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#### Review

## Psychological mediators of the association between childhood adversities and psychosis: A systematic review



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#### HIGHLIGHTS

- A growing number of studies has examined potential mediators of the relationship between childhood adversity and psychosis.
- The childhood adversity-psychosis link appears to be mediated by five "families" of mediators.
- Evidence indicates that post-traumatic sequalae, affective dysregulation, and maladaptive cognitive factors mediate the link,
- Evidence for other plausible mediators (e.g. substance misuse) is more tentative or inconclusive.

#### ARTICLE INFO

# Keywords: Psychosis Trauma Early adversities Psychological mechanisms Mediation

#### ABSTRACT

*Objectives*: This is the first review to identify, summarise and critically evaluate studies that examined psychological mediators of the relationship between childhood adversities and psychosis.

*Methods*: A database search (PsychINFO, MEDLINE, Web of Science, CINAHL) was conducted to identify eligible studies published between January 1980 and September 2017. A narrative synthesis and appraisal of methodological quality and statistical appropriateness of the primary studies was conducted.

Results: We identified 37 papers, comprising 9057participants with psychotic disorders and 63,059 non-clinical participants. Despite great variation in the mediators considered and the methodological and analytic quality of the primary studies, our synthesis suggests that the relationship between childhood adversity and psychosis is mediated by several "families" of mediating variables including post-traumatic sequelae (e.g. dissociation, PTSD symptoms), affective dysfunction and dysregulation, and maladaptive cognitive factors (e.g. self-esteem and beliefs and concepts about the self and others). More tentative evidence was observed for the role played by appraisals of subsequent circumstantial factors (e.g. "life hassles"). Substance misuse was not found to be a prominent mediator of the relationship between childhood adversity and psychotic experiences, but further high quality corroborative studies are required.

Conclusions: The importance of the five different (but not independent or mutually exclusive) families of mediators considered by the present evidence synthesis should be examined by future research employing appropriate modelling methods to better disentangle the contribution of these different processes. Nonetheless, they represent potentially valuable intervention targets that clinicians should consider whilst developing treatment plans for trauma survivors with distressing psychotic symptoms.

#### 1. Introduction

The risk of developing psychosis has been linked to a range of adverse life experiences and circumstances, including poverty, discrimination, unemployment and war traumas (Read, Fink, Rudegeair, Felitti, & Whitfield, 2008). However, particular interest has been given

to the relationship between psychosis and exposure to potentially traumatic life events in childhood to identify the impact of socio-environmental precursors to psychosis. Within the literature, the term "childhood adversity" has been used to describe exposure to a range of potentially harmful experiences during childhood and adolescence that may lead to a range of adverse long-term health and mental health

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outcomes (Varese et al., 2012). The types of adversity that have been most extensively examined in the context of psychosis research include physical, sexual or emotional abuse, neglect, the harmful effects of bullying, and parental loss or separation (e.g. Varese et al., 2012; Matheson, Shepherd, Pinchbeck, Laurens, & Carr, 2013; Velthorst et al., 2013; Read, van Os, Morrison, & Ross, 2005; Morgan & Gayer-Anderson, 2016). These potentially traumatic experiences have been shown to contribute to both the emergence and maintenance of psychotic symptoms in the general population (e.g. Bebbington, 2009) and in the development of psychotic disorders more specifically (Varese et al., 2012; Velthorst et al., 2013; Read, van Os, Morrison, & Ross, 2005).

Several meta-analytic studies suggest that exposure to potentially traumatic events in childhood increases the risk of developing psychosis (e.g. Matheson, Shepherd, Pinchbeck, Laurens, & Carr, 2013; Varese et al., 2012). There is evidence that this relationship follows a doseresponse pattern (i.e. the greater the number of exposures, the stronger the relationship with psychosis outcomes; e.g. Janssen et al., 2004; Shevlin, Dorahy, & Adamson, 2007). Furthermore, the evidence for an association between childhood adversities and psychosis is not only supported by a multitude of cross-sectional retrospective studies, but also by numerous longitudinal investigations (e.g. Poulton et al., 2007; Varese et al., 2012). However, while these are important indicators of potentially causal relationships, in themselves these findings cannot ascertain causality (Bentall & Varese, 2012). For example, Austin Bradford Hill (1965) proposed nine criteria to support evidence of a causal relationship in observational research. The criteria (known as the Bradford Hill criteria) include strength, consistency, dose-response, specificity, consideration of alternative explanations, experimental evidence, and plausibility, the latter referring to the identification of a plausible mechanism that could explain the observed relationship between a putative risk factor and the health outcome under scrutiny. Historically, causal inference has been approached with the assumption of a single-factor direct relationship (i.e. A causes B), but researchers now understand that many health and illness outcomes are a result of the interplay between multiple contributing and mediating mechanisms (Fedak, Bernal, Capshaw, & Gross, 2015). An increasing number of studies have attempted to elucidate potential mediating mechanisms, including psychological processes, which may explain how childhood adversities exert their influence on the development and maintenance of psychotic symptoms (Morgan & Gayer-Anderson, 2016). Although the variables that can be regarded as "psychological mechanisms" can vary greatly in the literature, investigators in this research area have often used this term to describe cognitive process in the domains of attention, memory, imagery, thinking/reasoning and behaviour (in line with broader definitions provided, amongst others, by Harvey, Watkins, Mansell, & Shafran, 2004), as well as affective symptoms (e.g. Garety, Kuipers, Fowler, Freeman, & Bebbington, 2001).

