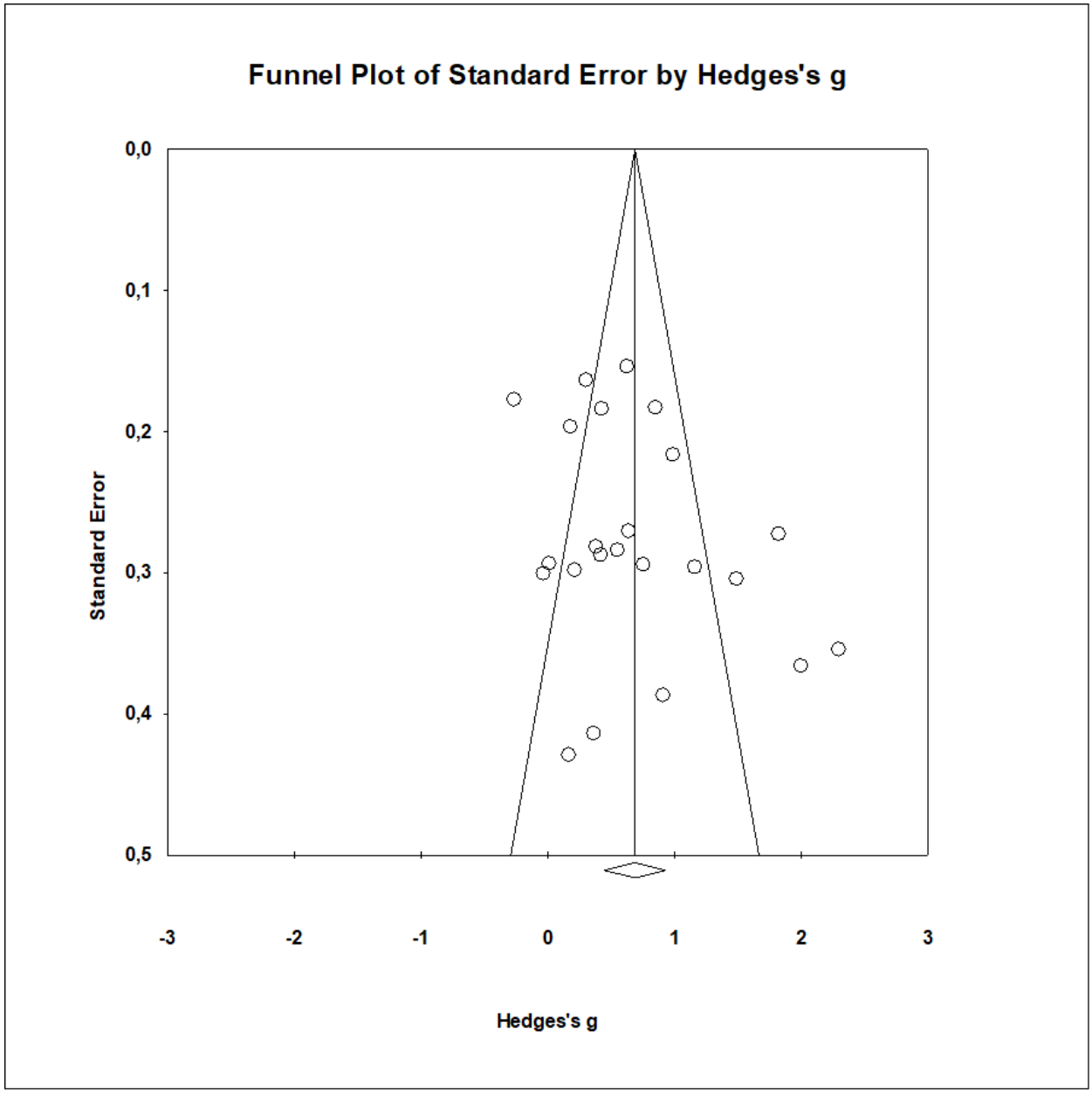
(a) Proximal outcomes



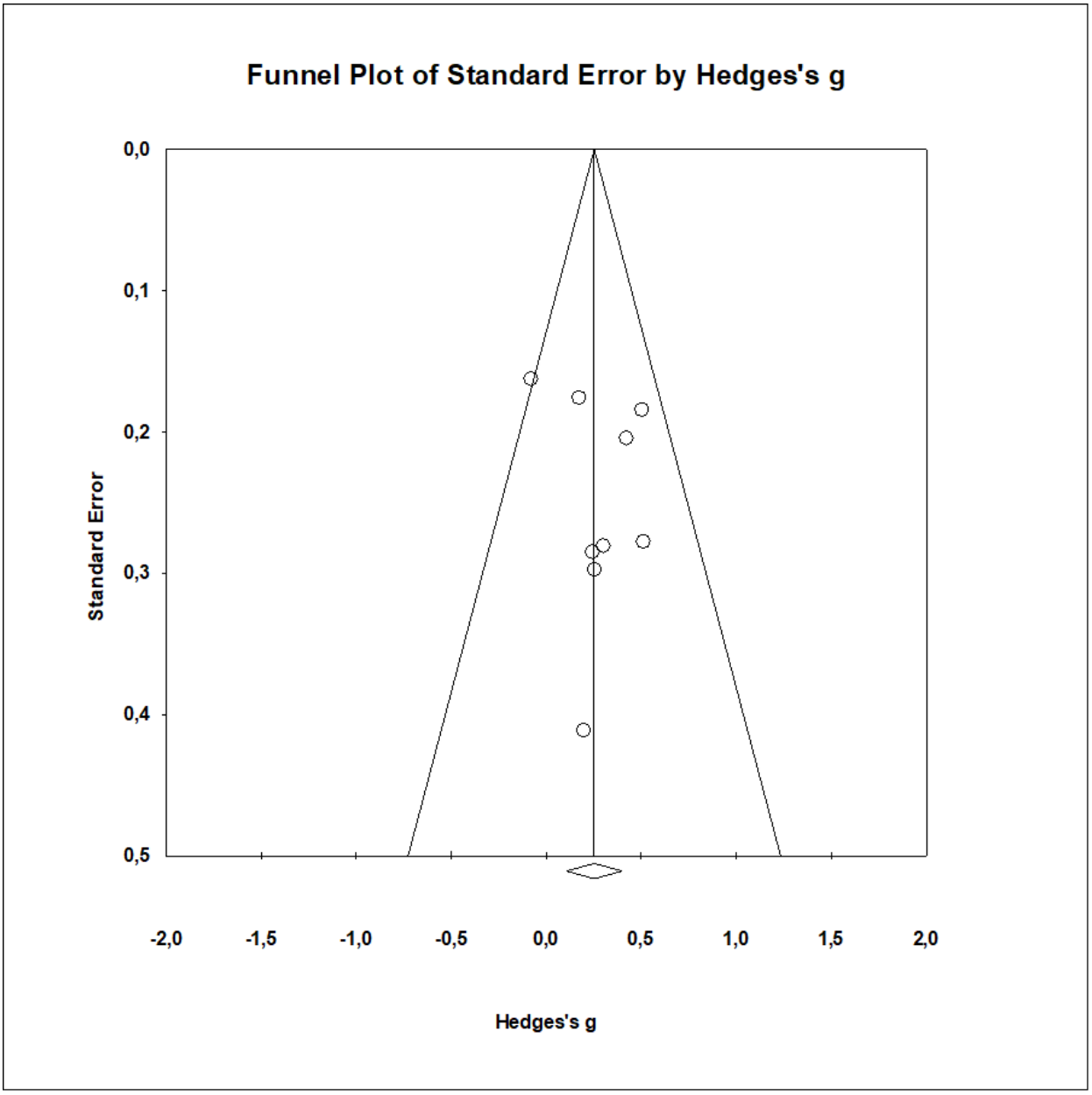
(b) Positive symptoms



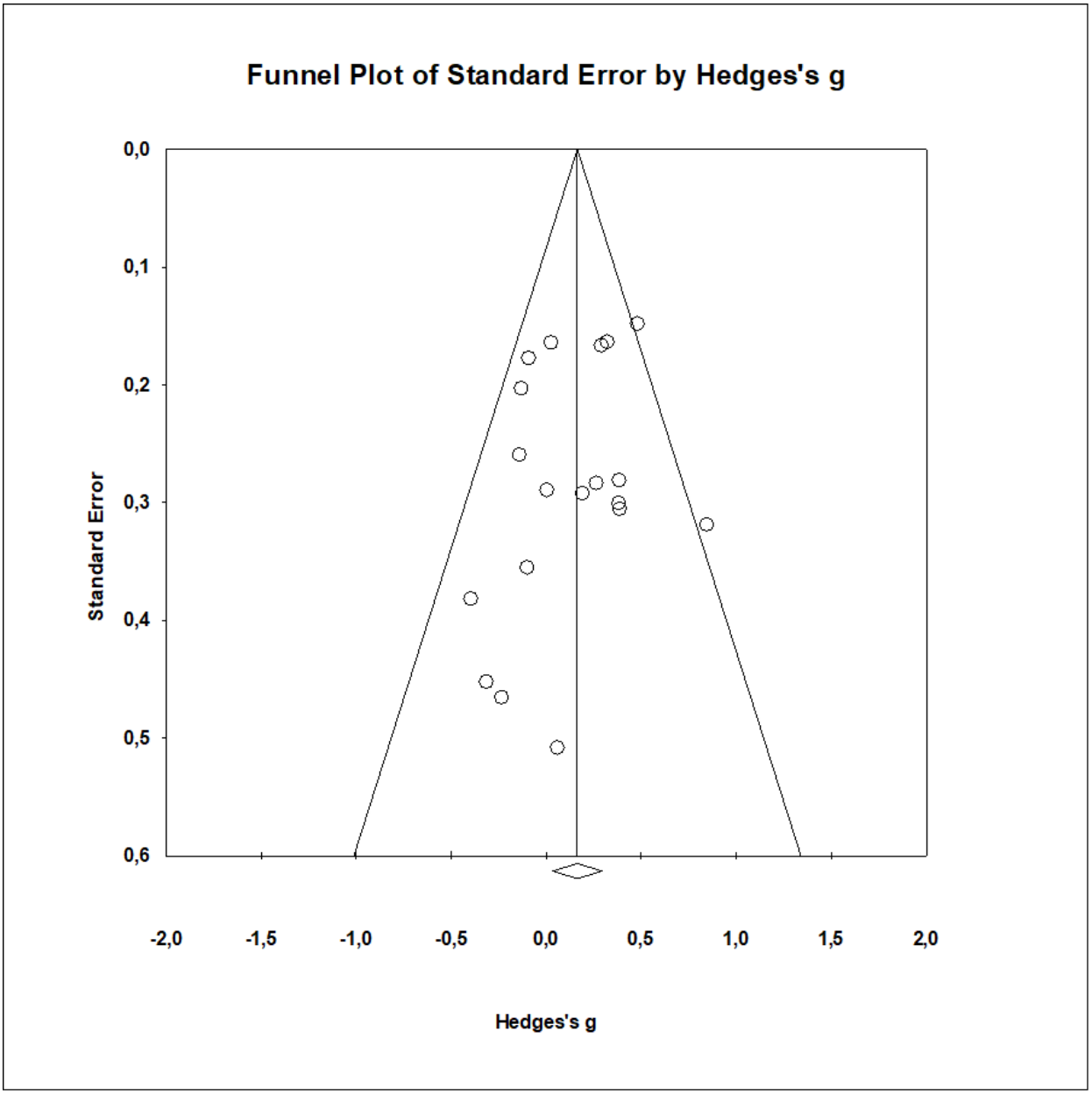
(c) Delusions


Funnel Plot of Standard Error by Hedges's g
Standard Error
0,0
0,1
0,2
0,3
0,4
0,5
-3
-2
-1
0
1
2
3
Hedges's g

