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Do trauma-focussed psychological interventions have an effect on psychotic symptoms? A systematic review and meta-analysis

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ABSTRACT

There is growing recognition of the relationship between trauma, posttraumatic stress disorder (PTSD) and psychosis. There may be overlaps in casual mechanisms involved in the development of PTSD and psychosis following traumatic or adverse events. Trauma-focussed treatments found to be effective in treating PTSD may therefore represent a new direction in the psychological treatment of psychosis. This systematic review examined the literature on trauma-focussed treatments conducted with people with schizophrenia spectrum or psychotic disorders to determine effects on psychotic symptoms. Secondary outcomes were symptoms of PTSD, depression and anxiety. Twenty-five studies were included in the review, with 12 being included in the meta-analysis. Trauma-focussed treatments had a small, significant effect ($g = 0.31$, CI [0.55, 0.06]) on positive symptoms immediately post-treatment, but the significance and magnitude of this effect was not maintained at follow-up ($g = 0.18$, CI [0.42, −0.06]). Trauma-focussed treatments also had a small effect on delusions at both post-treatment ($g = 0.37$, CI [0.87, −0.12]) and follow-up ($g = 0.38$, CI [0.67, 0.10]), but this only reached significance at follow-up. Effects on hallucinations and negative symptoms were small and non-significant. Effects on PTSD symptoms were also small (post-treatment $g = 0.21$, CI [0.70, −0.27], follow up $g = 0.31$, CI [0.62, 0.00]) and only met significance at follow-up. No significant effects were found on symptoms of depression and anxiety. Results show promising effects of trauma-focussed treatments for the positive symptoms of psychosis, however further studies developing and evaluating trauma-focussed treatments for trauma-related psychotic symptoms are needed.

1. Introduction

There is mounting evidence that exposure to traumatic or adverse experiences in childhood represents a significant risk factor in the development of psychosis (Bendall et al., 2008; Read et al., 2001; Varese et al., 2012) and there is thematic correspondence between the content of psychotic experiences and significant past life events (Corstens and Longden, 2013; Hardy et al., 2005; McCarthy-Jones et al., 2014). There is also compelling evidence to suggest a relationship between posttraumatic stress disorder (PTSD, arguably the 'hallmark' disorder caused by traumatic events) and psychosis, including high rates of comorbidity (Sareen et al., 2005) and PTSD being a risk factor for the development of psychosis (Okkels et al., 2017).

This relationship suggests similar mechanisms could be involved in psychotic experiences and symptoms of PTSD (Morrison et al., 2003). For example, it has been proposed that auditory hallucinations are a type of posttraumatic intrusion, contributed to by contextual processing difficulties (Hardy, 2017; Steel et al., 2005). Additionally, dissociation (Moskowitz and Corstens, 2007) and negative posttraumatic beliefs (Gracie et al., 2007) have been implicated in the development of auditory hallucinations. Similar psychological mechanisms are also implicated in the development of delusional experiences and PTSD symptoms following a traumatic event (Freeman et al., 2013), whilst negative symptoms have been conceptualized as manifestations of trauma-related avoidance (McGorry, 1991).

Trauma-focussed (TF) interventions are effective in treating PTSD (Bisson et al., 2007). Given potential mechanistic overlaps between PTSD and psychosis TF treatments represent a new direction in treatment development for psychosis. This aligns with mental health service-user calls for therapeutic approaches that consider psychosis in the context of past life experiences (Corstens et al., 2014). Recently, researchers have begun to apply TF treatments to comorbid PTSD and other trauma-related symptoms in people with psychotic disorders. Whilst evidence remains too limited for a Cochrane review to draw

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Table 1
Inclusion and exclusion criteria.

Inclusion criteria	Exclusion criteria
Studies of participants with psychosis (defined by a psychiatric diagnosis of a schizophrenia spectrum disorder or psychotic disorder OR scores above clinical cutoff for hallucinations, delusions or negative symptoms on validated clinical interviews or measures)	Studies with non-clinical samples
Controlled or uncontrolled treatment studies with quantitative outcome data derived from psychometrically validated measures.	Studies without quantitative outcome data or from which quantitative data are derived from scales which are not psychometrically validated
Studies testing trauma-focussed treatments with an evidence base for PTSD as outlined in the Australian Guidelines for the treatment of PTSD (*Australian Guidelines for the Treatment of Acute Stress Disorder and Posttraumatic Stress Disorder*, 2013) (and defined in this review as any psychological therapy that predominantly uses trauma-focussed cognitive-behavioural techniques and including EMDR, prolonged exposure, trauma focussed cognitive therapy, trauma focussed CBT, and cognitive processing therapy)[a]	Studies using non trauma-focussed treatments (i.e. those which do not discuss the content or themes of the index traumatic event(s) during the treatment)

