



Emotional and behavioral symptomatology reported by help-seeking youth at clinical high-risk for psychosis



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ABSTRACT

Subthreshold psychosis-like experiences are typically the focus of psychosis-risk screening as they are associated with a greater propensity for future illness. Potentially prodromal individuals identified as being at clinical high-risk (CHR), however, report a variety of distressing and impairing mental health symptoms in addition to subthreshold psychosis symptoms, indicating that this population is of clinical interest regardless of whether or not they develop psychosis. In the current study, 90 young people (12–21) seeking mental health services completed the Behavior Assessment System for Children, Second Edition (BASC-2), a broad-range checklist of emotional and behavioral concerns and adaptive skills, followed by the Structured Interview for Psychosis-risk Syndromes to assess psychosis risk. Those who met criteria for CHR ($n = 35$) reported elevated scores across several BASC-2 scales including depression, attention problems, locus of control, and sense of inadequacy compared to help-seeking youth without CHR ($n = 55$). Most of these scales were also elevated compared to general population norms. Further, the CHR group had significantly lower scores on two adaptive scales, self-reliance and relations with parents, indicating more impairment in these domains. Results indicate that young people at CHR experience more pervasive and/or more severe symptomatology across several domains of clinical significance compared to a similar group of help-seeking youth not at CHR. Results from this study aid in the understanding of symptom correlates of CHR status beyond attenuated symptoms that can provide clinical information relevant for treatment.

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1. Introduction

Individuals at clinical high-risk (CHR) for psychosis experience subthreshold attenuated psychotic symptoms (e.g., increased suspiciousness without overt paranoia) that are impairing enough to cause distress and decline in daily functioning. CHR is associated with heightened risk for developing full-threshold psychotic disorders (Fusar-Poli et al., 2012, 2013; American Psychiatric Association, APA, 2013), and although much research indicates that attenuated symptom severity may be the best predictor of future psychosis (Addington and Heinssen, 2012), individuals at CHR often report a range of mental health symptoms associated with clinically significant distress and impairment that extends beyond psychosis symptoms per se (e.g., anxiety and depression [Riecher-Rössler et al., 2009; Rietdijk et al., 2011; Velthorst et al., 2009], problems with substance abuse [Cadenhead et al., 2010]). By definition, individuals with CHR experience impairment in functioning regardless of whether they eventually develop full-threshold

psychosis (Rosen et al., 2006; Addington et al., 2007; Fusar-Poli et al., 2013, 2014b), and given that these individuals often seek services to address a variety of mental health and behavioral concerns (Rietdijk et al., 2011; Fusar-Poli et al., 2014a), efforts to describe the CHR state by examining a broad range of symptomatology may improve the understanding of the experiences and clinical needs of this population.

To encourage a greater understanding of this clinical high-risk population, the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) has included the “Attenuated Psychosis Syndrome,” a construct very similar to CHR, as a condition for future study that is not currently better captured by another DSM diagnosis (Jacobs et al., 2011; American Psychiatric Association, APA, 2013). Although much research has helped elucidate mental health concerns that predict transition to psychosis among those at CHR, far less research has focused on areas of impairment experienced by those at CHR regardless of conversion. Given that approximately two thirds of individuals who screen positive for risk do not convert to psychosis (Fusar-Poli et al., 2012), the majority of the CHR population is under-represented in the literature despite the fact that many of these individuals are in distress and seeking care. A better understanding of the mental health needs of those with CHR symptoms (regardless of conversion) may help inform

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assessment and treatment. This is particularly relevant as individuals at CHR have a present need for treatment, and that early intervention is likely beneficial for long-term outcomes (Fusar-Poli 2012; Morrison et al., 2012; Preti and Cella, 2010; Stafford et al., 2013; Okuzawa et al., 2014).

Some prior research has demonstrated a high prevalence of mental health diagnoses among individuals at CHR with the most robust findings in the domains of depression, anxiety, and substance abuse (Addington et al., 2007; Fusar-Poli et al., 2012, 2013). Similarly, studies investigating symptomatology have corroborated these findings and suggest several other areas of concerns for those at CHR (e.g., attention, and social and role dysfunction; Addington et al., 2008; Fusar-Poli et al., 2013; Lencz et al., 2004). Limited research with youth at CHR has used checklists that assess a broad range of emotional and behavioral concerns to describe a comprehensive profile of clinically relevant concerns within this population (Simeonova et al., 2011). One recent study by Simeonova et al. (2014) used the Child Behavior Checklist (CBCL; Achenbach and Rescorla, 2001), a parent-report inventory of symptomatology, to describe youth at CHR in comparison to a general population sample. This study reported that CHR youth had more social and behavioral problems than non-psychiatric controls as demonstrated by elevated scores across all domains of the CBCL (e.g., thought problems, attention problems, social problems). Although these findings indicate that individuals at CHR are experiencing a range of elevated symptoms across several clinical and functional domains as reported by their caregivers, this line of work could be complemented by including self-reported symptomatology that could provide insight into the individuals' perceptions of their own clinical needs.