There are multiple potential pathways to psychosis, with prominent models of psychosis hypothesising different psychological mechanisms to explain the relationship between childhood trauma and psychosis vulnerability or distress maintenance. These include negative schematic models of the self and the world and disrupted affect (Garety, Kuipers, Fowler, Freeman, & Bebbington, 2001), stress-sensitivity (Myin-Germeys & van Os, 2007), the impact of trauma via the developing brain (Read, Perry, Moskowitz, & Connolly, 2001), attachment (Barker, Gumley, Schwannauer, & Lawrie, 2015; Berry & Bucci, 2016), dissociation (Berry & Bucci, 2016; Longden, Madill, & Waterman, 2012; Pilton, Varese, Berry, & Bucci, 2015), self-monitoring abnormalities (Feinberg, 1978; Waters et al., 2012), source monitoring difficulties (Bentall, 1990; Brookwell, Bentall, & Varese, 2013); cognitive appraisals (Chadwick & Birchwood, 1994, 1996; Morrison, 1998, 2001) and peri- and post-traumatic processes (e.g. Hardy et al., 2016; Steel, 2015).

Progress in statistical techniques has enabled researchers to examine the putative mechanisms linking childhood adversity to psychosis with growing levels of methodological and analytic rigor. For

example, mediation analysis is a statistical method used to help identify mechanisms by which an exposure influences an outcome of interest. The statistical approach of mediation analysis enables the disentanglement and elucidation of the various pathways of direct and indirect effects that play a role in the relationship between exposures and observable outcomes (Hayes, 2013). Identification of psychological mediators is one of the most widely examined questions in psychological research; however, this analytic approach has only been recently applied to the investigation of the relationship between exposure to potentially traumatic events in childhood and psychosis (Read, Fink, Rudegeair, Felitti, & Whitfield, 2008). Identification of psychological mediators can help to ascertain whether the observed relationship between childhood trauma and psychosis may be regarded as a causal one, and inform targeted preventative interventions and the development of more effective treatments for distressing psychotic experiences. Mediation analysis enables a formal quantification and inferential test of plausible theoretical mechanisms (Hayes, 2013) and, therefore, offers a more robust test of whether an inferential procedure justifies a claim for plausible mechanisms rather than relying on outcomes of a set of hypothesis tests about the relationship between exposures and observable outcomes. Hence, a review of rigorously tested psychological mediators of the link between trauma and psychosis has the potential to support the development of empirically supported models of psychosis vulnerability and maintenance, and provides a platform for ensuring that psychological interventions target the most promising mechanisms, therefore leading to improved treatment outcomes.

Although other reviews of the literature on mechanisms linking trauma and psychosis have appeared in recent years (e.g. Bentall et al., 2014; Morgan & Gayer-Anderson, 2016), these did not employ systematic approaches to retrieve and appraise the available empirical literature, and their conclusion may therefore incur considerable bias. The current review addresses this significant gap in the evidence base, and provides a systematic review and synthesis of the empirical literature for the proposed psychological mechanisms of the childhood adversity-psychosis relationship, considering the robustness of the statistical mediation methods employed. Specific aims are to: 1) provide a comprehensive systematic review of quantitative literature investigating potential psychological mediators examining the link between childhood adversity (i.e. physical, psychological, sexual and emotional abuse, neglect and bullying) and psychosis; 2) evaluate the quality of this evidence, including the relative strength of the statistical mediation analysis used to explain the adversity-psychosis link.

#### 2. Method

#### 2.1. Search procedure

The current review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Moher & Liberati, 2009). Methods of the analysis and inclusion criteria were specified in advance and documented in a protocol registered with PROSPERO (PROSPERO registration: 42016047842). A systematic search of PsycINFO, MEDLINE, Web of Science and CINAHL was conducted using the following search strings: (voices OR psychosis OR psychotic OR schizo\* OR hallucination OR delusion) AND (child abuse OR physical abuse OR psychological abuse OR emotional abuse OR neglect OR trauma OR advers\* OR maltreat\* OR bully\*). The search terms followed closely those of previously published meta-analyses of the relationship between childhood adversity and severe mental health difficulties (Palmier-Claus, Berry, Bucci, Mansell, & Varese, 2016; Varese et al., 2012). Examination of reference lists of eligible studies and a forward search was carried out in addition to the database search.

#### 2.2. Inclusion and exclusion criteria

Eligible studies were empirical studies published in peer reviewed

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