Psychiatry Research 220 (2014) 1077–1083

Contents lists available at ScienceDirect

Psychiatry Research

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

Symptom assessment in early psychosis: The use of well-established rating scales in clinical high-risk and recent-onset populations

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ARTICLE INFO

Article history:
Received 24 October 2013
Received in revised form
22 July 2014
Accepted 23 July 2014
Available online 1 August 2014

Keywords:
Early psychosis
Assessment
Symptoms
BPRS
SANS/SAPS
PANSS
SOPS

ABSTRACT

Symptom assessment in early psychosis research typically relies on scales validated in chronic schizophrenia samples. Our goal was to inform investigators who are selecting symptom scales for early psychosis research. We described measure characteristics, baseline scores, and scale interrelationships in clinical-high-risk (CHR) and recent-onset psychotic disorder (RO) samples using the Positive and Negative Syndrome Scale, Brief Psychiatric Rating Scale, Scale for the Assessment of Positive Symptoms, and Scale for the Assessment of Negative Symptoms; for the CHR group only, we included the Scale of Prodromal Symptoms. For investigators selecting symptom measures in intervention or longitudinal studies, we also examined the relationship of symptom scales with psychosocial functioning. In both samples, symptom subscales in the same domain, across measures, were moderately to highly intercorrelated. Within all measures, positive symptoms were not correlated with negative symptoms, but disorganized symptoms overlapped with both positive and negative symptoms. Functioning was significantly related to negative and disorganized, but not positive, symptoms in both samples on most measures. Findings suggest strong overlap in symptom severity ratings among the most common scales. In recent-onset samples, each has strengths and weaknesses. In CHR samples, they appear to add little information above and beyond the SOPS.

1. Introduction

Over the past decade there has been a surge of early psychosis research—which includes clinical high-risk (CHR) and recent-onset (RO) samples—to better understand predictors of psychosis onset and mechanisms of psychopathology, and to improve prevention and early intervention efforts. As the majority of this work spawned from research teams studying schizophrenia in primarily adult, chronic samples, assessment instruments were chosen from the broader literature. Research in RO or even some CHR studies use measures validated in these samples, under the assumption that the scales perform similarly with younger participants who are earlier in the course of illness (e.g., John et al., 2003; Yung et al., 2007). While there is a large body of research on the psychometric properties and utility of the most widely used symptom rating scales in schizophrenia generally, researchers in early psychosis are left little guidance in selecting measures that might best fit their needs.

No study to date has examined the symptom ratings of early psychosis samples across the most commonly administered measures. To assist researchers in their measure selection for clinical assessment in early psychosis studies, we describe the development of several prominent scales in detail, highlighting potential strengths and weaknesses for younger, early illness populations, and report on clinician ratings of two young groups (CHR and RO) on all four measures. We present data on the Positive and Negative Syndrome Scale (PANSS), Brief Psychiatric Rating Scale (BPRS), Scale for the Assessment of Negative Symptoms (SANS), and Scale for the Assessment of Positive Symptoms (SAPS) in both samples; in addition, we present data from the Scale of Prodromal Symptoms (SOPS), a widely used measure of attenuated psychotic symptoms, in the CHR sample only. We chose to focus on the three primary factors capturing symptoms of psychosis: positive, negative, and disorganized symptoms. Thus, while other symptom dimensions are undoubtedly important in understanding the phenomenology of individuals with early psychosis, we decided to limit our scope to those most relevant to research groups studying these populations.

We predicted that scales designed to measure the same symptom domains (e.g., positive symptoms) would be highly

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http://dx.doi.org/10.1016/j.psychres.2014.07.047
0165-1781/

intercorrelated across measures, and that these individual domains would not be correlated with other distinct domains, either within or across measures. In addition, we examined the relationships between the symptom rating scales and developmentally appropriate measures of social and role functioning to assess the utility of these scales in early psychosis research. That is, we sought to provide information on how these measures might or might not overlap with clinically meaningful indicators of real-world functioning. We predicted that negative and disorganized, but not positive, symptoms would be associated with deficits in social and role functioning in both samples, consistent with the broader literature (Cornblatt et al., 2007; Niendam et al., 2007; Corcoran et al., 2011; Fulford et al., 2013). With these data we hope to provide guidance for early psychosis researchers in selecting among the most widely used symptom-rating scales to best suit the needs of their particular studies in this population.

