

Insight

Introduction

Insight with regards to schizophrenia is defined as the awareness of having a mental disorder, including an understanding of the social consequences associated with the disorder; the need for treatment; effects of medication; awareness of the implications; and awareness of the signs and symptoms of the disorder. Clinical insight involves the awareness of the disorder and symptoms, while cognitive insight relates to the ability to question and consider one's beliefs and judgements.

Method

We have included only systematic reviews with detailed literature search, methodology, and inclusion/exclusion criteria that were published in full text, in English, from the year 2000. Reviews were identified by searching the databases MEDLINE, EMBASE, and PsycINFO. Reviews with pooled data are prioritized for inclusion. Reviews reporting fewer than 50% of items on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses ([PRISMA](#)¹) checklist have been excluded from the library. The evidence was graded guided by the Grading of Recommendations Assessment, Development and Evaluation (GRADE) Working Group approach². The resulting table represents an objective summary of the available evidence, although the conclusions are solely the opinion of staff of NeuRA (Neuroscience Research Australia).

Results

We found 11 systematic reviews that met our inclusion criteria³⁻¹³.

- Moderate quality evidence suggests increased global, positive, and negative symptoms are related to lower levels of insight. Conversely, increased depression is related to increased levels of insight.
- Moderate to low quality evidence suggests an association between increased insight

and better work functioning, overall functioning, treatment adherence, social functioning, reduced symptom severity, and fewer re-hospitalisations.

- Moderate quality evidence suggests treatments for schizophrenia can improve insight, particularly if in combination with other treatments that target insight specifically.
- Moderate to high quality evidence suggests small associations between better insight and better overall cognition, executive functioning, memory, and theory of mind.
- High quality evidence finds small associations between increased cognitive insight (self-evaluation ability) and increased total cognition, memory, and executive functioning. Small associations are reported between reduced self-certainty and increased total cognition, memory, and IQ.
- Moderate quality evidence suggests a small, decreased risk of aggression with better insight.
- Moderate to high quality evidence finds a small association between better insight and poorer quality of life.
- High quality evidence finds a medium-size effect of more self-certainty in people at risk of psychosis compared to controls. Moderate quality evidence found no differences in self-reflectiveness or overall cognitive insight.



Insight

Aleman A, Agrawal N, Morgan KD, David AS

Insight in psychosis and neuropsychological function: Meta-analysis

British Journal of Psychiatry 2006; 189: 204-212

[View review abstract online](#)

Comparison	Association between cognition and insight in people with schizophrenia.
Summary of evidence	Moderate to high quality evidence (medium to large samples, direct, consistent, precise) suggests small associations between better insight and better overall cognition, executive functioning and memory.
IQ and insight	
<p><i>Significant, small association between better overall cognition and increased insight;</i> Overall cognition: 11 studies, N = 660, $r = 0.23$, 95%CI 0.15 to 0.30, $p < 0.0001$, $Q_w = 4.8$, $p = 0.91$ IQ: 4 studies, N = 174, $r = 0.26$, 95%CI 0.12 to 0.40, $p < 0.001$, $Q_w = 0.6$, $p = 0.89$</p>	
Memory and insight	
<p><i>Significant, small association between better memory and increased insight;</i> 3 studies, N = 129, $r = 0.28$, 95%CI 0.11 to 0.43, $p = 0.002$, $Q_w = 1.1$, $p = 0.58$</p>	
Executive functioning and insight	
<p><i>Significant, small association between better executive functioning and increased insight;</i> Executive functioning: 5 studies, N = 331, $r = 0.19$, 95%CI 0.08 to 0.30, $p = 0.001$, $Q_w = 5.0$, $p = 0.97$ WCST: 5 studies, N = 311, $r = 0.25$, 95%CI 0.14 to 0.36, $p < 0.0001$, $Q_w = 4.3$, $p = 0.37$</p>	
Consistency in results[‡]	Consistent
Precision in results[§]	Precise
Directness of results	Direct

Insight

Belvederi Murri B, Respino M, Innamorati M, Cervetti A, Calcagno P, Pompili M, Lamis DA, Ghioia L, Amore M

Is good insight associated with depression among patients with schizophrenia? Systematic review and meta-analysis

Schizophrenia Research 2015; 162: 234–247

[View review abstract online](#)

Comparison	Association between insight and depression in people with schizophrenia. Some studies included patients with affective psychoses.
Summary of evidence	Moderate to high quality evidence (large sample, direct, inconsistent, precise) suggests a weak association between awareness and attribution of symptoms or mental disorder and depression scores.

