



## Review

# Social cognition interventions for people with schizophrenia: a systematic review focussing on methodological quality and intervention modality



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## HIGHLIGHTS

- This is the first systematic review to compare modular and global intervention for social cognition.
- Both modular and global social cognition interventions are effective in improving theory of mind and affect recognition.
- There is insufficient evidence for benefit to social perception, attributional bias and functional outcomes.
- The evidence quality is limited by measure heterogeneity, modest study methodology and short follow-up periods.

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## ABSTRACT

**Background:** People with a diagnosis of schizophrenia have significant social and functional difficulties. Social cognition was found to influence these outcomes and in recent years interventions targeting this domain were developed. This paper reviews the existing literature on social cognition interventions for people with a diagnosis of schizophrenia focussing on: i) comparing focussed (i.e. targeting only one social cognitive domain) and global interventions and ii) studies methodological quality.

**Method:** Systematic search was conducted on PubMed and PsycInfo. Studies were included if they were randomised control trials, participants had a diagnosis of schizophrenia or schizoaffective disorder, and the intervention targeted at least one out of four social cognition domains (i.e. theory of mind, affect recognition, social perception and attribution bias). All papers were assessed for methodological quality. Information on the intervention, control condition, study methodology and the main findings from each study were extracted and critically summarised.

**Results:** Data from 32 studies fulfilled the inclusion criteria, considering a total of 1440 participants. Taking part in social cognition interventions produced significant improvements in theory of mind and affect recognition compared to both passive and active control conditions. Results were less clear for social perception and attributional bias. Focussed and global interventions had similar results on outcomes. Overall study methodological quality was modest. There was very limited evidence showing that social cognitive intervention result in functional outcome improvement.

**Conclusions:** The evidence considered suggests that social cognition interventions may be a valuable approach for people with a diagnosis of schizophrenia. However, evidence quality is limited by measure heterogeneity, modest study methodology and short follow-up periods. The findings point to a number of recommendations for future research, including measurement standardisation, appropriately powered studies and investigation of the impact of social cognition improvements on functioning problems.

## 1. Introduction

One of the main unresolved challenges in the treatment of schizophrenia is addressing functional problems. Whilst antipsychotic medications are considered effective in managing positive symptoms, these

treatments have only a modest impact on functioning difficulties (Swartz et al., 2007). Cognitive impairments in schizophrenia have been consistently identified as a treatment target because of their relevant to functioning (Carbon & Correll, 2014). Authors have argued that these represent a core aetiological feature of schizophrenia and

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may be as important as positive symptoms in predicting recovery (e.g. Kahn & Keefe, 2013). With current pharmacological interventions having a little effect on cognitive impairments, there is a clear need to develop effective treatments to tackle cognition (Cella, Reeder, & Wykes, 2015a; Murray et al., 2016; Reichenberg et al., 2014). Social cognition explains more functional outcome variance than basic cognition and has therefore been increasingly considered as an important treatment target promoting functional change in people with a diagnosis of schizophrenia (Fett et al., 2011; Green, Olivier, Crawley, Penn, & Silverstein, 2005).

Several studies have found marked deficits in social cognition in people with a diagnosis of schizophrenia when compared to healthy controls (e.g. Savla, Vella, Armstrong, Penn, & Twamley, 2013). Research also showed that problems in social cognition are directly associated with impaired functioning (Couture, Penn, & Roberts, 2006; Fett et al., 2011). This notion led to the development of interventions targeting social cognition problems. A meta-analysis of training programmes reported moderate to large effect sizes for interventions on specific social cognitive domains: affect recognition and theory of mind (Kurtz & Richardson, 2012). Smaller effects were found for social perception and attribution bias. This review also suggests, from a restricted and heterogeneous pool of studies, that social cognition interventions have a moderate effect on functional outcomes. A second review recently confirmed these results (Kurtz, Gagen, Rocha, Machado, & Penn, 2016). However the studies included in these reviews considered only broad-based social cognition interventions (i.e. those targeting more than one social cognition domain). These two reviews also did not systematically assess the included studies for methodological quality. Studies with modest methodological quality may not detect reliable effect sizes. Studies with low power are less reliable in their estimate of the intervention true effect and may increase the chance of false positives (Button et al., 2013). It is therefore important for systematic reviews to consider how studies methodological quality relates to outcomes.

