Metacognitive beliefs in the at-risk mental state: A systematic review and meta-analysis

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ABSTRACT

Dysfunctional metacognitive beliefs are common among people with psychosis. In this meta-analysis we examined whether these are also present in people meeting at-risk mental state (ARMS) criteria. We also explored the relationship between metacognitive beliefs and symptoms in the ARMS group. An electronic database search of Ovid MEDLINE, PsycINFO and Embase from inception until August 2016 was conducted using keyword search terms synonymous with ARMS and metacognition. Eligible studies were original research articles that examined metacognitive beliefs using the Metacognitions Questionnaire (MCQ) among people meeting ARMS criteria. Studies included in the meta-analyses also reported comparison MCQ data acquired from healthy controls, help-seeking individuals, or people with psychotic disorders. Eleven eligible studies were identified, reporting data from six unique ARMS samples. People with ARMS did not differ from those with established psychotic disorders on any MCQ subscale, but they reported significantly more dysfunctional metacognitive beliefs than healthy or help-seeking controls. Maladaptive metacognitive beliefs were associated with a range of symptoms in ARMS individuals, but evidence for associations with specific subthreshold psychotic phenomena was inconsistent. This evidence indicates how valuable assessment and treatment of dysfunctional metacognitive beliefs may be but suggests that specific aspects of methodology should be addressed.

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1. Introduction

Metacognition has been broadly defined as 'thinking about thinking' (Flavell, 1979), and includes the processes involved in the control, modification and interpretation of thought (Wells & Cartwright-Hatton, 2004). Certain metacognitive beliefs have been proposed to contribute to the development and maintenance of a range of mental health problems, including anxiety disorders (Ellis & Hudson, 2010; Hezel & McNally, (2015); Wells, 1995), alcohol abuse (Spada, Zandvoort, & Wells, 2007), eating disorders (Olstad, Solem, Hjemdal, & Hagen, 2015) and depression (Papageorgiou & Wells, 2003).

Much of the research into the relationship between maladaptive metacognitive beliefs and psychopathology has been based on the self-regulatory executive function (S-REF) model proposed by Wells and Matthews (1996). This was originally developed to account for

processes underlying affective disorders and refers to a cognitive-attentional syndrome in which heightened self-focused attention, reduced efficiency of cognitive functioning and repetitive rumination drive psychological dysfunction. Preoccupation with thoughts results in the depletion of resources needed to process information incompatible with dysfunctional beliefs. It also primes similar dysfunctional beliefs and makes the individual more sensitive to internal and external belief-congruent information.

The most commonly used tools for assessing metacognitive beliefs are the Metacognitions Questionnaire (MCQ) (Cartwright-Hatton & Wells, 1997) and Metacognitions Questionnaire - short form (MCQ-30) (Wells & Cartwright-Hatton, 2004). Based on the S-REF model, these self-report scales assess five dimensions of dysfunctional metacognitive beliefs originally derived using factor analyses; (1) 'positive beliefs about worry', which includes items suggesting worrying is beneficial for avoiding problems, remaining organised and helping one to cope; (2) 'negative beliefs about uncontrollability of thoughts and corresponding danger', which includes items emphasising the importance of controlling one's thoughts and potential mental and physical dangers associated

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with not doing so; (3) 'cognitive confidence', which includes items concerned with perceived lack of self-confidence in one's memory and attention; (4) 'negative beliefs about thoughts in general', which is based around themes of superstition and punishment and includes items relating to the potential outcome of thoughts and feelings of responsibility for preventing those outcomes; (5) 'cognitive self-consciousness', which includes items reflecting one's tendency to be aware of and monitor one's thinking. Participants score individual items on a 4-point Likert scale based on the strength of their agreement with each statement. Relevant items are then summed to provide subscale scores for each of the five factors, with higher scores indicating more dysfunctional beliefs.

High levels of dysfunctional metacognitive beliefs are reported among people with psychotic disorders (Sellers et al., 2016). These have been proposed to play a potential role in the onset and persistence of psychotic symptoms such as hallucinations and delusions (Morrison, 2001; Morrison, Wells, & Nothard, 2000; 2011). Positive beliefs about psychotic symptoms (for example that suspiciousness is good and keeps an individual safe) are argued to contribute to more frequent and severe symptoms, whereas negative beliefs about these thoughts (such as that they are uncontrollable or dangerous) are posited to lead to distress (Morrison, 2001; Morrison et al., 2015).