Insight and depression

Insight assessed by: Scale to Assess Unawareness of Mental Disorder, Schedule for the Assessment of Insight, original or Expanded version, Birchwood Insight Scale, Insight and Treatment Attitudes Questionnaire, G12 from the Positive and Negative Syndrome Scale, Beck Cognitive Insight Schedule, Self-Appraisal of Illness Questionnaire

Depression assessed by: Calgary Depression Rating Scale, item G6 of the Positive and Negative Syndrome Scale, item 9 of the Brief Psychiatric Rating Scale, Beck Depression Inventory, Hamilton Depression Rating Scale, Montgomery–Asberg Depression Rating Scale, Center for Epidemiologic Studies Depression Scale, Depression Anxiety and Stress Scale

Weak, significant relationship between awareness and attribution of symptoms or mental disorder, and depression scores;

59 studies overall with 9,276 patients

Total scores: 37 effect sizes, $r = 0.14$, 95%CI 0.12 to 0.16, $p < 0.001$, $I^2 = 91%$, $p < 0.001$

Awareness of symptoms: 10 effect sizes, $r = 0.14$, 95%CI 0.07 to 0.21, $p < 0.001$, $I^2 = 70%$, $p < 0.001$

Attribution of symptoms: 8 effect sizes, $r = 0.17$, 95%CI 0.09 to 0.25, $p < 0.001$, $I^2 = 41%$, $p = 0.10$

Awareness of mental disorder: 20 effect sizes, $r = 0.14$, 95%CI 0.09 to 0.19, $p < 0.001$, $I^2 = 82%$, $p < 0.001$

Self-reflectiveness: 7 effect sizes $r = 0.13$, 95%CI 0.04 to 0.23, $p = 0.006$, $I^2 = 48%$, $p = 0.07$

Self-certainty: 6 effect sizes $r = 0.13$, 95%CI 0.06 to 0.21, $p = 0.001$, $I^2 = 95%$, $p < 0.001$

No relationship between awareness of social consequences or need for treatment and depression

<i>scores;</i>	
Awareness of the social consequences: 6 effect sizes, $r = 0.06$, 95%CI -0.05 to 0.17 , $p = 0.26$, $I^2 = 79%$, $p < 0.001$	
Awareness of need for treatment: 15 effect sizes, $r = 0.03$, 95%CI -0.02 to 0.09 , $p = 0.27$, $I^2 = 78%$, $p < 0.001$	
<p>Meta-regression modelling explained 35% of the between-study effect size heterogeneity and showed the use of the Calgary Depression Rating Scale, Montgomery–Asberg Depression Rating Scale, Beck Depression Inventory, Positive and Negative Syndrome Scale, or the Brief Psychiatric Rating Scale were associated with stronger associations between insight and depression than other depression scales. Being in the acute phase of the illness was a negative predictor of the effect sizes ($p = 0.01$), while the post-acute phase showed a non-significant trend for a positive association ($p = 0.07$). The year of publication was a significant negative predictor of the effect size ($p = 0.002$). The instrument used to assess insight, the insight component and the severity of depressive, positive and negative symptoms were not significant predictors.</p>	
Consistency in results	Inconsistent, partly explained by meta-regression model.
Precision in results	Precise
Directness of results	Direct

<i>Bora E</i>	
Relationship between insight and theory of mind in schizophrenia: A meta-analysis	
Schizophrenia Research 2017; 190: 11-7	
View review abstract online	
Comparison	Association between theory of mind and insight in people with schizophrenia.
Summary of evidence	High quality evidence (large sample, direct, consistent, precise) suggests a small association between better insight and better theory of mind.
Theory of mind and clinical insight	
<i>Significant, small association between increased theory of mind scores and increased clinical insight;</i>	
14 studies, $N = 1,029$, $r = 0.28$, 95%CI 0.20 to 0.36 , $p < 0.001$, $I^2 = 35%$, $p = 0.10$	



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There were no differences in results according to mean age, gender, duration of education, duration of illness, or severity of symptoms.	
Consistency in results	Consistent
Precision in results	Precise
Directness of results	Direct

Davis BJ, Lysaker PH, Salyers MP, Minor KS

The insight paradox in schizophrenia: A meta-analysis of the relationship between clinical insight and quality of life

Schizophrenia Research 2020; 223: 9-17

[View review abstract online](#)

Comparison	Association between quality of life and insight in people with schizophrenia.
Summary of evidence	Moderate to high quality evidence (large sample, direct, inconsistent, precise) suggests a small association between better insight and poorer quality of life.
Quality of life and clinical insight	
<p>20 studies, N = 1,170</p> <p><i>Significant, small association between increased clinical insight and decreased quality of life;</i> 14 studies, $r = -0.128$, 95%CI -0.218 to -0.037, $p = 0.006$, $I^2 = 57%$, $p = 0.005$</p> <p>Subgroup analysis showed only awareness of illness was associated with poor quality of life. Insight into illness attribution, need for treatment, and consequence of illness were not associated with quality of life.</p> <p>Increased symptom severity was associated with reduced effect size between overall clinical insight and quality of life.</p> <p>There were no moderating effects of insight or quality of life measures.</p>	
Consistency in results	Inconsistent
Precision in results	Precise
Directness of results	Direct