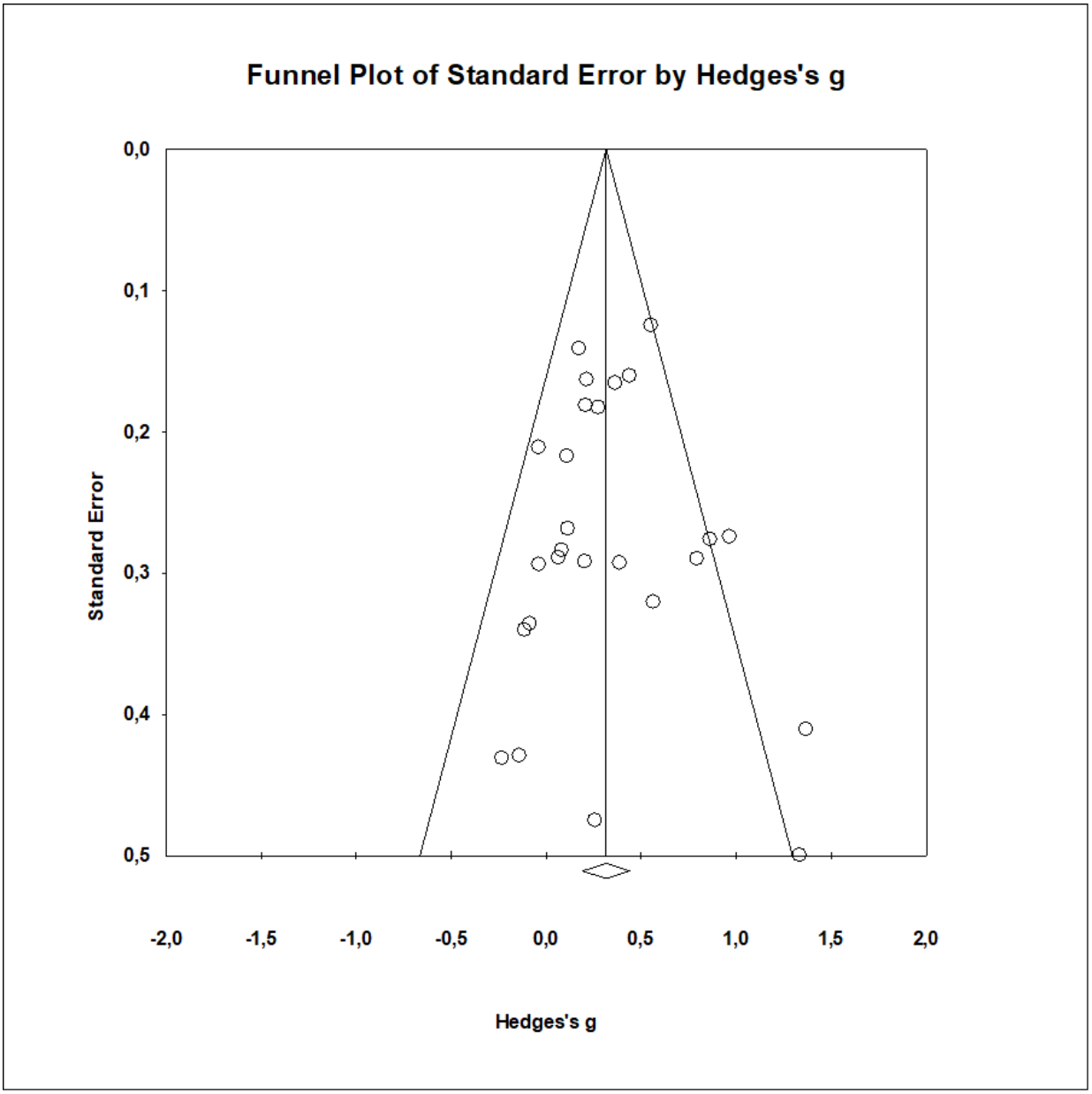
(d) Hallucinations



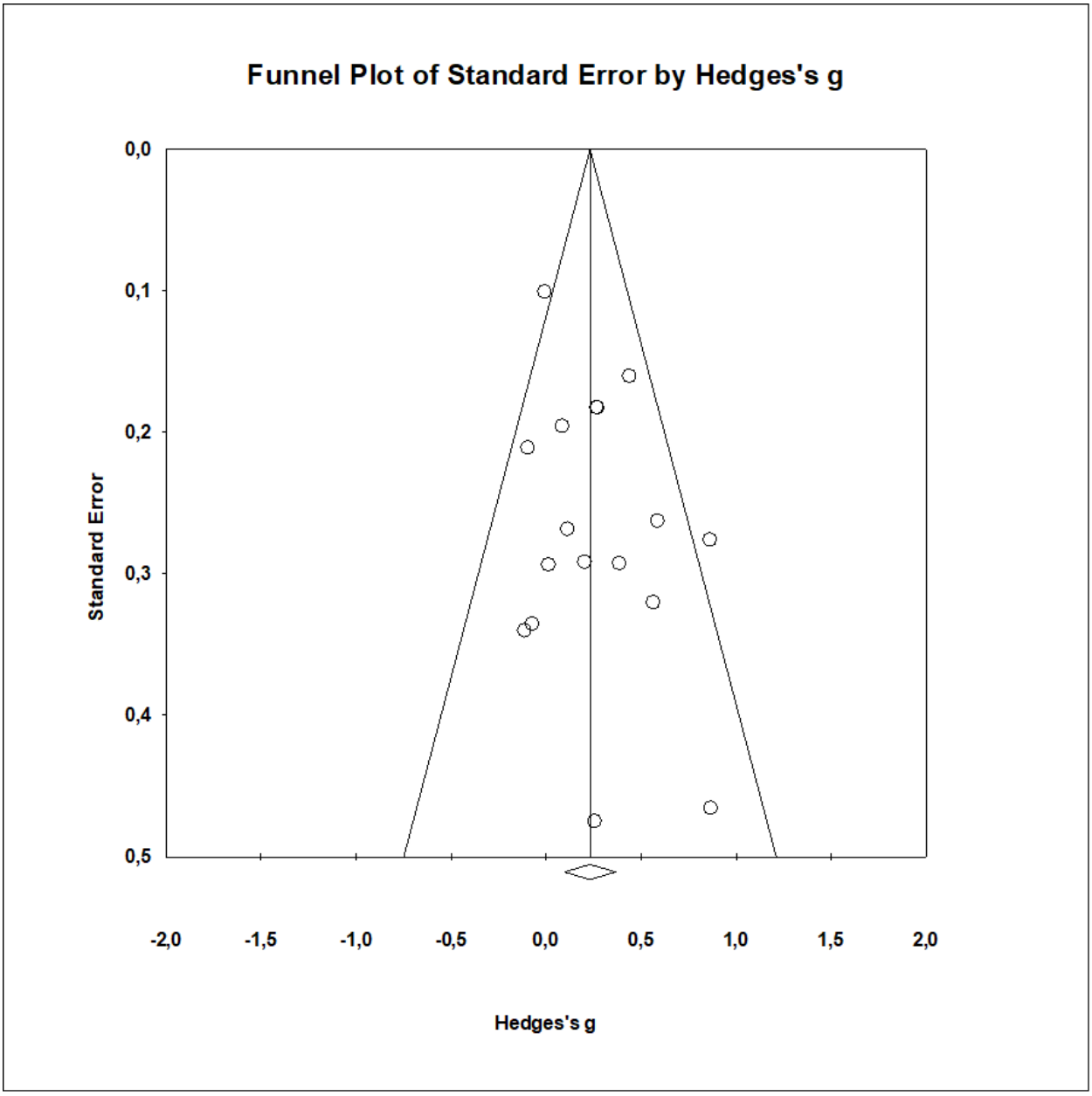
(e) Cognitive bias



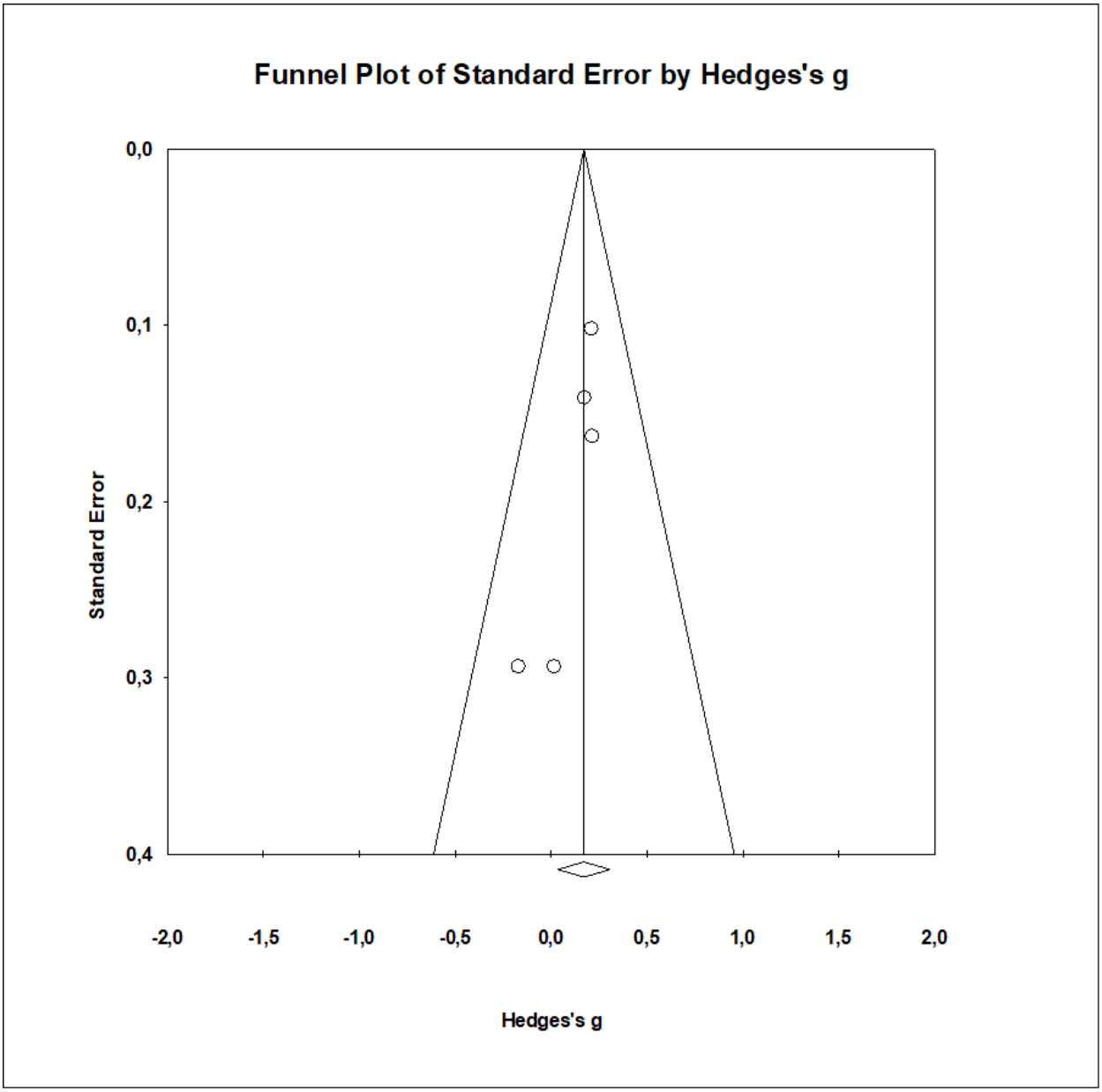
