**Supplementary Figure 1. PRISMA 2020 flow diagram of included studies**

**Identification of studies via databases and registers**

Records removed *before screening*:

Duplicate records removed (n =215 )

Records identified from\*:

Databases (n = 783)

**Identification**

Records screened

(n =568 )

Records excluded\*\*

(n =540)

Reports not retrieved

(n = 0)

Reports sought for retrieval

(n = 28)

**Screening**

Reports excluded:

 Non RCT (n=1)

Recent onset more than five years (n=2)

 Included other diagnoses (n=3)

Including people with high-risk psychosis (n=1)

Comparing drug treatments (n=1)

Comparing two cognitive treatments (n=1)

Not primary studies (n=2)

Not enough data (n=4)

Not standardized instrument (n=1)

Reports assessed for eligibility

(n = 28)

Studies included in review

(n = 12)

**Included**

**Supplementary Table 1. Correspondence between the tests and the cognitive domains**

|  |  |
| --- | --- |
| **Cognitive domain** | **Neuropsychological tests** |
| **Attention** | Continuous Performance Test Identical Pair Version (CPT-IP)Conners Continuous Performance Test II (CPT-II)MCCB attention subtestTrail Making Test part A (TMT-A)WAIS-III digits span forward subtest |
| **Executive functioning** | Behavior Rating Inventory of Executive Function-Abbreviated form (BRIEF-A)Delis-Kaplan Executive Function System (D-KEFS)MCCB reasoning and problem solving (mazes) subtestModified Six Elements Test (MSET)Stroop Word and Color Test (SWCT)Trail Making Test part B (TMT-B)Tower of London (TOL)Wechsler Abbreviated Scale of Intelligence (WASI)Wisconsin Card Sort Task (WCST)* Working memory

MCCB spatial span and/or letter number sequencing subtestsWAIS-III digits span backward subtest WAIS-IV digits span subtestWAIS-III letter-number sequencing subtestWMS-III spatial span backward subtest |
| **Processing speed** | Brief Assessment of Cognition in Schizophrenia (BACS)MCCB category fluency (animal naming) subtestSpanish version of the Verbal Fluency Test (PMR)WAIS-IV digitsymbol coding subtest |
|  |  |
| **Verbal memory and learning** | Hopkins Verbal Learning Test-Revised (HVLT-R)Immediate and 30-minute paragraph recallMCCB verbal learning subtestRey Auditory Verbal Learning Test (RAVLT)WMS-III immediate and delayed logical memory subtest |
| **Visual memory** | Brief Visuospatial Memory Test-Revised (BVMT-R)MCCB visual learning subtestWMS-III spatial span forward andimmediate and delayed visual reproduction subtestsRey-OsterriethComplex Figure (copy) (ROCF) |
| **Social cognition** | Ambiguous Intentions Hostility Questionnaire-ambiguous situations (Hostility, blame and aggression) (AIHQ-A)Emotion Recognition Task (ERT)Facial Emotion Identification Test (FEIT)Hinting Task (HT)Internal, Personal and Situational Attributions Questionnaire (externalizing, personalizing) (IPSAQ)Mayer–Salovey–Caruso Emotional Intelligence Test (MSCEIT)MCCB social cognition subtestPictures of Facial Affect (PFA)Reading the Mind in the Eyes Test (RMET)Theory of Mind (TOM) |

*Note*: MCCB: MATRICS (National Institute of Mental Health's Measurement and Treatment Research to Improve Cognition in Schizophrenia) Consensus Cognitive Battery; WAIS-III: Wechsler Adult Intelligence Scale 3rd edition; WAIS-IV: Wechsler Adult Intelligence Scale 4th edition; WISC-IV: Wechsler Intelligence Scale for Children 4th edition; WMS-III: Wechsler Memory Scale 3rdedition;