Insight

Donde C, Laprevote V, Lavalle L, Haesebaert F, Fakra E, Brunelin J

Cognitive insight in individuals with an at-risk mental state for psychosis: A meta-analysis

Early Intervention in Psychiatry 2021; 15(3): 449-56

[View review abstract online](#)

Comparison	Cognitive insight in people at risk of psychosis vs. controls.
Summary of evidence	High quality evidence (large sample, consistent, precise, direct) finds a medium-size effect of more self-certainty in people at risk of psychosis compared to controls. Moderate quality evidence (inconsistent and imprecise) found no differences in self-reflectiveness and overall cognitive insight.
Cognitive insight	
<p><i>A medium-size effect showed people at risk of psychosis showed more self-certainty than controls;</i> 5 studies, N = 679, $g = 0.45$, 95%CI 0.23 to 0.67, $p < 0.005$, $I^2 = 41\%$, $Qp = 0.14$</p> <p><i>There were no significant differences in self-reflectiveness or overall cognitive insight;</i> Self-reflectiveness: 5 studies, N = 679, $g = -0.56$, 95%CI -0.18 to 1.29, $p = 0.14$, $I^2 = 95\%$, $Qp < 0.001$</p> <p>Overall cognitive insight: 5 studies, N = 679, $g = -0.24$, 95%CI -0.43 to 0.91, $p = 0.45$, $I^2 = 94\%$, $Qp < 0.001$</p>	
Consistency in results	Consistent for self-certainty, inconsistent for self-reflectiveness and overall cognitive insight.
Precision in results	Precise for self-certainty, imprecise for self-reflectiveness and overall cognitive insight.
Directness of results	Direct

Lincoln TM, Lüllmann E, Rief W

Correlates and long-term consequences of poor insight in patients with

schizophrenia. A systematic review

Schizophrenia Bulletin 2007; 33 (6): 1324-1342

[View review abstract online](#)

Comparison	Association between insight, cognition and symptoms in people with schizophrenia.
Summary of evidence	Moderate to low quality evidence (mixed sample sizes, direct, unable to assess consistency or precision) suggests an association between better insight and better work functioning, overall functioning, treatment adherence, social functioning, reduced symptom severity and fewer re-hospitalisations. There was an association between better insight and worse depressive symptoms.
Insight and treatment adherence	
<p>7 studies (N = 476) reported an association between increased insight and better treatment adherence. Two of these studies reported that adherence diminished after 1 year (N = 74) or 2 years (N = 61).</p> <p>2 studies (N = 131) reported no association between insight and use of services or adherence to medication.</p>	
Insight on social adjustment and functional outcomes	
<p>2 studies (N = 127) reported that lower insight was associated with worse work performance including lower social skills, work quality, cooperativeness and personal presentation at work. Impaired insight was also associated with poorer overall functioning (1 study, N = 23), social functioning (1 study, N = 74) and social adjustment and symptom discomfort (1 study, N = 32).</p>	
Insight, symptoms and hospitalisation	
<p>8 studies (N = 1,157) reported a significant association between poorer insight and increased symptom severity (general psychopathology, BPRS scores, positive, negative and depressive symptoms and anxiety).</p> <p>1 study (N = 74) reported an association between poorer insight regarding treatment and increased re-hospitalisation, but no association between insight regarding mental health status and rehospitalisation.</p> <p>3 studies (N = 175) reported no association between insight, symptoms and re-hospitalisation.</p>	
Insight and depression	



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4 studies (N = 512) reported an association between increased insight and increased depressive symptoms, lower self-esteem (2 studies, N = 362) and positive and negative symptoms (1 study, N = 100).

1 study (N = 101 first-episode schizophrenia/ schizoaffective) reported an association between greater insight and increased depression and suicide at follow-up when using the Birchwood Scale, but no association using the PANSS.

1 study (N = 980) reported an association between increased insight and increased suicide events, but no association with depression. Increased insight as a function of treatment was associated with decreased risk of suicide.

1 study (N = 33) reported an association between lower insight/awareness of symptoms and increased depression ($r = -0.46 - 0.58$).

1 study (N = 74) reported no association between insight and suicidal tendency during a 1 year follow-up.