2. Methods

2.1. Participants and procedures

Study participants ($N=180$) were recruited for one of two ongoing longitudinal studies at the University of California, San Francisco (UCSF) and the San Francisco Veterans Affairs Medical Center (SFVAMC). In the current report we include post-hoc exploratory analyses based on data from these existing studies. Participants were referred for the studies by outpatient clinics, community clinicians, the school district, family members, or self-referred. Eligible participants belonged to one of two diagnostic groups: 1) those at clinical high-risk (CHR) for developing psychosis (see below for a review of criteria; $n=82$) and 2) those with a recent onset (RO) of schizophrenia, schizophreniform, or schizoaffective disorder (disorder onset within the past 5 years; $n=98$). The latter sample included individuals with an average illness duration of less than 2 years (19.6 months; see Fisher et al., 2014). Exclusionary criteria for the ongoing studies includes the following: the presence of a neurological disorder, IQ < 70, significant drug use, and psychiatric hospitalization in the 3 months prior to study entry, for RO participants (to examine processes related to early psychosis not fully explained by current symptoms or distress). See Table 1 for an overview of demographic variables.

Participants in both studies were selected as part of ongoing longitudinal examinations of early psychosis in the Prodrome Assessment, Research and Treatment (PART) program: our early psychosis clinic that recruits both high-risk and recent-onset samples. Symptom rating scales were administered at baseline and follow-up assessments, although only baseline data are presented in the current study. All symptom rating scales were administered during the same interview session by the same interviewer and were discussed in regular reliability meetings. Interviewers included bachelor's, master's, or doctorate level researchers trained and supervised by an expert assessor.

Interrater agreement was computed for symptom rating scales (BPRS, PANSS, SAPS, and SANS) following the recommendations of Shrout and Fleiss (1979) for a two-way random effects model, Case 2 intraclass correlation (ICC). In the Case 2 class of ICC for reliability, the same set of raters (judges) rate each participant and are considered to be selected from a random sample of raters. Rater is considered a random effect, meaning that the raters in the study are considered a random sample from a population of potential raters. The intraclass correlation coefficients (ICC) of agreement for symptom rating scales, based on a subset of raters and participants, ranged from 0.91 to 0.97.

Table 1
Sample characteristics.

	CHR ($N=82$)	RO ($N=98$)
Age (M years [S.D.])	18.51 (4.38)	21.29 (3.86)
Parental Hollingshead SES* (M [S.D.])	38.39 (16.46)	35.57 (16.49)
Male (%)	56.10	74.50
Non-Hispanic Caucasian (%)	42.7	42.9
Hispanic/Latino (%)	12.2	6.1
African American (%)	4.9	9.2
Pacific Islander (%)	1.2	1.0
Asian American (%)	19.5	26.5
Multiracial (%)	19.5	14.3

Note: CHR = clinical-high-risk; RO = recent-onset.

2.2. Measurements

2.2.1. Clinical diagnosis and psychosocial functioning measures

CHR participants met at-risk criteria as assessed by the Structured Interview for Prodromal Syndromes (SIPS; Miller et al., 2003). The SIPS classifies three types of prodromal syndromes, listed in order of typical sample prevalence: (1) Attenuated Positive Symptom syndrome (APS): attenuated positive psychotic symptoms present at least once per week, started or worsened in that past year; (2) Brief Intermittent Psychotic Symptoms syndrome (BIPS): brief and intermittent fully psychotic symptoms that had started recently; (3) Genetic Risk and Deterioration syndrome (GRD): a decline of at least 30% on the GAF scale in the previous 12 months and either a family history of a psychotic disorder in any first-degree relative or criteria for schizotypal personality disorder are met. For participants aged 16 and above, the presence of DSM-IV (American Psychiatric Association, 2000) Axis I disorders was assessed by the Structured Clinical Interview for DSM-IV-TR (SCID; First et al., 2002); for participants under the age of 16, both the participant and one of the participant's caretakers were administered the Kiddie-Sads Schedule for Affective Disorders and Schizophrenia (K-SADS; Kaufman et al., 1996). Social and occupational functioning were measured using the Global Functioning: Social (GFS; Auther et al., 2006) and Global Functioning: Role (GFR; Niendam et al., 2006) scales, which are clinician administered measures developed specifically to capture the range of functioning in CHR or younger psychosis populations. Interrater reliability for the GFR and GFS is high, and both scales demonstrate construct validity (Cornblatt et al., 2007)