Despite social cognition interventions having the same overarching aim, there is substantial variability in format, implementation methods and therapy modalities. Some target multiple social cognition domains, (e.g. Social Cognitive Interaction Training, Combs et al., 2007, Penn, Roberts, Combs, & Sterne, 2007), while others selectively target only one domain (e.g. Targeted Theory of Mind program, Bechi et al., 2013). Some interventions are administered in a group format while many targeted interventions are delivered individually (e.g. Combs et al., 2007; Corrigan, Hirschbeck, & Wolfe, 1995). A number of interventions are administered by computer software (e.g. Sachs et al., 2012), while others are led by therapists (e.g. Taylor et al., 2015). In addition, programme length varies substantially, with some requiring as little as one session (e.g. Corrigan et al., 1995) while others last for over two years (e.g. Eack et al., 2009). The diversity in intervention modalities and delivery methods provides options for clinicians. However, at present there is limited understanding about which programmes should be selected. The study by Kurtz et al. (2016) excluded targeted interventions whilst previous reviews included these (Horan, Kern, Green, & Penn, 2008). One of the strengths of this review is the inclusion of both targeted and broad-based interventions, allowing investigation of how training in specific social cognition domains may influence others.

With many differences being specific of global or targeted programs it seems that comparing these two intervention clusters may highlight effective elements. Previous reviews in this area have not used systematic methods to evaluate study quality. It is likely that studies with poorer methodology may have over inflated results, or are subject to type II error due to insufficient power to reliably detect an effect size. Further, this review investigated both targeted and broad-based interventions. It is plausible that beneficial effects from one area (such as theory of mind) may transfer to other areas of social cognition or may exert a positively impact functioning. In addition, focussed interventions are easier to administer as they are often delivered in a one to one

format so can be used in settings where groups are not viable, for example with patients with social anxiety. Focussed interventions can also be included as part of a stepped-care approach and therefore may be relevant to low-intensity services. The consideration of focussed intervention studies will inform clinical practice where short-term and cost-effective interventions are highly valued.

This paper systematically reviews the current status of social cognition interventions, with particular reference to the issues that will be instrumental in evaluating their efficacy: methodological quality and intervention type. This review will also report on the effects of social cognition interventions on functioning outcomes to characterise the extent to which social cognitive change may impact people's everyday life functioning. Investigating these areas will provide a timely reflection on the status of social cognition intervention research and help direct future research towards areas where evidence is lacking or needs consolidation.

## 2. Methods

This systematic review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Moher, Liberati, Tetzlaff, Altman, & Group, 2009) (see Appendix B for the PRISMA checklist).

### 2.1. Data sources and search terms

Systematic searches were conducted up to May 2016 using PsycInfo and PubMed databases. The following search terms were used as keywords: ("Social cogn\*" OR "Training" OR "Rehabilitation" OR "Remediation") AND ("Schizo\*" OR "Psychotic" OR "Psychosis"). Only studies including human participants and those written in English were included. We also inspected the reference list of the included papers and relevant reviews (Fiszdon & Reddy, 2012; Kurtz & Richardson, 2012; Kurtz et al., 2016) to identify any additional relevant papers. Fig. 1 shows the selection process.

### 2.2. Study inclusion criteria

The inclusion criteria were: (a) randomised controlled trials including a social cognition intervention and a comparison group (e.g. treatment as usual or active control group); (b) participants were aged 18 to 65 years with a diagnosis of schizophrenia or schizoaffective disorder, according to the Diagnostic and Statistical Manual of Mental Disorder (Mendelson, 1995), Research Diagnostic Criteria (Spitzer, Endicott, & Robins, 1978) or International Classification of Diseases (Uribe, 1996); (c) the intervention targeted one or more social cognition domains. These are defined as theory of mind, affect recognition, attributional style and social perception. (d) If combined with other interventions targeting different outcomes (e.g. cognition), the social cognition intervention accounted for > 50% of the therapy time.

### 2.3. Procedures and data extraction

Initially, titles and abstracts were screened to identify eligible studies by two authors independently (NG and ML). Full text articles were obtained for all the studies considered eligible on the bases on the abstract screening and further reviewed for eligibility. Any disagreements were resolved with discussion with a third author (MC). From each included paper we extracted: participant number and demographic characteristics, details of the intervention (e.g. group/individual, duration), nature of the control group, social cognition outcomes and functioning outcomes. The results were grouped by four social cognition domains: affect recognition; theory of mind; social perception, attribution bias and also functional outcome. We considered studies describing treatment effect only when the interaction term was reported (i.e. group [treatment vs control] x time [pre and

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