Consistency	Unable to assess; no measure of consistency is reported.
Precision	Unable to assess; no measure of precision is reported.
Directness	Direct

Mintz A, Dobson K, Romney D

Insight in schizophrenia: a meta-analysis

Schizophrenia Research 2003; 61: 75-88

[View review abstract online](#)

Comparison	Association between insight (patient’s awareness of the disorder) and symptom dimensions in people with schizophrenia.
Summary of evidence	Moderate quality evidence (mixed sample sizes, some inconsistency, some imprecision, direct) suggests increased global, positive and negative symptoms may be related to lower levels of insight of the disorder and its consequences. Conversely, increased depression is related to increased levels of insight.
Global symptoms	
<i>A medium negative association suggests that as global symptoms increase in patients with</i>	



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schizophrenia, they may demonstrate less overall insight;

19 studies, N = 1,361: $r = -0.27$, $p < 0.001$, 95%CI -0.41 to -0.13, $Q_w p > 0.05$

Less insight for the following components;

Awareness of mental disorder: 8 studies, N = 742, $r = -0.20$, $p < 0.001$, 95%CI -0.54 to 0.13, $Q_w = 31.24$, $p < 0.001$

Awareness of social consequences: 2 studies, N = 251, $r = -0.27$, $p < 0.001$, 95%CI -0.27 to -0.27, $Q_w p > 0.05$

Awareness of need for treatment: 4 studies, N = 323, $r = -0.25$, $p < 0.001$, 95%CI -0.25 to -0.25, $Q_w p > 0.05$

Awareness of symptoms: 2 studies, N = 108, $r = -0.41$, $p < 0.001$, 95%CI -0.61 to -0.22, $Q_w p > 0.05$

Attribution of symptoms: 2 studies, N = 108, $r = -0.21$, $p < 0.05$, 95%CI -0.43 to 0.01, $Q_w p > 0.05$

Composite of awareness of mental disorder, awareness of social consequences of disorder and awareness of need for treatment;

14 studies, N = 926, $r = -0.24$, $p < 0.001$, 95%CI -0.54 to 0.06, $Q_w = 38.01$, $p < 0.001$

Positive symptoms

A medium negative association suggests that as positive symptoms increase in patients with schizophrenia, they may demonstrate less overall insight;

22 studies, N = 1,616, $r = -0.25$, $p < 0.001$, 95%CI -0.64 to 0.13, $Q_w = 92.32$, $p < 0.001$

Note: Subgroup analysis suggests that this relationship was strongest in samples that were comprised of a large percentage of acutely psychotic patients.

Less insight for the following components;

Awareness of mental disorder: 9 studies, N = 686, $r = -0.32$, $p < 0.001$, 95%CI -0.68 to 0.04, $Q_w = 37.59$, $p < 0.001$

Awareness of social consequences: 3 studies, N = 191, $r = -0.33$, $p < 0.001$, 95%CI -0.33 to -0.33, $Q_w p > 0.05$

Awareness of the need for treatment: 2 studies, N = 136, $r = -0.31$, $p < 0.001$, 95%CI -0.31 to -0.31, $Q_w p > 0.05$

Awareness of symptoms: 3 studies, N = 100, $r = -0.23$, $p < 0.01$, 95%CI -0.23 to -0.23, $Q_w p > 0.05$

Attribution of symptoms to disorder: 3 studies, N = 146, $r = -0.16$, $p < 0.05$, 95%CI -0.72 to 0.39, $Q_w = 15.28$, $p < 0.001$

Composite of awareness of mental disorder, awareness of social consequences of disorder and awareness of need for treatment;

9 studies, N = 807, $r = -0.18$, $p < 0.001$, 95%CI -0.35 to 0.00, $Q_w = 16.02$, $p < 0.05$

Negative symptoms



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A medium negative association suggests that as negative symptoms increase in patients with schizophrenia, they may demonstrate less overall insight;

20 studies, N = 1,487, $r = -0.23$, $p < 0.001$, 95%CI -0.48 to 0.02, $Q_w = 47.69$, $p < 0.001$

Note: Subgroup analysis suggests that this relationship was strongest in patients with an older age of onset of the disorder.

And less insight for the following components;

Awareness of mental disorder: 8 studies, N = 619, $r = -0.20$, $p < 0.001$, 95%CI -0.45 to 0.04, $Q_w = 18.63$, $p < 0.01$

Awareness of social consequences: 2 studies, N = 125, $r = -0.40$, $p < 0.001$, 95%CI -0.40 to -0.40, $Q_w p > 0.05$

Awareness of need for treatment: 2 studies, N = 136, $r = -0.40$, $p < 0.001$, 95%CI -0.40 to -0.40, $Q_w p > 0.05$

Attribution of symptoms: 3 studies, N = 146, $r = -0.33$, $p < 0.001$, 95%CI -0.33 to -0.33, $Q_w p > 0.05$

No significant association was reported between awareness of symptoms and negative symptoms;

2 studies, N = 71, $r = -0.16$, $p > 0.05$, 95%CI -0.16 to -0.16, $Q_w p > 0.05$

Composite of awareness of mental disorder, awareness of social consequences of disorder and awareness of need for treatment;