[a] Note: we chose to include any study using trauma-focussed treatments to treat post-traumatic symptoms in people with psychosis, irrespective of PTSD diagnosis or index trauma.

any meaningful conclusions (Sin et al., 2017), two recent reviews have concluded that TF treatments can be used safely and effectively reduce PTSD symptoms in this population (Sin and Spain, 2016; Swan et al., 2017). Emerging data also suggests that TF treatments may have an impact on psychotic symptoms, but this is yet to be systematically synthesized across studies. We examined the literature on TF treatments conducted within psychosis populations to determine whether these interventions have an effect on psychotic symptoms.

2. Methods

The review was prospectively registered with the International Prospective Register of Systematic Reviews (PROSPERO), protocol no: CRD42016035827 and is reported in accordance with PRISMA guidelines.

2.1. Eligibility criteria

Table 1 outlines the eligibility criteria used.

2.2. Information sources

Literature searches were conducted using five databases: PsycINFO, PubMed, EMBASE, CINAHL, and The Cochrane Library. In addition, the WHO international clinical trials registry platform and references of included articles were searched.

2.3. Search terms

The search strategy involved: 1) terms relating to schizophrenia spectrum or psychotic disorders, and 2) terms relating to TF psychological interventions. Literature was searched from the inception of the databases until 25th March 2016. Articles were required to be in English.

2.4. Study selection

Record titles and abstracts were screened for inclusion by one author. Full text records were assessed for inclusion independently by two authors, with 83% agreement. Discrepancies were resolved in discussion with a third author.

2.5. Data collection process and data items

The following data were extracted from each study: 1) study design, 2) intervention and comparison, 3) participant characteristics, 4) treatment format, 5) therapist characteristics, 6) primary outcomes, 7) secondary outcomes, 8) treatment retention, and, 9) main results.

2.6. Risk of bias in individual studies

Risk of bias was assessed independently by two authors (83% initial agreement) using The Cochrane Collaboration tool (Higgins et al., 2011a), rating each study as 'low', 'high', or 'unclear' risk for the following criteria; 1) random sequence generation, 2) allocation sequence concealment, 3) masking, 4) incomplete outcome data, and 5) selective reporting. Uncontrolled studies automatically received a 'high risk' rating on criteria 1–3.

2.7. Synthesis of results

Uncontrolled and controlled studies were subject to meta-analytic synthesis using Comprehensive Meta-analysis 3.0. Primary outcomes were the severity of positive and negative symptoms of psychosis, and specifically hallucinations and delusions.[1] Secondary outcomes were PTSD, depression and anxiety symptom severity. A decision to use random effect models was made a-priori, given the anticipated heterogeneity of study interventions and designs. Hedges g was used to calculate effect sizes. Analyses were conducted to calculate both pre-post treatment effects (across all studies), and between-groups treatment effects (in randomised controlled trials only). Pre-post treatment effect sizes were calculated using change scores, with standard deviations of change scores as the denominator. Since repeated measures correlations were not available, a correlation of 0.7 was imputed, as suggested by Rosenthal (1993). Between-group effect sizes were calculated using posttest means and pooled standard deviations. Where means and standard deviations were not available, effect sizes were calculated using other data. Heterogeneity of results was analysed using the I^2 statistic.

Three studies had a 'severe mental illness' sample, including participants without psychosis (Mueser et al., 2007; Mueser et al., 2015; Mueser et al., 2008). The authors of these studies either provided disaggregated means and standard deviations for the psychosis subgroup or access to their raw data. Linear mixed models provided intent-to-treat estimated marginal means from this raw data. Analyses were conducted for two time points, post-treatment and follow-up (including any follow-ups conducted between one and six months following treatment). For studies that included more than one follow-up in this timeframe, the time-points were pooled using the method described by Borenstein et al. (2009). Positive symptom scores were taken from positive scale scores of the Positive and Negative Syndrome Scales or Brief Psychiatric Rating Scales, or, when only separate measures of hallucinations and delusions were available, by pooling available positive symptom scores into a single variable, also using the Borenstein et al. (2009) method.

[1] Our original intention was to measure hallucinations, delusions and negative symptoms as primary outcomes, as outlined in the PROSPERO protocol. On collation of the results it became clear that the measurement of hallucinations and delusions was more commonly reflected in an aggregate measure of positive symptoms. A decision was therefore made to include positive symptoms as a primary outcome.

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