Prior research has largely focused on comparing individuals at CHR to "healthy controls" who do not have clinically significant psychopathology, tentatively attributing differences to emerging psychosis and/or psychosis-risk status. Although these studies have laid the groundwork for understanding the CHR population, whether findings from comparisons with "healthy controls" are specific to psychosis-risk rather than more general characteristics of help-seeking youth remains to be determined. Relatively little research has sought to describe how individuals at CHR differ from other help-seeking youth who have clinically relevant mental health concerns other than CHR symptoms. Within the recent study by Simeonova et al. (2014), youth at CHR were also compared to youth with personality disorders not at CHR. This comparison did not demonstrate differences in CBCL scores at the baseline assessment, but showed elevated scores among the CHR individuals in the withdrawal/depression and thought problems domains at one year follow-up, a time point that may be more proximal to transition to psychosis for some individuals (Simeonova et al., 2014). This study lends support to the notion that CHR individuals may have challenges distinct from psychosis-specific symptoms that may differentiate youth at CHR from youth with other mental health challenges. To date, however, no studies have used a self-report checklist of behavioral and emotional concerns to compare CHR individuals' perceptions of their own symptomatology to self-reports of other help-seeking youth not at CHR.

The current study investigates self-reported symptomatology of help-seeking youth at CHR and help-seeking youth not at CHR, offering the advantage of a clinically and developmentally valid comparison group. We compare self-reported symptom profiles of these groups using the Behavior Assessment System for Children, Second Edition (BASC-2), a validated checklist of a broad range of emotional and behavioral concerns. To our knowledge, no prior research has used a comprehensive measure of a variety of mental health concerns to compare self-reported symptomatology between individuals at CHR and a comparable group of help-seeking young people not at CHR. Insight into the symptom profiles of CHR youth may help inform treatment of this unique population by describing areas of concern or dysfunction commonly reported by these individuals. Based on related findings, we

hypothesize that the CHR group will have significant elevations in symptomatology compared to the non-CHR group across several BASC-2 clinical domains including depression, anxiety, attention problems, and social stress.

2. Method

2.1. Procedure

This study was conducted through the Youth FIRST research program at the University of Maryland, Baltimore County, in collaboration with the University of Maryland School of Medicine, Division of Child and Adolescent Psychiatry. All procedures were approved by both Institutional Review Boards. Participants were recruited through mental health providers from university and community mental health clinics, local schools, and a pediatric inpatient unit. Although individuals receiving mental health services for a variety of concerns were eligible for this study, some clinician referrals were made due to the specialized nature of the study and suspicions related to symptoms of emerging psychosis or psychosis-risk. Despite this partially-specialized referral network, participants were not pre-screened based on their symptoms and a substantial proportion of referrals were for consultation purposes distinct from psychosis-related concerns, or due to participant interest independent from the clinical benefits provided. Participants were evaluated by a master's level or higher clinician and all cases were presented to the research team to ensure clinical consensus.

At the study visit, written consent was obtained from adult participants or from a legal guardian of participants under the age of 18. Written assent was obtained from minor age participants. For participants with guardians, the Kiddie Schedule for Affective Disorders and Schizophrenia, Present and Lifetime Version (K-SADS-PL; Kaufman et al., 1997) was administered first to guardians (reporting on the youth's symptomatology) and then separately to the youth. All youth completed the Behavior Assessment System for Children, Second Edition (BASC-2; Reynolds and Kamphaus, 2004) self-report questionnaire followed by two clinician-administered interviews, the K-SADS and the Structured Interview for Psychosis-risk Syndromes (SIPS; Miller et al., 2003).

2.2. Participants

All participants were recruited through similar procedures and no effort was made to assess for CHR status prior to the study visit. The study included youth who were (1) 12–21 years old and (2) currently receiving mental health services (by a primary care provider or a mental health specialist). The age range was chosen based on the specifications of the BASC-2 self-report questionnaire that is normed and validated for use with individuals 12–21 years old. Individuals under the age of 18 who were under the sole guardianship of the Department of Social Services or who were not under stable guardianship for at least 6 months were excluded.

The study recruited 110 participants. Given the focus of this study on those at risk for psychosis, ten individuals were excluded from the final sample after meeting SIPS criteria for full-threshold psychotic syndrome. Ten additional participants were excluded due to missing data on the BASC-2. Of the 90 eligible participants with complete data, 35 were categorized as CHR-positive based on SIPS criteria and 55 were CHR-negative. The individuals in the CHR-positive group met criteria for at least one of the three SIPS risk syndromes or SPD (consistent with other CHR work within our age range; e.g., Addington et al., 2012; Walker et al., 2013).¹

¹ Two individuals in the CHR positive group met for only SPD.

2.3. Materials

2.3.1. Behavior Assessment System for Children, Second Edition

The BASC-2 is a system of self, informant, and observation-based reports of children's behavioral and emotional functioning. The adolescent version of the Self-Report of Personality (SRP-A) is designed for individuals 12–21 years old and includes 176 items with some questions answered true/false and others rated on a four-point Likert scale (never, sometimes, often, almost always). Individuals are asked to answer according to how they think, act, or feel in general, responses are scored to create twelve clinical scales and four adaptive scales.