(f) Distal outcomes



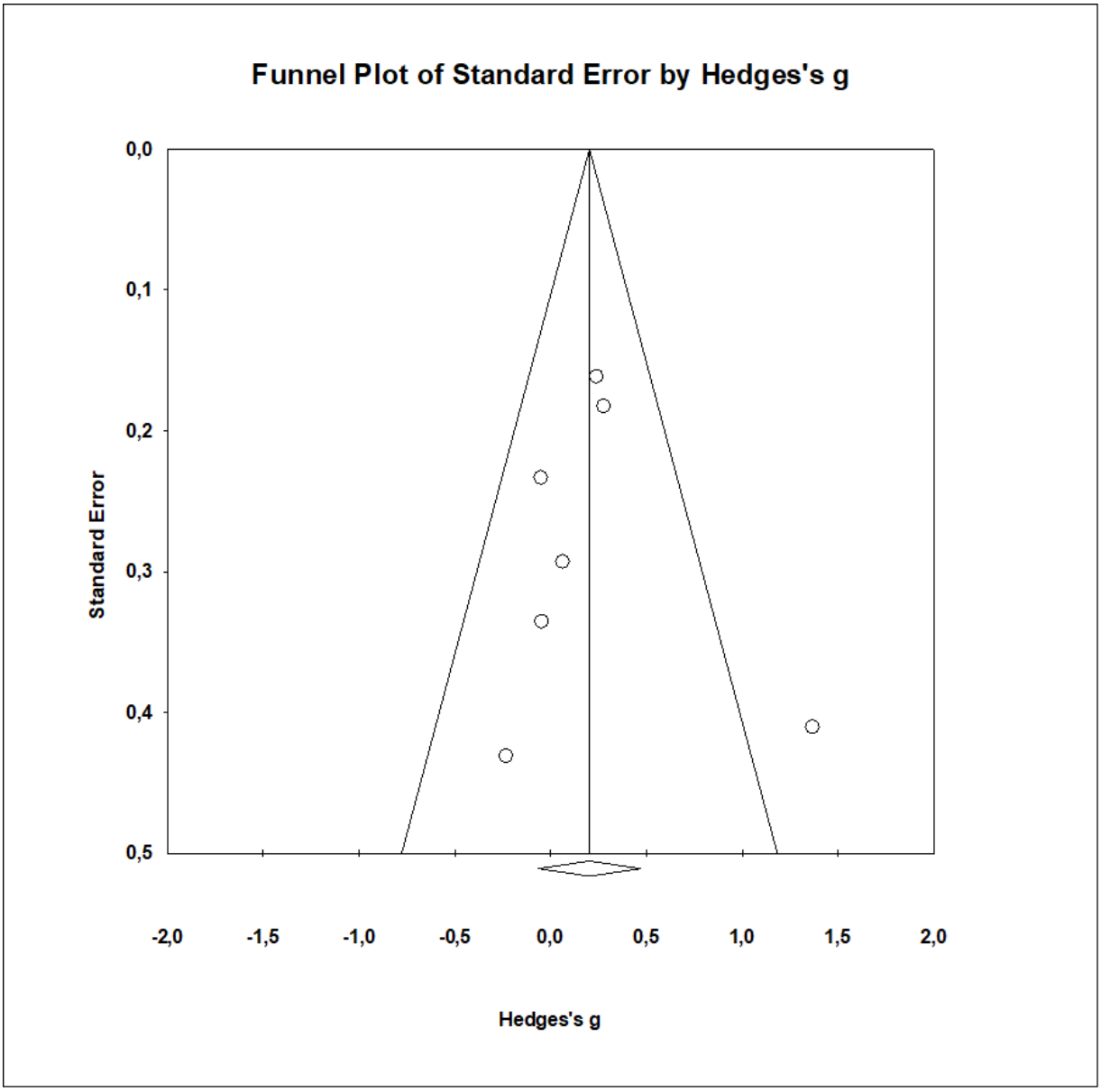
(g) Negative symptoms



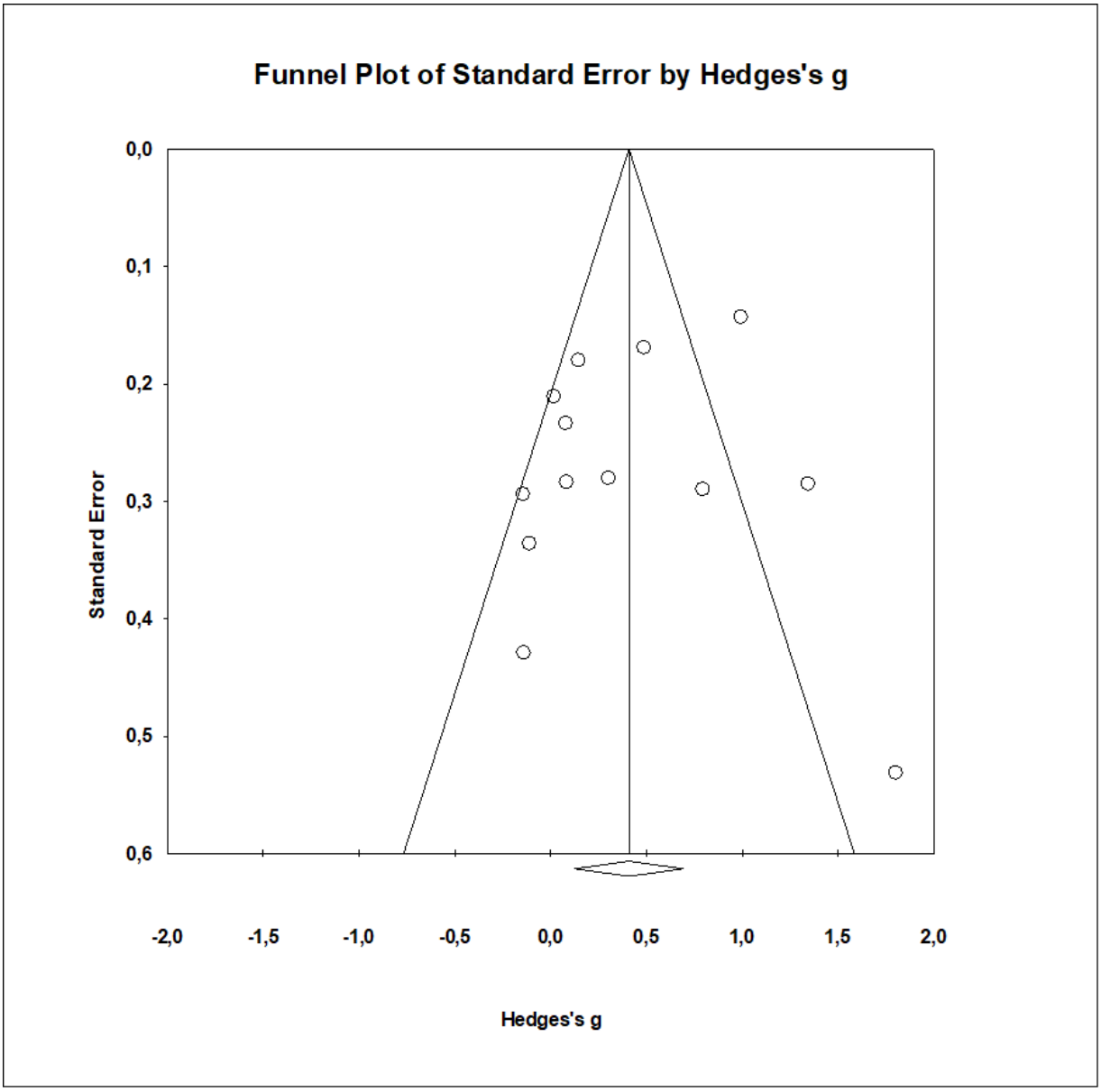
(h) Self-esteem



(i) Quality of life



