



Contents lists available at ScienceDirect

Schizophrenia Research

journal homepage: www.elsevier.com/locate/schres

Dimensions of insight in schizophrenia: Exploratory factor analysis of items from multiple self- and interviewer-rated measures of insight

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ARTICLE INFO

Article history:

Received 23 August 2017

Received in revised form 6 January 2018

Accepted 25 February 2018

Available online xxxxx

Keywords:

Schizophrenia

Awareness of illness

Clinical insight

Cognitive insight

Factor analysis

Latent variable model

ABSTRACT

Objective: Insight in schizophrenia is regarded as a multidimensional construct that comprises aspects such as awareness of the disorder and recognition of the need for treatment. The proposed number of underlying dimensions of insight is variable in the literature. In an effort to identify a range of existing dimensions of insight, we conducted a factor analysis on combined items from multiple measures of insight.

Method: We recruited 165 participants with enduring schizophrenia (treated for >3 years). Exploratory factor analysis was conducted on itemized scores from two interviewer-rated measures of insight: the Schedule for the Assessment of Insight-Expanded and the abbreviated Scale to assess Unawareness of Mental Disorder; and two self-report measures: the Birchwood Insight Scale and the Beck Cognitive Insight Scale.

Results: A five-factor solution was selected as the best-fitting model, with the following dimensions of insight: 1) awareness of illness and the need for treatment; 2) awareness and attribution of symptoms and consequences; 3) self-certainty; 4) self-reflectiveness for objectivity and fallibility; and 5) self-reflectiveness for errors in reasoning and openness to feedback.

Conclusions: Insight in schizophrenia is a multidimensional construct comprised of distinct clinical and cognitive domains of awareness. Multiple measures of insight, both clinician- and self-rated, are needed to capture all of the existing dimensions of insight. Future exploration of associations between the various dimensions and their potential determinants will facilitate the development of clinically useful models of insight and effective interventions to improve outcome.

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1. Introduction

In schizophrenia, insight is regarded as a multidimensional construct that comprises aspects such as awareness of the disorder and recognition of the need for treatment. Previous studies estimate that 50% to 80% of patients with schizophrenia are at least partially unaware of their illness (Amador and Gorman, 1998). Poor insight has significant prognostic and therapeutic consequences for outcome, including poor medication adherence (Lacro et al., 2002), greater frequency of hospitalizations and relapses (Drake et al., 2007), poor social and vocational functioning (Francis and Penn, 2001; Lysaker et al., 2002), and increased severity of symptoms (Mintz et al., 2003). The etiology of poor insight in schizophrenia remains unclear, which presents a major obstacle to the development of effective interventions (Amador and Kronengold, 2004; Markova and Berrios, 1995; Vohs et al., 2016).

In our view, one of the biggest barriers to understanding insight in schizophrenia is the variability in the number of proposed underlying dimensions. Studies have employed diverse measures that examine different dimensions of insight and may not overlap in content. A lack of proper training and establishment of interrater reliability also contribute to variability in insight assessment. Furthermore, some studies use clinician-rated scales while others use self-report measures, which makes comparisons difficult and does not capture both perspectives (Markova and Berrios, 1995). While the VAGUS insight into psychosis scale (Gerretsen et al., 2014) addresses the latter issue by including self-report and clinician-rated versions that assess multiple dimensions of clinical insight, it does not measure any aspects of cognitive insight, or the ability to properly evaluate and correct distorted beliefs and misinterpretations (Beck et al., 2004). Cognitive insight is increasingly seen as a malleable target for intervention (Riggs et al., 2012), which points to the importance of integrating this construct in a systematic exploration of clinical insight. To date, no study has evaluated the factor structure of the overarching construct of insight in schizophrenia using combined items from multiple measures of clinical and cognitive insight in a single, large cohort. A better understanding of the broad construct of

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insight and its underlying dimensions will allow us to examine various potential psychological and biological determinants.

The present study was conducted as part of a large cross-sectional research project aimed at investigating factors that may moderate various dimensions of insight in people with enduring schizophrenia. The initial phase of the project involved administering several self-report and clinician-rated measures of insight to a single cohort of participants. Latent variable modelling was applied to explore the number of dimensions that emerge and examine the pattern of variable loadings, with no a priori hypotheses as to the number of such dimensions.

2. Methods

2.1. Participants

Data were collected as part of a larger cross-sectional research project on insight in schizophrenia, for which a minimum sample size of 150 participants was estimated to be necessary to achieve sufficient power (80%) for a structural equation model with 30 parameters (5 participants per free parameter), following the recommendations of MacCallum et al. (1996). An additional 15 participants were added during the study to account for a higher non-completion rate than predicted. While there is no general agreement in the literature in the determination of sample size for factor analysis (Williams et al., 2010), a sample size of 150 participants and 29 items for the factor analysis would provide a sample to variable ratio of 5:1, with further inspection of the data for factorability once available.