11 studies, N = 800, $r = -0.29$, $p < 0.001$, 95%CI -0.63 to 0.04, $Q_w = 38.68$, $p < 0.001$

Depressive symptoms

A weak positive association suggests that as depressive symptoms increase in patients with schizophrenia, they may demonstrate more overall insight;

15 studies, N = 1,218, $r = 0.18$, $p < 0.001$, 95%CI -0.14 to 0.49, $Q_w = 48.63$, $p < 0.001$

And less insight for the following components;

Awareness of mental disorder: 7 studies, N = 579, $r = 0.11$, $p < 0.01$, 95%CI -0.24 to 0.46, $Q_w = 26.14$, $p < 0.001$

Awareness of social consequences: 2 studies, N = 121, $r = 0.21$, $p < 0.01$, 95%CI -0.09 to 0.52, $Q_w = 5.14$, $p < 0.05$

Awareness of need for treatment: 3 studies, N = 236, $r = 0.16$, $p < 0.01$, 95%CI 0.16 to 0.16, $Q_w p > 0.05$

Awareness of symptoms: 4 studies, N = 215, $r = 0.39$, $p < 0.001$, 95%CI 0.39 to 0.39, $Q_w p > 0.05$

Attribution of symptoms to disorder: 4 studies, N = 175, $r = 0.21$, $p < 0.01$, 95%CI -0.16 to 0.60, $Q_w = 11.26$, $p < 0.05$

Composite of awareness of mental disorder, awareness of social consequences of disorder and awareness of need for treatment;

6 studies, N = 545, $r = 0.20$, $p < 0.001$, 95%CI 0.01 to 0.40, $Q_w = 12.25$, $p < 0.01$



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Consistency	Inconsistent for all measures except for awareness of social consequences for global, positive, and negative symptoms; awareness of the need for treatment for all symptoms; awareness of symptoms for all symptoms; and attribution of symptoms for global and negative symptoms.
Precision	Precise for all measures except the composite measure for global and negative symptoms; overall insight for positive and depressive symptoms; awareness of the mental disorder for positive and depressive symptoms; attribution of symptoms to the disorder for positive and depressive symptoms; and awareness of social consequences for depressive symptoms.
Directness	Direct

Nair A, Palmer EC, Aleman A, David AS

Relationship between cognition, clinical and cognitive insight in psychotic disorders: A review and meta-analysis

Schizophrenia Research 2014; 152: 191-200

[View review abstract online](#)

Comparison	Associations between clinical and cognitive insight and cognitive functioning in people with schizophrenia.
Summary of evidence	High quality evidence (medium to large samples, precise, consistent, direct) suggests small associations between increased clinical insight and increased total cognition, IQ, memory, verbal memory, executive functioning and Wisconsin Card Sorting Test performance. Small associations are also reported between increased composite cognitive insight and increased total cognition, memory and executive functioning, but not IQ. Small associations are reported between reduced self-certainty and increased total cognition, memory and IQ, but not executive functioning, and no significant associations were found for any of the self-reflectiveness measures.
Associations between clinical insight (ability to identify symptoms as being a mental disorder) and cognitive functioning	
<i>Significant, small associations between increased clinical insight and increased total cognition, IQ, memory, verbal memory, executive functioning and performance on the Wisconsin Card Sorting</i>	



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Test;

Total cognition: 34 studies, N = 1,821, $r = 0.17$, 95%CI 0.12 to 0.21, $p < 0.001$, $Q_w = 31.46$, $p = 0.54$, $I^2 = 0\%$

IQ: 19 studies, N = 951, $r = 0.20$, 95%CI 0.13 to 0.26, $p < 0.001$, $Q_w = 12.86$, $p = 0.80$, $I^2 = 0\%$

Memory: 14 studies, N = 707, $r = 0.15$, 95%CI 0.05 to 0.25, $p < 0.001$, $Q_w = 22.05$, $p = 0.05$, $I^2 = 41\%$

Verbal memory: 5 studies, N = 296, $r = 0.15$, 95%CI 0.01 to 0.28, $p = 0.03$, $Q_w = 5.12$, $p = 0.28$, $I^2 = 22\%$

Executive functioning: 25 studies, N = 1,333, $r = 0.14$, 95%CI 0.08 to 0.20, $p < 0.001$, $Q_w = 26.74$, $p = 0.32$, $I^2 = 10\%$

Wisconsin Card Sorting Test: 13 studies, N = 792, $r = 0.15$, 95%CI 0.05 to 0.25, $p < 0.001$, $Q_w = 21.29$, $p = 0.05$, $I^2 = 44\%$

No associations with working memory and non-verbal memory;

Working memory: 6 studies, N = 291, $r = 0.20$, 95%CI -0.06 to 0.44, $p = 0.13$, $Q_w = 21.44$, $p = 0.13$, $I^2 = 77\%$

Non-verbal memory: 5 studies, N = 236, $r = 0.12$, 95%CI -0.16 to 0.38, $p = 0.42$, $Q_w = 14.71$, $p < 0.01$, $I^2 = 73\%$

No differences in results of total cognition according to insight scale.