2.2.2. Psychosis symptom rating scales

Here we briefly describe the symptom measures included in this study. For details on scoring, measure development, and strengths and weaknesses, see Supplementary Material.

2.2.2.1. Scale for the Assessment of Negative Symptoms (SANS). The SANS (Andreasen, 1982) measures negative symptoms and consists of 22 items divided into five subscales (Affective Flattening or Blunting, Alogia, Avolition-Apathy, Anhedonia-Asociality, and Attention). A global score for each subscale intended to summarize all of the symptoms within a subscale category is also included. A semi-structured interview is used to make some of the item ratings, with additional ratings based on direct behavioral observation.

2.2.2.2. Scale for the Assessment of Positive Symptoms (SAPS). The SAPS (Andreasen, 1984) consists of 34 items divided into four positive symptom subscales: hallucinations, delusions, bizarre behavior, and positive formal thought disorder. As with the SANS, each subscale also includes a global rating scale.

2.2.2.3. Brief Psychiatric Rating Scale (BPRS). The BPRS (Overall and Gorham, 1962) covers 24 items across all psychosis symptom domains and a total score is calculated by summing all items. The scale is sensitive to change (Ventura et al., 1993; Roncone et al., 1999; Kopelowicz et al., 2008).

2.2.2.4. Positive and Negative Syndrome Scale (PANSS). The PANSS (Kay et al., 1987) is a 30-item scale that combined the 18-item BPRS and 12 items from the Psychopathology Rating Schedule (Singh and Kay, 1975). The PANSS demonstrates strong psychometric properties, including good internal consistency, test–retest reliability, and validity (Kay et al., 1987). Ratings are summed scores on a 7-item positive scale, 7-item negative scale, and 16-item general psychopathology scale.

2.2.2.5. Scale of Prodromal Symptoms (SOPS). The Structured Interview for Prodromal Syndromes (SIPS; Miller et al., 2003) includes the Scale of Prodromal Symptoms (SOPS), a 19-item scale which allows researchers to rate symptoms on four subscales: 1) positive symptoms (e.g., unusual thought content/delusional ideas); 2) negative symptoms (e.g., social anhedonia); 3) disorganized symptoms (e.g., bizarre thinking); and 4) general symptoms (e.g., dysphoric mood). The scale was developed to assess for the presence of attenuated symptoms of psychosis, one of three prodromal syndromes (see above). While the Attenuated Positive Symptom (APS) syndrome is defined by positive symptoms alone, the SOPS provides information on other symptoms relevant to psychosis high-risk samples.

2.2.3. The 'Big Three' symptom factors in psychosis

As our goal in the current study was to provide guidance for early psychosis researchers on selecting scales for the assessment of the primary symptom of psychosis, we decided to focus on the "Big Three" symptom factors. Drawing from previous research (Brekke et al., 1994; Andreasen et al., 1995; Barch et al., 2003; van der Gaag et al., 2006; Klaassen et al., 2011; Jerrell and Hrisko, 2013; Fulford et al., 2013) following the work of Liddle (1987), we separated the SANS, SAPS, PANSS, BPRS and SOPS psychosis symptoms into the three major factors reflecting positive symptoms/reality distortion, negative symptoms/poverty, and disorganized symptoms (see Table 2). Details regarding factor analytic studies of these measures are described in detail in Supplementary Material.