Recruitment was conducted at the Douglas Mental Health University Institute and affiliated external resources. A sample of 165 people (113 men, 52 women) aged 18–50 years from the local catchment area who were diagnosed with a non-affective psychotic disorder as confirmed by the Structured Clinical Interview for DSM-IV were recruited. All participants were in an enduring phase of illness, defined by a minimum of three years of pharmacological treatment for psychosis. A semi-structured interview was conducted to determine the age of illness onset and duration of illness. Clinical data were confirmed by medical chart review. Participants were English or French-speaking, and were otherwise physically healthy. Data were collected from November 2011 to June 2015.

Exclusion criteria included low IQ score (>2 standard deviations below group mean) as estimated by the 4-test version of the Wechsler Abbreviated Scale of Intelligence (WASI), history of medical or neurological condition that can affect cognition, family history of hereditary neurological disorders, or current substance dependence. Written informed consent was obtained from all participants or from a legally-appointed decision maker. Research protocols were approved by the Douglas Institute's Research Ethics Committee.

2.2. Evaluations

Participants were evaluated during three sessions over 2–3 weeks. Socioeconomic status (SES) was rated using the Hollingshead two-factor index of social position (Miller, 1991). The education scale was modified accordingly for Quebec. Assessments were completed in English or French. IQ was estimated using the 4-test version of the Wechsler Abbreviated Scale of Intelligence (WASI).

The Scale for the Assessment of Positive Symptoms (SAPS) (Andreasen, 1984b) and the Scale for the Assessment of Negative Symptoms (SANS) (Andreasen, 1984a) were used to measure the severity of positive and negative symptoms. Inter-rater reliability on the SAPS and SANS items was assessed using two-way mixed, consistency, average measures ICCs, with scores in the excellent range (ICC = 0.90) and the good range (ICC = 0.64) for the SAPS and SANS composite total scores, respectively (Cicchetti, 1994). The Calgary Depression Scale (CDS) (Addington et al., 1990) and the Hamilton Anxiety Scale (HAS)

(Riskind et al., 1987) were used to quantify symptoms of depression and anxiety.

2.3. Measures of insight

2.3.1. Interviewer rated measures

The abbreviated Scale for the Assessment of Unawareness of Mental Disorder (SUMD) (Amador et al., 1994; Michel et al., 2013), is a clinician-rated tool that examines patients' current and retrospective awareness for general aspects of the disorder as well as awareness and attribution of specific symptoms. This study included scores for current awareness only. The Schedule for the Assessment of Insight – Expanded (SAI-E) (Kemp and David, 1997) is a clinician-rated measure that evaluates three dimensions of insight: recognition that one is suffering from a mental illness; compliance with treatment; and ability to relabel unusual mental events as pathological.

2.3.2. Self-report measures

The Birchwood Insight Scale (BIS) (Birchwood et al., 1994) is an 8-item self-report scale that measures similar insight dimensions as the SAI-E. The Beck Cognitive Insight Scale (BCIS) (Beck et al., 2004) is a 15-item self-report scale that evaluates two key metacognitive processes of cognitive insight: Self-Reflectiveness (SR), or a willingness to acknowledge fallibility and recognition of dysfunctional reasoning; and Self-Certainty (SC), or a tendency to be overconfident. A composite index score is calculated by subtracting SC from SR.

After administration, we removed duplicated and highly correlated items from our dataset, as well as items with very low correlations with other variables in the model (see Supplementary material). Many participants in our sample had missing data on the SUMD items pertaining to awareness and attribution of symptoms, because specific symptoms are not rated if they are not observed or reported by the participant during the symptom evaluation. For this reason, our analysis included only the symptom awareness and attribution items from the SAI-E, which evaluate the four most prominent symptoms observed or reported.

The items that were included in the analysis were as follows: SUMD #1–2b; SAI-E #1, 4, 5, 7,8; BCIS #2–11,13–14; and BIS #1, 2, 4, 6–8, for a total of 26 items. Where an item score was missing in error, the mean score of all participants on that item was imputed (9 cases). Items from the SUMD and the BCIS self-certainty subscale were reverse-scored so that higher scores reflected better insight for all items included in the analysis.

2.4. Statistical analysis

An exploratory factor analysis (EFA) using principal components extraction was performed on itemized responses from the four measures of insight. Models with varying numbers of components were compared for fit and factor loadings were rotated to facilitate interpretation. A parallel analysis using Watkins' Monte Carlo PCA program (2008) was conducted in order to compare eigenvalues obtained in our data set with those generated from random data and determine the number of components to retain. Measures of reliability and summary scores for each component were calculated, and correlations between the identified dimensions of insight were examined. A sensitivity analysis was conducted using polychoric correlations (see Supplementary material). All statistical analyses were performed using SPSS Statistics version 22.

3. Results

3.1. Demographics

Of the 165 individuals recruited to the study, 24 met exclusion criteria (see Supplementary material). The final sample included 141

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