Relationship between cognitive insight (ability to evaluate symptoms as measured by the Beck Cognitive Insight Scale) and cognitive functioning

Significant, small associations between increased composite cognitive insight and increased total cognition, memory and executive functioning, but not IQ;

Total cognition: 5 studies, N = 299, $r = 0.18$, 95%CI 0.06 to 0.29, $p < 0.001$, $Q_w = 2.51$, $p = 0.64$, $I^2 = 0\%$

Memory: 5 studies, N = 299, $r = 0.21$, 95%CI 0.09 to 0.32, $p < 0.001$, $Q_w = 3.64$, $p = 0.46$, $I^2 = 0\%$

Executive functioning: 4 studies, N = 227, $r = 0.16$, 95%CI 0.02 to 0.29, $p = 0.03$, $Q_w = 3.22$, $p = 0.36$, $I^2 = 7\%$

IQ: 2 studies, N = 115, $r = 0.15$, 95%CI -0.14 to 0.42, $p = 0.32$, $Q_w = 2.01$, $p = 0.16$, $I^2 = 50\%$

Significant, small associations between reduced self-certainty and increased total cognition, memory and IQ, but not executive functioning;

Total cognition: 6 studies, N = 434, $r = -0.14$, 95%CI -0.25 to -0.04, $p = 0.01$, $Q_w = 6.15$, $p = 0.29$, $I^2 = 19\%$

Memory: 6 studies, N = 430, $r = -0.23$, 95%CI -0.32 to -0.13, $p < 0.001$, $Q_w = 4.70$, $p = 0.45$, $I^2 = 0\%$

IQ: 3 studies, N = 251, $r = -0.19$, 95%CI -0.31 to -0.07, $p < 0.001$, $Q_w = 0.26$, $p = 0.88$, $I^2 = 0\%$

Executive functioning: 5 studies, N = 363, $r = -0.02$, 95%CI -0.17 to 0.14, $p = 0.85$, $Q_w = 8.92$, $p =$



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<p>0.06, $I^2 = 55\%$</p> <p><i>No significant associations were found for any of the self-reflectiveness measures;</i></p> <p>Total cognition: 6 studies, N = 434, $r = 0.03$, 95%CI -0.07 to 0.12, $p = 0.56$, $Q_w = 1.30$, $p = 0.93$, $I^2 = 0\%$</p> <p>Memory: 6 studies, N = 430, $r = 0.06$, 95%CI -0.04 to 0.16, $p = 0.23$, $Q_w = 2.67$, $p = 0.75$, $I^2 = 0\%$</p> <p>IQ: 3 studies, N = 251, $r = -0.05$, 95%CI -0.20 to 0.11, $p = 0.55$, $Q_w = 2.88$, $p = 0.24$, $I^2 = 31\%$</p> <p>Executive functioning: 5 studies, N = 363, $r = -0.03$, 95%CI -0.14 to 0.07, $p = 0.53$, $Q_w = 1.85$, $p = 0.76$, $I^2 = 0\%$</p>	
Consistency	Consistent
Precision	Precise
Directness	Direct

Pijnenborg GHM, van Donkersgoed RJM, David AS, Aleman A

Changes in insight during treatment for psychotic disorders: A meta-analysis

Schizophrenia Research 2013; 114(1-3): 109-117

[View review abstract online](#)

Comparison	Improvements in insight with any treatment for schizophrenia vs. any control condition.
Summary of evidence	Moderate quality evidence (large sample, precise, inconsistent, indirect) suggests treatments for schizophrenia can improve insight, particularly if in combination with other treatments that target insight specifically.
Insight	
<p><i>A significant small to medium size effect of improved insight with any treatment compared to any control condition;</i></p> <p>19 RCT, N = 3,355, $d = 0.34$, 95%CI 0.12 to 0.57, $p = 0.003$, $I^2 = 85\%$, $p < 0.00001$</p> <p>There were no significant effects for individual treatments; CBT (5 RCTs, $d = 0.22$), psychoeducation (5 RCTs, $d = 0.42$), adherence therapy (3 RCT, $d = 0.26$), medication (1 RCT, $d = 0.08$), social skills training (1 RCT, $d = 0.09$), and video self-observation (2 RCTs, $d = 0.89$).</p>	



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Authors state that comprehensive intervention programs consisting of multiple components that target insight specifically may be the most promising.	
Consistency	Inconsistent
Precision	Precise
Directness	Indirect (varying treatments combined)