(j) Functioning



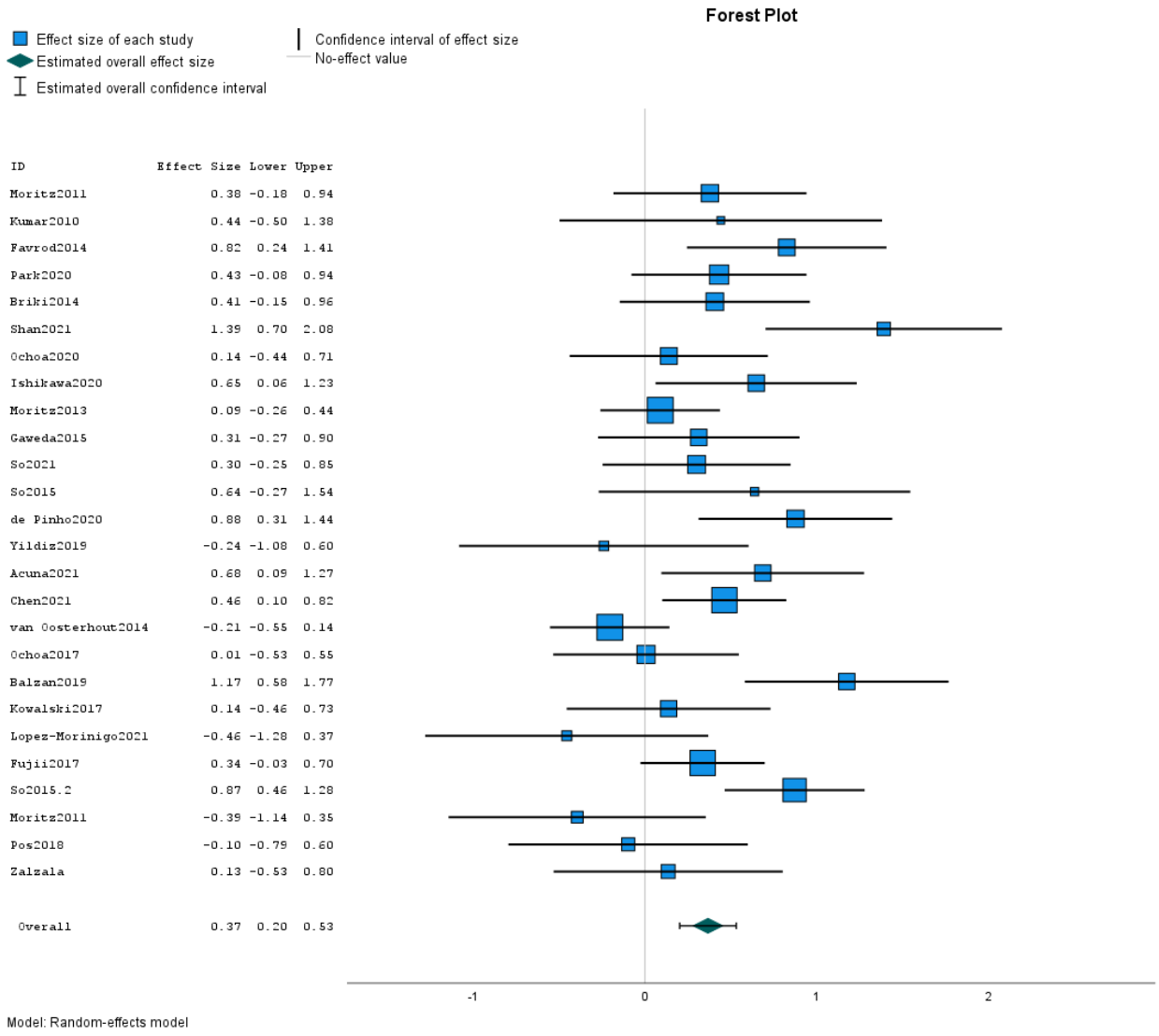
eTable 13. Sensitivity analyses for proximal and distal outcomes measured at pre- and post-intervention.