**Supplementary Table 2. Quality assessment of the included RCTs based on the EPHPP criteria**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Authors** | **Selection bias** | **Study design** | **Confounders** | **Blinding** | **Data collection methods** | **Withdrawals/****dropouts** | **Global rating** |
| Christensen et al., 2014 | Moderate | Strong | Strong | Moderate | Strong | Strong | Strong |
| Drake et al., 2014 | Strong | Strong | Strong | Moderate | Strong | Strong | Strong |
| Fernández-Gonzalo et al., 2015 | Strong | Strong | Strong | Weak | Strong | Strong | Strong |
| García-Fernández et al., 2019 | Strong | Strong | Strong | moderate | Strong | Moderate | Strong |
| Hansen et al., 2012 | Weak | Strong | Strong | moderate | Strong | Moderate | Moderate |
| Lowey et al. 2021 | Strong | Strong | Strong | Strong | Strong | Weak | Strong |
| Mendella et al., 2015 | Strong | Strong | Strong | Moderate | Strong | Strong | Strong |
| Nuechterlein et al., 2020 | Moderate | Strong | Strong | Moderate | Strong | Strong | Strong |
| Ochoa et al., 2017 | Strong | Strong | Strong | Moderate | Strong | Moderate | Strong |
| Puig et al., 2014 | Weak | Strong | Strong | Moderate | Strong | Weak | Strong |
| Vidarsdottir et al., 2019 | Moderate | Strong | Strong | Moderate | Strong | Moderate | Strong |
| Wykes et al., 2007 | Moderate | Strong | Strong | Weak | Strong | Strong | Moderate |

**Supplementary Table 3 Effect of cognitive interventions on cognitive functions**

|  |  |  |  |
| --- | --- | --- | --- |
| **Cognitive functions** | Effects (studies) | *g (SE)* | *p*-value |
| Attention | 15 (11) | -0.128 (0.349) | .727 |
| Executive functions | 19 (11) | 0.014 (0.103) | .898 |
| Working memory | 11 (9) | 0.338 (0.273) | .250 |
| Processing speed | 9 (8) | 0.038 (0.107) | .736 |
| Social cognition | 34 (8) | 0.152 (0.082) | .141 |
| Verbal memory and learning | 16 (10) | 0.205 (0.094) | .089 |
| Visual memory | 11 (9) | 0.106 (0.052) | .115 |

Note: *g* = overall standardized mean differences, SE = standard error.

**Supplementary File 1 Results by type of moderator**

1. **Meta-analysis results by intervention type**

 Coef. Estimate SE t-stat d.f. p-val

Cognitive Remediation -0.0810 0.1177 -0.689 2.83 0.543

Cognitive Training 0.0479 0.0834 0.574 1.36 0.646

Combination of any -0.0246 0.0702 -0.351 2.38 0.754

Linear Hypotheses:

 Estimate Std. Error z value Pr(>|z|)

2 - 1 == 0 0.12897 0.16587 0.778 0.716

3 - 1 == 0 0.05641 0.16466 0.343 0.937

3 - 2 == 0 -0.07256 0.18189 -0.399 0.916

(Adjusted p values reported -- single-step method)

1. **Meta-analysis results by control group intervention type**

 Estimate se zval p-val 95%CILB 95% CIUP

Other control condition -0.0346 0.1108 -0.3120 0.7550 -0.2517 0.1825

Other therapy -0.0515 0.2032 -0.2533 0.8000 -0.4497 0.3468

TAU -0.0195 0.0962 -0.2026 0.8395 -0.2080 0.1691

Linear Hypotheses:

 Estimate Std. Error z value Pr(>|z|)

2 - 1 == 0 -0.01691 0.23143 -0.073 0.997

3 - 1 == 0 0.01507 0.14671 0.103 0.994

3 - 2 == 0 0.03198 0.22482 0.142 0.989

1. **Duration of the intervention as a moderator**

 Coef. Estimate SE t-stat d.f. (Satt) p-val (Satt)

Cognitive Remediation -0.5159 0.2787 - 1.85 4.83 0.125 Cognitive Training -0.4324 0.3436 -1.26 2.14 0.328 Combination of any -0.4070 0.2651 -1.54 3.44 0.211 Duration of the intervention 0.0319 0.0209 1.53 3.13 0.221