<p><i>Reinharth J, Reynolds G, Dill C, Serper M</i></p> <p>Cognitive predictors of violence in schizophrenia: a meta-analytic review</p> <p>Schizophrenia Research, Cognition 2014; 1: 1101-111</p> <p>View review abstract online</p>	
Comparison	<p>Association between aggression and insight in people with a psychotic disorder (inpatients or outpatients).</p> <p>85.9% of the sample had a diagnosis of a psychotic disorder; ~70% had schizophrenia or schizoaffective disorder.</p>
Summary of evidence	<p>High quality evidence (large sample, consistent, precise, direct) finds a small decreased risk of aggression with better insight.</p>
Aggression	
<p><i>Small, decreased risk of aggression with better insight;</i></p> <p>Insight: 5 studies, N = 2,422, OR = 0.72, 95%CI 0.61 to 0.86, $p < 0.05$, $I^2 < 50\%$, $p > 0.05$</p>	
Consistency in results	Consistent
Precision in results	Precise
Directness of results	Direct



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Subotnik KL, Ventura J, Hellemann GS, Zito MF, Agee ER, Nuechterlein KH

Relationship of poor insight to neurocognition, social cognition, and psychiatric symptoms in schizophrenia: A meta-analysis

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[View review abstract online](#)

Comparison	The relationship between insight and symptoms and cognition in people with schizophrenia.
Summary of evidence	Moderate quality evidence (large sample, mostly inconsistent, unable to assess precision, direct) finds a medium-sized association between poor insight (overall unawareness) and increased reality distortion, disorganised, and negative symptoms as well as poor cognition (social cognition, speed of processing, memory, learning, and problem solving).
Reality distortion	
<i>A medium-sized association between poor insight (overall unawareness) and increased reality distortion;</i>	
32 studies, N = 5,012, $r = 0.28$, 95%CI not reported, $p < 0.01$, $Qp < 0.01$ Removing five studies reduced heterogeneity and gave similar results ($r = 0.29$).	
Disorganised symptoms	
<i>A medium-sized association between poor insight (overall unawareness) and increased disorganised symptoms;</i>	
29 studies, N = 6,154, $r = 0.29$, 95%CI not reported, $p < 0.01$, $Qp < 0.01$ Removing three studies reduced heterogeneity and gave similar results ($r = 0.26$).	
Negative symptoms	
<i>A small to medium-sized association between poor insight (overall unawareness) and increased negative symptoms;</i>	
67 studies, N = 9,879, $r = 0.20$, 95%CI not reported, $p < 0.01$, $Qp < 0.01$ Removing 17 studies reduced heterogeneity and gave similar results ($r = 0.24$).	
Cognition	

Small effects showed more unawareness (insight) was associated with poorer;

Theory of mind: 12 studies, N = 1,069, $r = -0.23$, 95%CI not reported, $p < 0.01$, $Qp < 0.01$

Emotion processing: 6 studies, N = 2,328, $r = -0.12$, 95%CI not reported, $p < 0.01$, $Qp = 0.60$

Speed of processing: 31 studies, N = 2,516, $r = -0.10$, 95%CI not reported, $p < 0.01$, $Qp = 0.60$

Working memory: 26 studies, N = 2,410, $r = -0.10$, 95%CI not reported, $p < 0.01$, $Qp = 0.41$

Verbal learning & memory: 24 studies, N = 2,301, $r = -0.13$, 95%CI not reported, $p < 0.01$, $Qp < 0.01$

Visual learning & memory: 14 studies, N = 825, $r = -0.08$, 95%CI not reported, $p = 0.03$, $Qp = 0.19$

Reasoning problem solving: 37 studies, N = 2,835, $r = -0.09$, 95%CI not reported, $p < 0.01$, $Qp < 0.01$

There was no association with;

Attention/Vigilance: 14 studies, N = 1,437, $r = -0.04$, 95%CI not reported, $p = 0.11$, $Qp = 0.03$

Consistency in results	Inconsistent, apart from emotion processing, speed of processing, working memory, and visual learning and memory.
Precision in results	Unable to assess; no CIs reported
Directness of results	Direct

Explanation of acronyms

BPRS = Brief Psychiatric Rating Scale, CI = Confidence Interval, d = Cohen's d and g = Hedges' g = standardised mean differences (see below for interpretation of effect size), I^2 = the percentage of the variability in effect estimates that is due to heterogeneity rather than sampling error (chance), IQ = intelligence quotient, N = number of participants, p = statistical probability of obtaining that result ($p < 0.05$ generally regarded as significant), PANSS = Positive and Negative Syndrome Scale, Q = Q statistic for the test of heterogeneity, Q_w = test for within group differences (heterogeneity in study results within a group of studies – measure of study consistency), r = correlation coefficient, SAI-E = Schedule for Assessing the 3 components of insight-Expanded version, vs. = versus, WCST = Wisconsin Card Sorting Task

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Explanation of technical terms

* Bias has the potential to affect reviews of both RCT and observational studies. Forms of bias include; reporting bias – selective reporting of results; publication bias - trials that are not formally published tend to show less effect than published trials, further if there are statistically significant differences between groups in a trial, these trial results tend to get published before those of trials without significant differences; language bias – only including English language reports; funding bias - source of funding for the primary research with selective reporting of results within primary studies; outcome variable selection bias; database bias - including reports from some databases and not others; citation bias - preferential citation of authors. Trials can also be subject to bias when evaluators are not blind to treatment condition and selection bias of participants if trial samples are small¹⁴.