Correlation between timepoints	Outcome	Nb studies	Nb participants	Estimate (*g*)	Lower 95% CI	Upper 95% CI	*p*-value
0.5	Proximal	38	1717	0.34	0.21	0.46	0.00
0.5	Distal	26	1180	0.28	0.17	0.38	0.00
0.7	Proximal	38	1717	0.39	0.25	0.53	0.00
0.7	Distal	26	1180	0.32	0.19	0.44	0.00
0.9	Proximal	38	1717	0.53	0.38	0.69	0.00
0.9	Distal	26	1180	0.41	0.26	0.56	0.00

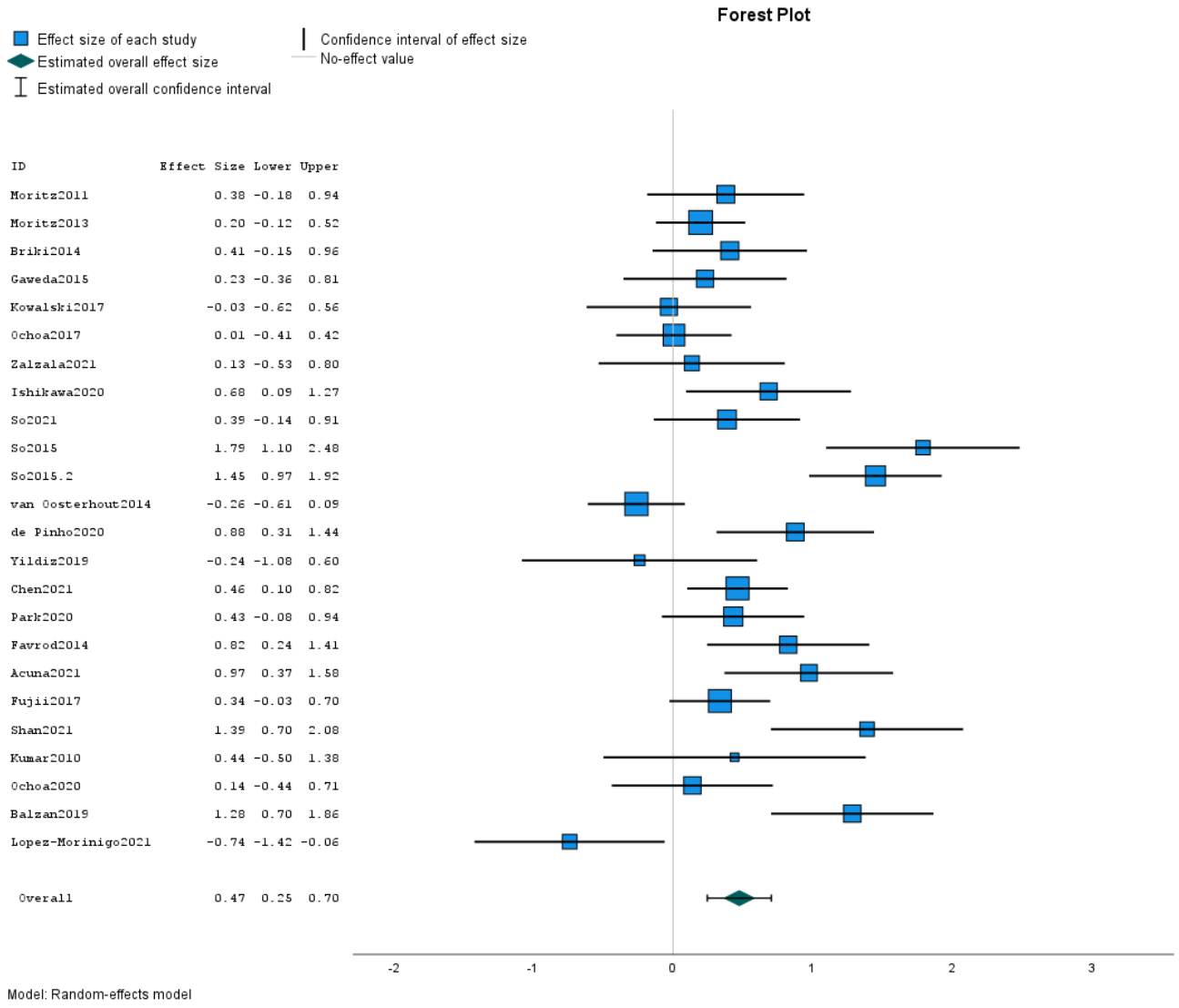
Note. CI = Confidence Intervals; *g* = Hedges' g; Nb = number.

eFigure 4. Forest plots by outcome for the pre-post comparisons including only randomized clinical trials. Effect sizes (Hedges' g) and their 95% confidence intervals for each study, with positive values favoring MCT and negative values favoring the control condition.