Over the past two decades, criteria have been developed to identify individuals vulnerable to developing a psychotic disorder (Miller et al., 2002; Yung et al., 1996; 2003). These have been referred to as the prodromal, ultra-high risk (UHR), clinical high-risk (CHR) and at-risk mental state (ARMS) criteria (Fusar-Poli et al., 2013). Recent estimates suggest approximately 36% of this group will go on to develop a psychotic disorder over the following 3 years (Fusar-Poli et al., 2012a), though people continue to be at risk of transition upwards of ten years after initially presenting to clinical services (Nelson et al., 2013). In addition, young people with ARMS frequently present with, or go on to develop, high rates of mood and anxiety disorders (Addington et al., 2011; Fusar-Poli, Nelson, Valmaggia, Yung, & McGuire, 2014; Lin et al., 2015). Maladaptive metacognitive beliefs are therefore a potentially relevant target for clinical intervention for a range of mental health problems in this population. However, no reviews to our knowledge have examined metacognitive dysfunction in the ARMS group. Reducing both psychiatric symptom severity and associated distress may ultimately lead to reduced vulnerability to both psychotic and non-psychotic clinical outcomes.

The aim of this review was to examine whether young people with ARMS report more maladaptive metacognitive beliefs compared with healthy controls, help-seeking individuals who do not meet ARMS criteria, and people diagnosed with psychotic disorders. We also sought to examine the relationship between metacognitive beliefs and clinical symptoms in the ARMS group.

2. Method

This review was conducted in line with the PRISMA guidelines for reporting systematic reviews and meta-analyses (Moher, Liberati, Tetzlaff, Altman, & PRISMAGroup, 2009).

2.1. Eligibility criteria

Studies eligible for inclusion in the narrative synthesis were original research articles that examined metacognitive beliefs using the MCQ or MCQ-30 among people meeting ARMS criteria (Fusar-Poli et al., 2013). In order to be included in the meta-analyses, studies also needed to report additional MCQ comparison data acquired from healthy controls, help-seeking individuals who did not meet ARMS criteria or people diagnosed with a full-threshold psychotic disorder. Studies that included only subjects at genetic risk who had not met formal ARMS criteria, case studies and review articles were ineligible. No language restrictions were placed on articles for inclusion.

2.2. Search strategy

On 1st August 2016 we conducted an electronic database search of Ovid MEDLINE, PsycINFO and Embase (from inception) using the following keyword search terms: "metacogniti*" and "at risk mental state" or "ultra high risk" or "UHR" or "clinical high risk" or "CHR" or "prodrom*" and "psychosis" or "psychotic" or "schizophrenia". In addition, a basic search of Google Scholar was conducted, recent conference abstracts were screened, authors were contacted for unpublished data and the reference lists of retrieved articles were also reviewed to identify any additional eligible studies.

2.3. Study selection and data extraction

Two reviewers (J.C. and R.C.) independently screened articles for eligibility. For all eligible studies, a data extraction spreadsheet was used to record: (1) study characteristics (year of publication, country where the work was performed); (2) sample demographics (sample size, gender composition, mean age); (3) the screening instrument used to assess ARMS status; (4) metacognitive data (MCQ measure used, mean sample scores for each subscale); (5) summary of study findings.

2.4. Statistical analyses

Meta-analyses were performed to examine group differences in metacognitive beliefs based on the five factors derived from the MCQ. Separate analyses were performed to examine differences between (1) ARMS and healthy controls; (2) ARMS and people with psychotic disorders; (3) ARMS and help-seeking individuals who did not meet ARMS criteria. Data analyses were performed using Comprehensive Meta-Analysis version 3.0 (Borenstein, Hedges, Higgins, & Rothstein, 2007). Standardised mean differences (effect sizes) were calculated for each of the five MCQ subscales using Hedges' g. A random-effects model was applied throughout, better accounting for observed heterogeneity. Estimates are more conservative but such models perform better than fixed-effect approaches (Brockwell & Gordon, 2001). Heterogeneity was quantified using the Q-test and I^2 statistic.

3. Results

3.1. Eligible studies

The study selection process is summarised in Fig. 1. We identified eleven papers eligible for inclusion in the narrative synthesis, collectively reporting data obtained from six unique ARMS samples (due to multiple publication) (Table 1). The meta-analyses included data from each of these six samples: metacognitive beliefs in five ARMS samples were compared to healthy controls (Brett, Johns, Peters, & McGuire, 2009; Leicester, 2013; Morrison, French, & Wells, 2007, 2006; Taylor, 2010; Welsh, Cartwright-Hatton, Wells, Snow, & Tiffin, 2014), in three samples were compared to people diagnosed with a psychotic disorder (Brett et al., 2009; Morrison et al., 2007, 2006; Taylor, 2010), and two to help-seeking individuals who did not meet ARMS criteria (Barbato et al., 2014; Taylor, 2010). Metacognitive data acquired at baseline from the Early Detection and Intervention Evaluation (EDIE) trial was used in a series of publications. In the meta-analyses we included data from