† Different effect measures are reported by different reviews.

Prevalence refers to how many existing cases there are at a particular point in time. Incidence refers to how many new cases there are per population in a specified time period. Incidence is usually reported as the number of new cases per 100,000 people per year. Alternatively some studies present the number of new cases that have accumulated over several years against a person-years denominator. This denominator is the sum of individual units of time that the persons in the population are at risk of becoming a case. It takes into account the size of the underlying population sample and its age structure over the duration of observation.

Reliability and validity refers to how accurate the instrument is. Sensitivity is the proportion of actual positives that are correctly identified (100% sensitivity = correct identification of all actual positives) and specificity is the proportion of negatives that are correctly identified (100% specificity = not identifying anyone as positive if they are truly not).

Weighted mean difference scores refer to mean differences between treatment and comparison groups after treatment (or occasionally pre to post treatment) and in a randomised trial there is an assumption that both groups are comparable on this measure prior to treatment. Standardised mean differences are divided by the pooled standard deviation (or the standard deviation of one group when groups are homogenous) that allows results from different scales to be combined and compared. Each study's mean difference is then given a weighting depending on the size of the sample and the variability in the data. Less than 0.4 represents a small effect, around 0.5 a medium effect, and over 0.8 represents a large effect¹⁴.

Odds ratio (OR) or relative risk (RR) refers to the probability of a reduction (< 1) or an increase (> 1) in a particular outcome in a treatment group, or a group exposed to a risk factor, relative to the comparison group. For example, a RR of 0.75 translates to a reduction in risk of an outcome of 25% relative to those not receiving the treatment or not exposed to the risk factor. Conversely, a RR of 1.25 translates to an increased risk of 25% relative to those not receiving treatment or not having been exposed to a risk factor. A RR or OR of 1.00 means there is no difference between groups. A medium effect is considered if $RR > 2$ or < 0.5 and a large effect if $RR > 5$ or < 0.2 ¹⁵. InOR stands for logarithmic OR where a InOR of 0 shows no difference between groups. Hazard ratios

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measure the effect of an explanatory variable on the hazard or risk of an event.

Correlation coefficients (eg, r) indicate the strength of association or relationship between variables. They can provide an indirect indication of prediction, but do not confirm causality due to possible and often unforeseen confounding variables. An r of 0.10 represents a weak association, 0.25 a medium association and 0.40 and over represents a strong association. Unstandardised (b) regression coefficients indicate the average change in the dependent variable associated with a 1 unit change in the independent variable, statistically controlling for the other independent variables. Standardised regression coefficients represent the change being in units of standard deviations to allow comparison across different scales.

‡ Inconsistency refers to differing estimates of effect across studies (i.e. heterogeneity or variability in results) that is not explained by subgroup analyses and therefore reduces confidence in the effect estimate. I^2 is the percentage of the variability in effect estimates that is due to heterogeneity rather than sampling error (chance) - 0% to 40%: heterogeneity might not be important, 30% to 60%: may represent moderate heterogeneity, 50% to 90%: may represent considerable heterogeneity and over this is considerable heterogeneity. I^2 can be calculated from Q (chi-square) for the test of heterogeneity with the following formula;¹⁴

$$I^2 = \left(\frac{Q - df}{Q} \right) \times 100\%$$

§ Imprecision refers to wide confidence intervals indicating a lack of confidence in the effect estimate. Based on GRADE recommendations, a result for continuous data (standardised mean differences, not weighted mean differences) is considered imprecise if the upper or lower confidence limit crosses an effect size of 0.5 in either direction, and for binary and correlation data, an effect size of 0.25. GRADE also recommends downgrading the evidence when sample size is smaller than 300 (for binary data) and 400 (for continuous data), although for some topics, these criteria should be relaxed¹⁶.

|| Indirectness of comparison occurs when a comparison of intervention A versus B is not available but A was compared with C and B was compared with C that allows indirect comparisons of the magnitude of effect of A versus B. Indirectness of population, comparator and/or outcome can also occur when the available evidence regarding a particular population, intervention, comparator, or outcome is not available and is therefore inferred from available evidence. These inferred treatment effect sizes are of lower quality than those gained from head-to-head comparisons of A and B.



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