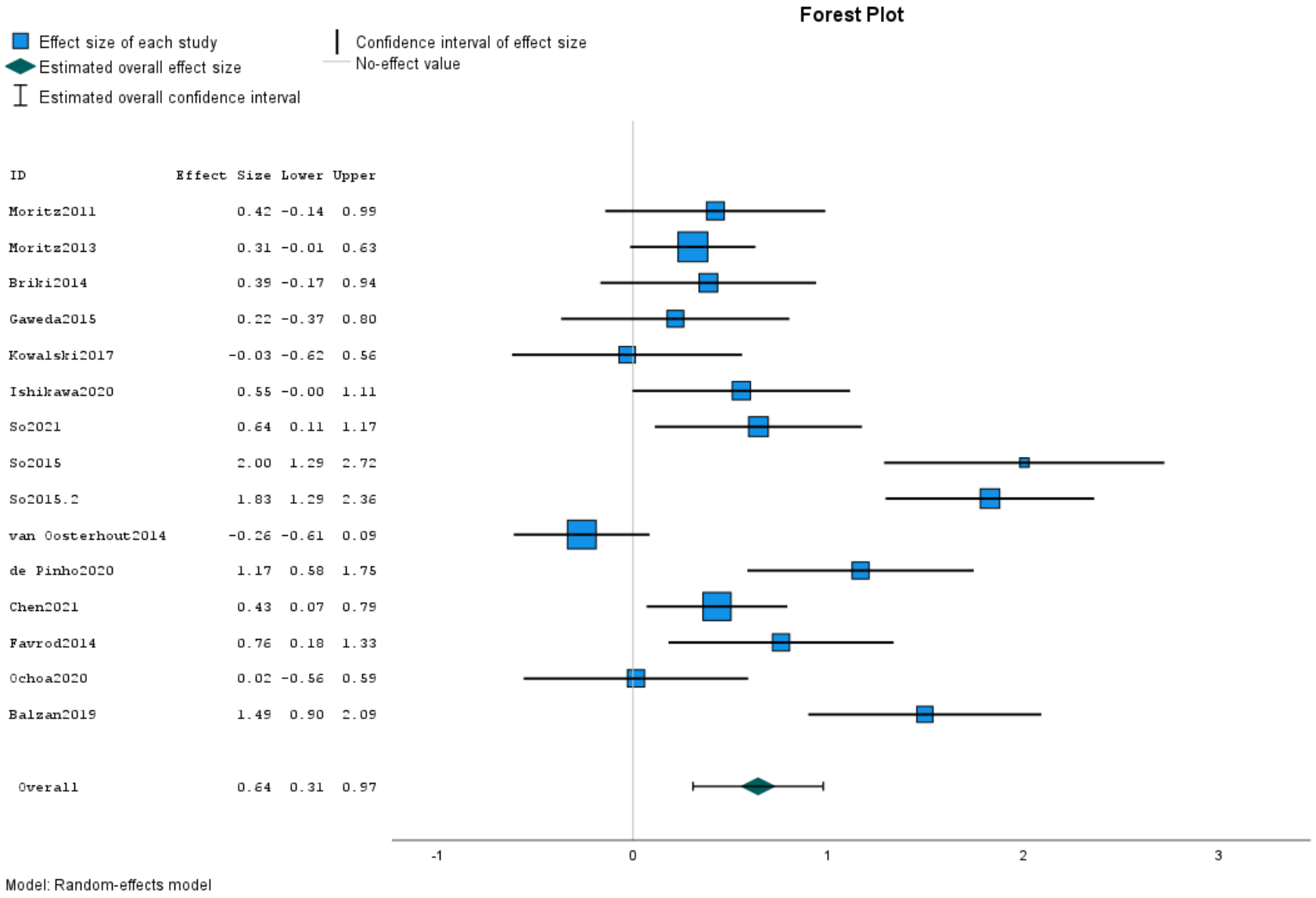
(a) Proximal outcomes



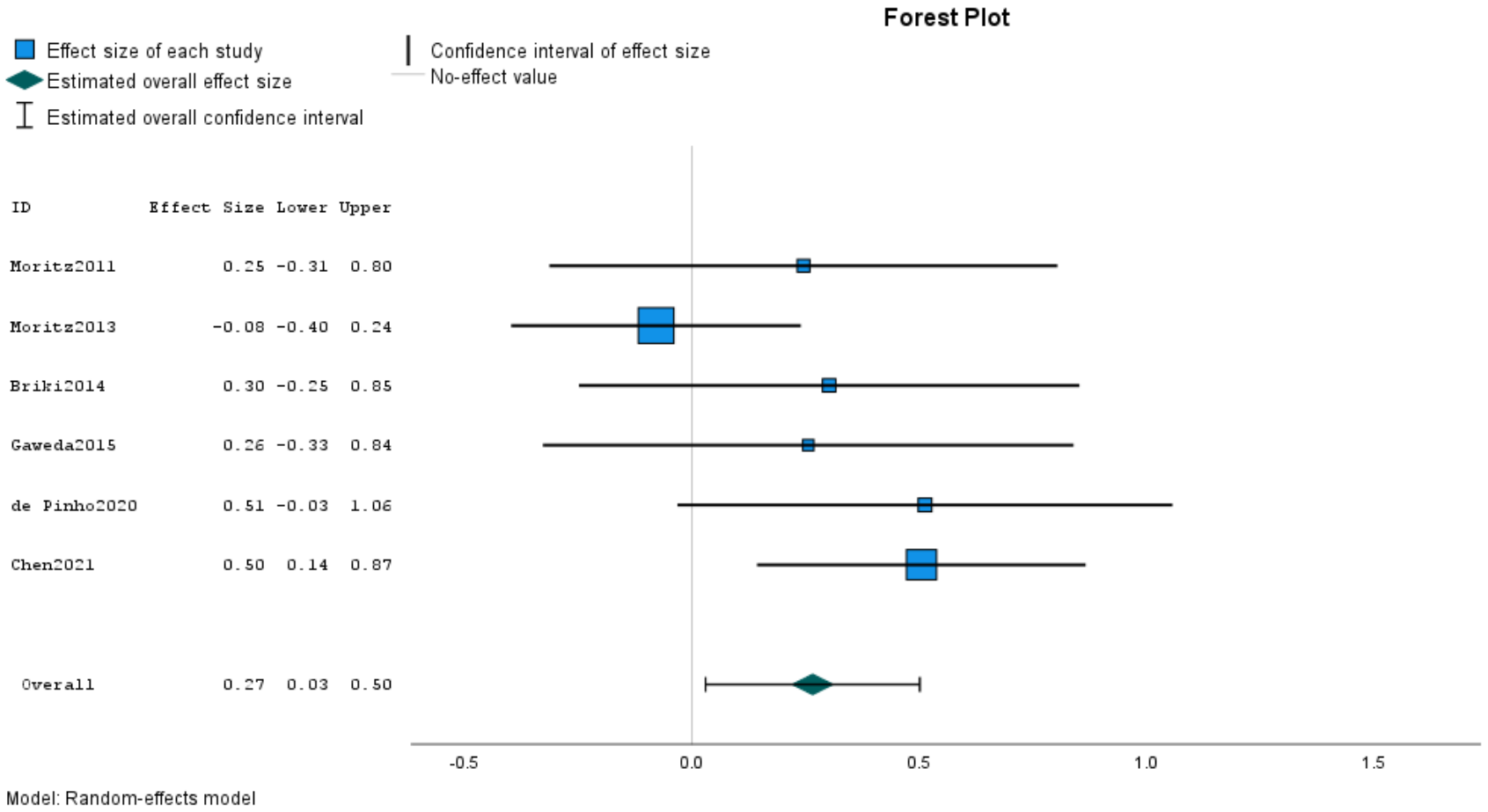
(b) Positive symptoms



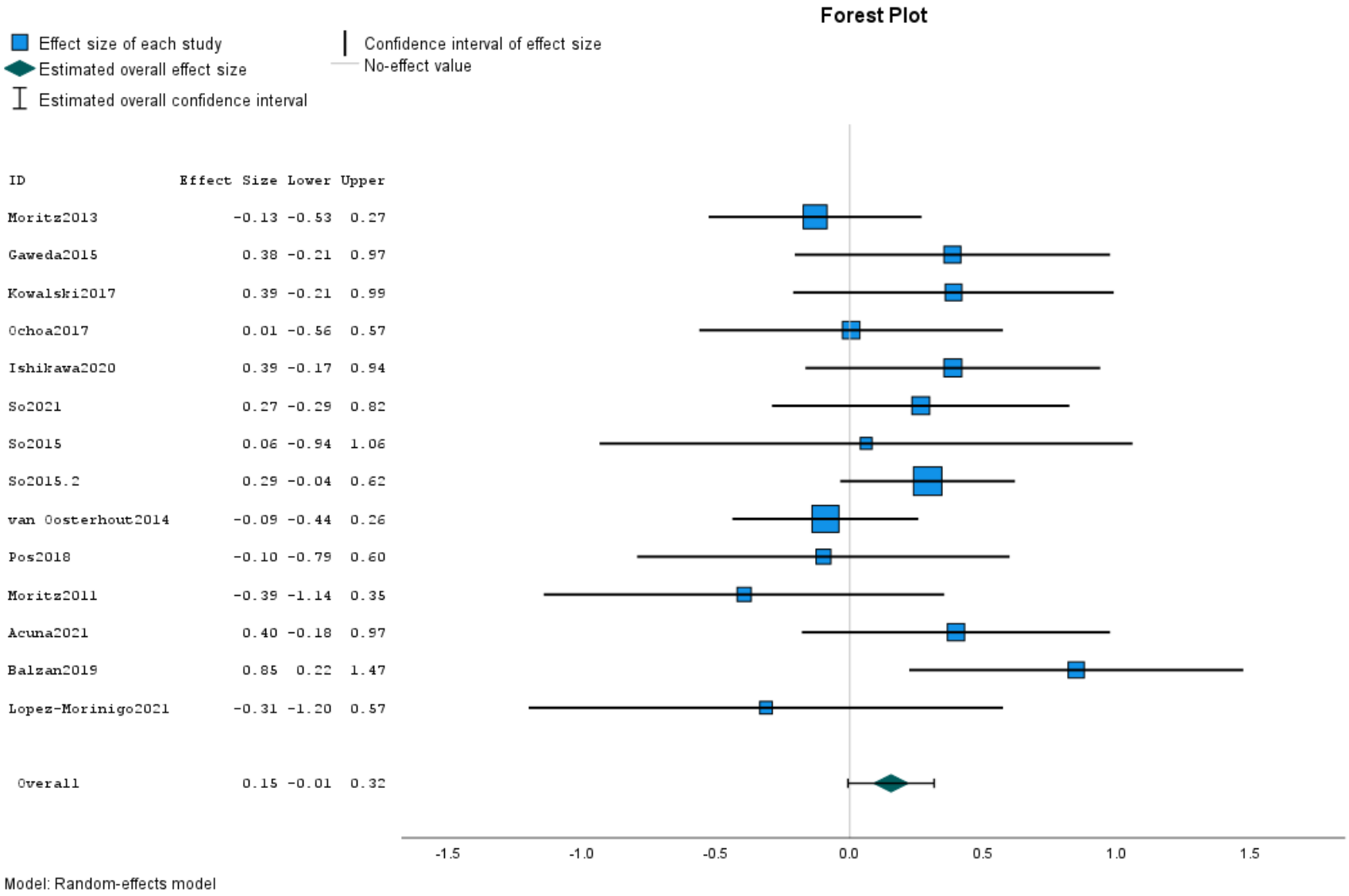
(c) Delusions



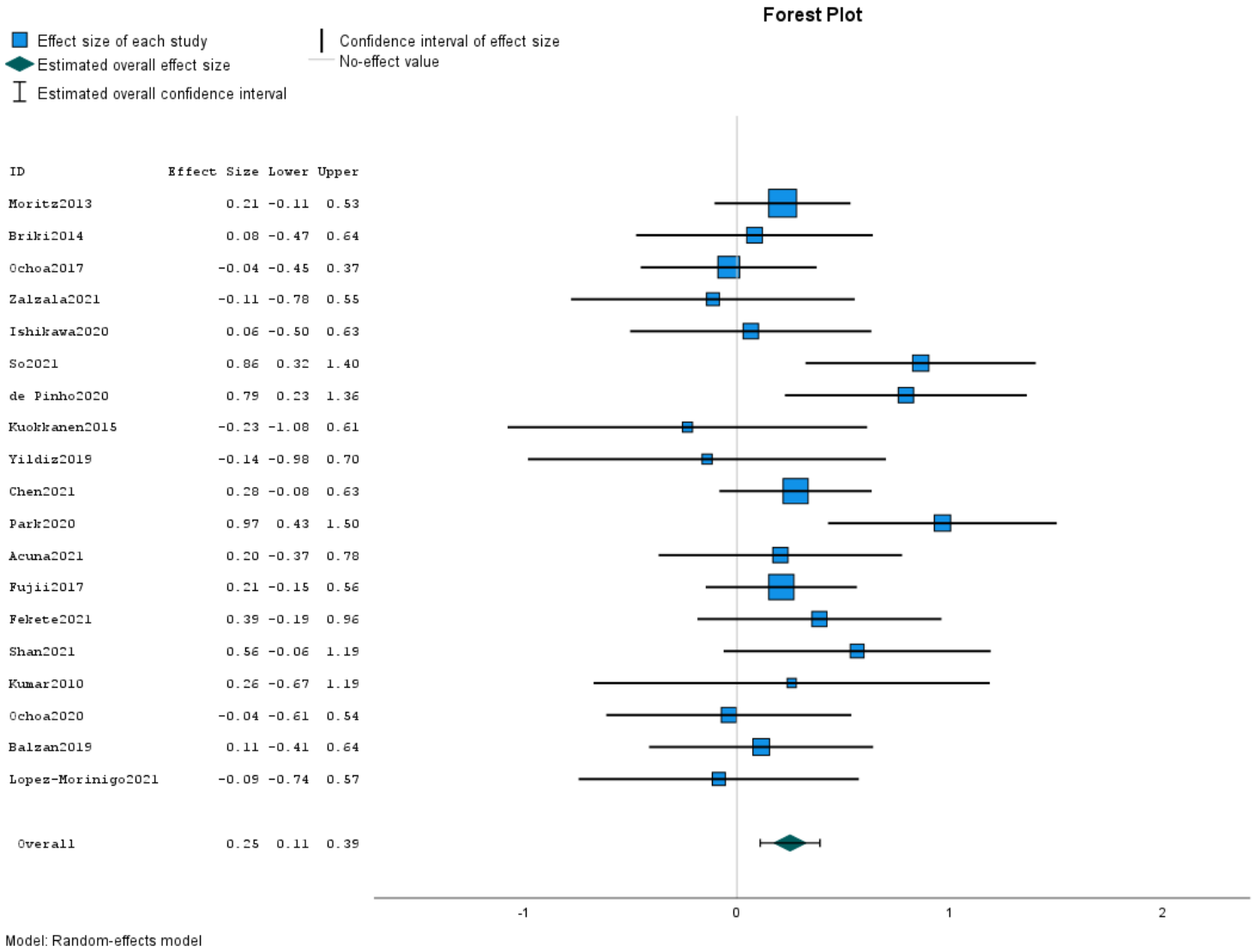
(d) Hallucinations



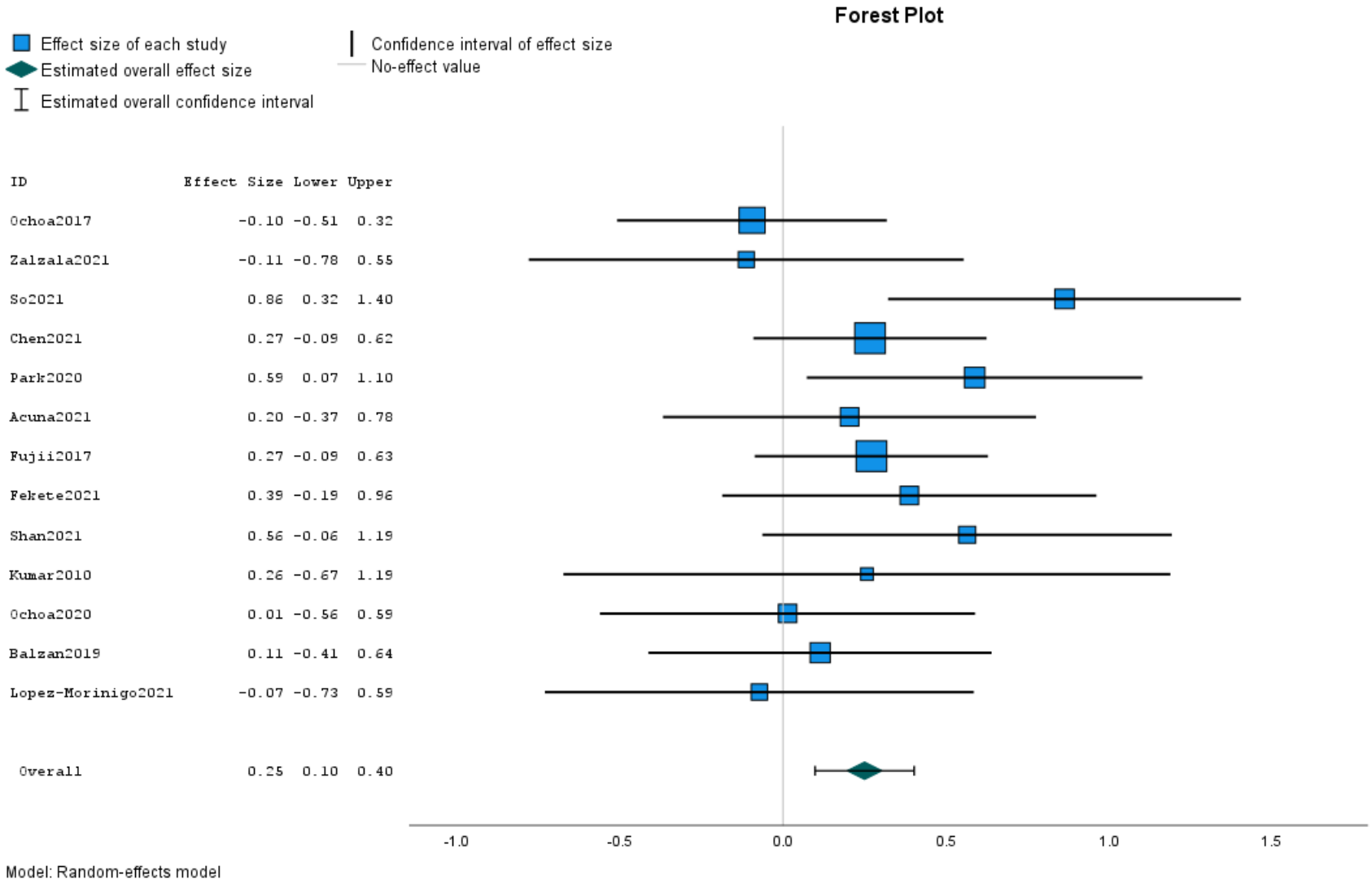
(e) Cognitive biases



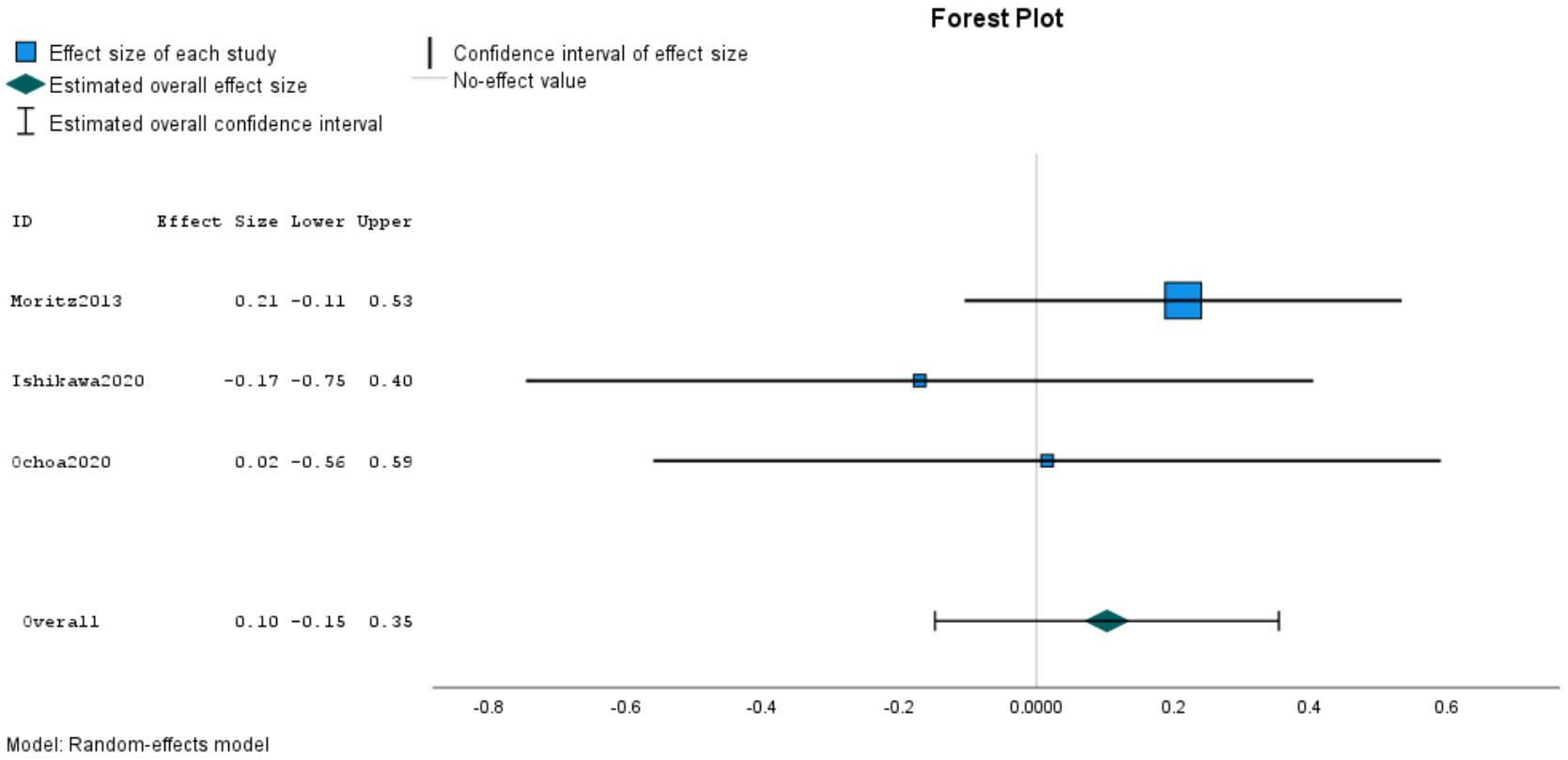
(f) Distal outcomes



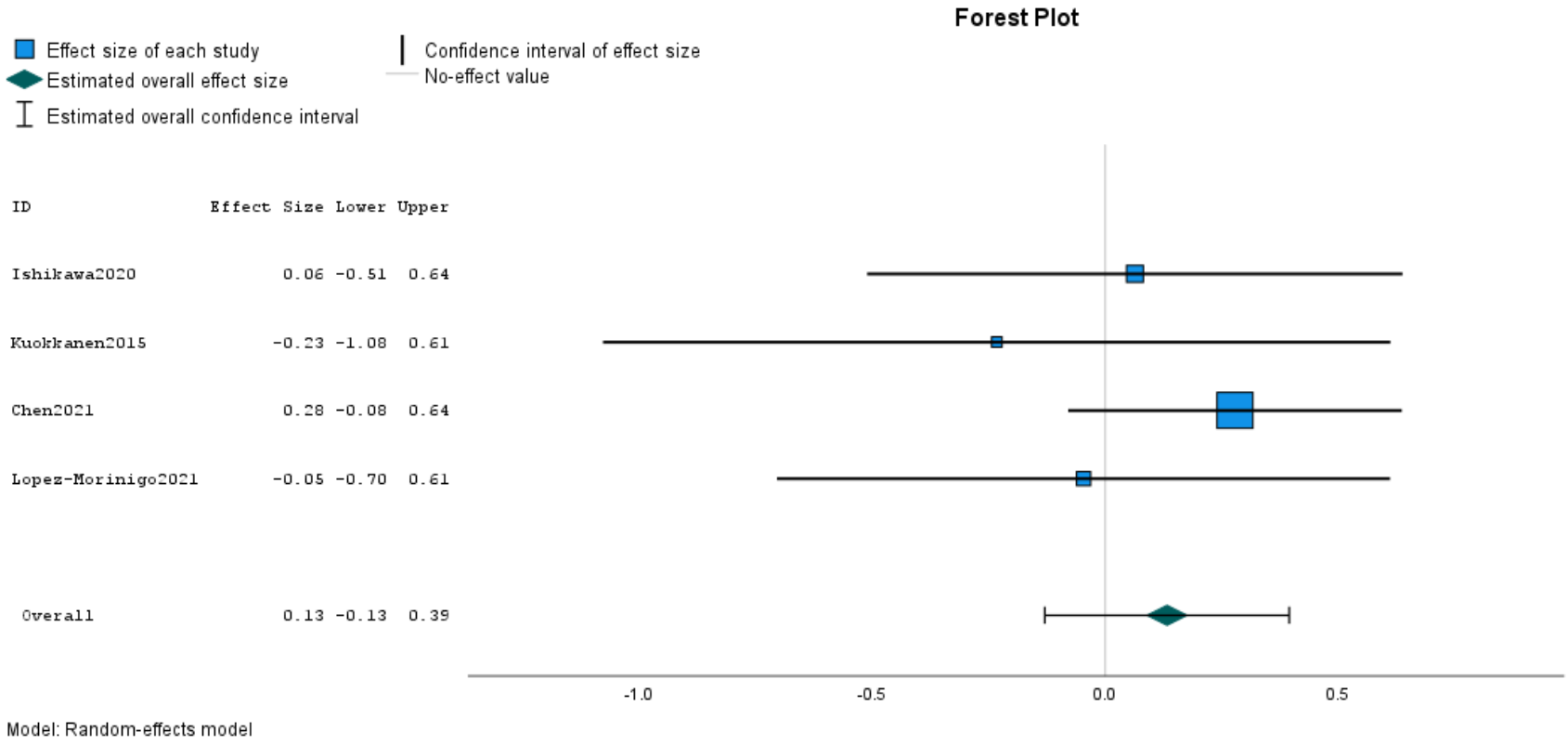
(g) Negative symptoms



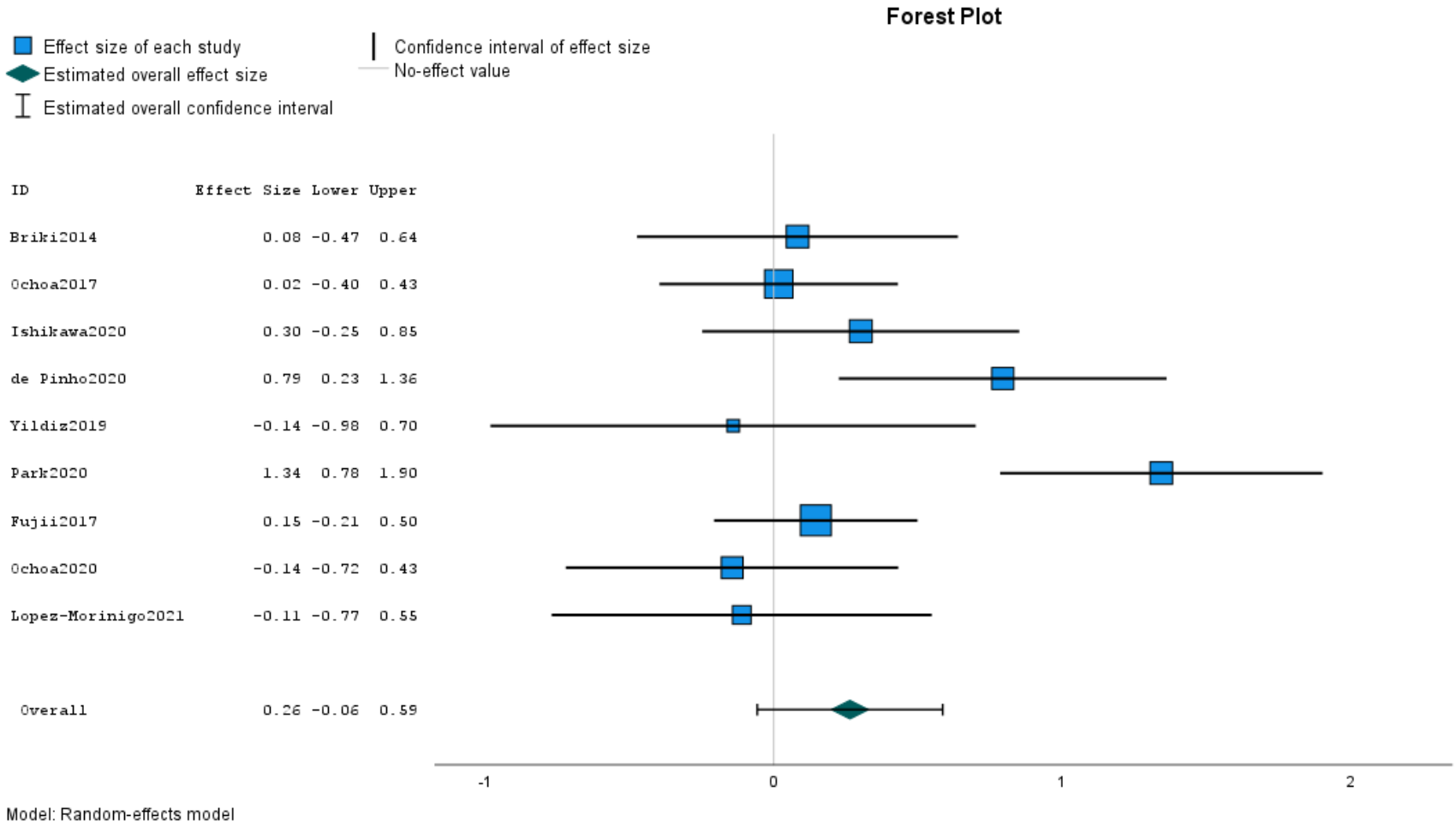
(h) Self-esteem



(i) Quality of life



(j) Functioning



eTable 14. Effect size comparisons between all study designs and RCT-only meta-analyses.

Outcome	Effect sizes for all study designs					Effect sizes for RCTs only				
	N reports	*ES*	*Lower CI*	*Upper CI*	*p-value*	*N reports*	*ES*	*Lower CI*	*Upper CI*	*p-value*
Proximal	38	0.39	0.25	0.53	0.001	26	0.37	0.20	0.53	0.001
Positive symptoms	36	0.50	0.34	0.67	0.001	24	0.47	0.25	0.69	0.001
Delusions	23	0.69	0.45	0.93	0.001	15	0.64	0.32	0.96	0.001
Hallucinations	9	0.26	0.11	0.40	0.001	6	0.26	0.04	0.48	0.02
Cognitive biases	19	0.16	0.03	0.29	0.001	14	0.15	-0.01	0.31	0.06
Distal	26	0.31	0.19	0.44	0.001	19	0.25	0.11	0.39	0.001
Self-esteem	5	0.17	0.03	0.31	0.01	3	0.10	-0.15	0.35	0.42
Negative symptoms	17	0.23	0.10	0.37	0.001	13	0.25	0.10	0.40	0.001
Functioning	13	0.41	0.12	0.69	0.005	9	0.26	-0.05	0.57	0.09
Quality of life	7	0.20	-0.07	0.47	0.14	4	0.13	-0.13	0.39	0.32

Note. Reports Hedges' g effect sizes; pre-post comparisons; RCTs = randomized controlled trials.