The BASC-2 clinical scales assess symptoms included in the DSM (e.g., criteria for depression, anxiety, ADHD) and have been found to have high content validity and convergent validity with other clinical assessments, making these scores highly interpretable with respect to current diagnostic classification and potential targets for treatment (Reynolds and Kamphaus, 2004).

The BASC-2 was normed in the United States using a large representative sample of youth (including over 13,000 cases) from across the nation (Reynolds and Kamphaus, 2004). Aged-normed T-scores are continuously distributed within the population, with a mean of 50 and a standard deviation of 10. Scores one standard deviation or more above the mean (i.e. T-score of 60 or greater) on scale scores may indicate clinically meaningful concerns (Reynolds and Kamphaus, 2004).

2.3.2. Kiddie Schedule for Affective Disorders and Schizophrenia, Present and Lifetime Version

The K-SADS-PL (Kaufman et al., 1997) is a clinician-administered semi-structured diagnostic interview used to assess the presence of symptoms and evaluate diagnostic criteria for current and past episodes of common disorders found in the DSM. For assessments with guardians (including those under the age of 18), the parent and the youth completed the K-SADS interview separately. Clinicians were trained in K-SADS administration by study Principal Investigators (PIs). Reliability training included observing and co-rating multiple K-SADS interviews conducted by several independent experienced staff (including at least one PI) followed by being observed by PIs or other trained staff while conducting study interviews with participants. Clinicians were considered reliable and ready for independent interviewing after reaching perfect agreement on at least three interviews during the co-rating process with experienced staff, and obtaining approval from the PIs. Additionally, team case review and consultation were conducted after each K-SADS interview to ensure agreement across clinicians and PIs.

2.3.3. Structured Interview for Psychosis-risk Syndromes

The SIPS (Miller et al., 2003) is a clinician-administered semi-structured interview used to assess the presence and severity of attenuated positive symptoms (i.e. unusual/delusional thoughts, suspiciousness/persecutory ideas, grandiosity, perceptual abnormalities, and disorganized communication), the standard SIPS criteria for determining CHR status. Positive symptoms are rated on a scale from 0 (absent) to 6 (severe and psychotic), with a rating of 3–5 indicating the presence of attenuated symptoms. Individuals are placed into one of three groups based on their endorsement of these symptoms, low-risk (CHR-negative), high-risk (CHR-positive), or full-threshold psychosis. The CHR-positive group includes individuals meeting SIPS criteria for one or more of the specific psychosis-risk syndromes assessed. Additionally, consistent with other studies with similar samples, we include individuals meeting Schizotypal Personality Disorder (SPD) as at risk (e.g., Walker et al., 2013). See Table 1 for SIPS risk syndromes and criteria.

Clinicians were trained in SIPS administration by attending and obtaining certification through an official SIPS training seminar (conducted by SIPS creators), or by an extensive training process within the lab. Reliability training includes practice rating written vignettes

Table 1
SIPS diagnoses indicating CHR-positive status.

SIPS diagnosis	Brief description of criteria	Sample size
Schizotypal Personality Disorder (SPD)	Presence of 5 of the following symptoms beginning in adolescence or young adulthood (and persisting for at least 1 year for those under 18): ideas of reference, odd beliefs/magical thinking, unusual perceptual experiences, odd thinking and speech, suspiciousness/paranoia, inappropriate/restricted affect, odd behavior/appearance, lack of friends, or excessive social anxiety	$n = 7$
Attenuated Positive Symptom Psychosis-Risk Syndrome (APS)	Presence of at least one attenuated positive symptom beginning or worsening in the past year and occurring at least once per week over the past month	$n = 28$
Genetic Risk and Deterioration Prodromal Syndrome (GRD)	Presence of SPD or a first degree relative with a psychotic disorder and a 30% decline in functioning within the past month	$n = 4$
Brief Intermittent Psychotic Symptom Psychosis-Risk Syndrome (BIPS)	Presence of at least one psychotic-intensity positive symptom that developed in the past 3 months and occurs at least once per month but is not yet dangerous or severely disorganizing	$n = 2$

Note: Due to the possibility of having concurrent risk syndrome diagnoses, the cumulative number of SIPS categorizations exceeds the CHR-positive sample size ($n = 35$).

and audio recorded interviews followed by co-rating two in vivo interviews and being observed by trained staff while conducting study interviews (until two cases match the ratings of the observing interviewer). Case review and consultation are conducted after each SIPS interview, and ongoing reliability training has produced high symptom reliability ($ICC = .82$) and perfect diagnostic agreement ($kappa = 1$) among raters.

2.4. Analyses

The study sample was divided into CHR-positive versus CHR-negative groups based on SIPS results. All dependent variables (BASC-2 T-scores) were found to be normally distributed, demonstrating skewness and kurtosis values acceptable for parametric analysis (Curran et al., 1996). We first conducted a series of chi-square analyses to test for differences across groups in the prevalence of several major diagnostic categories. To assess for BASC-2 identified differences between the CHR-positive and CHR-negative groups, we conducted a multivariate analyses of variance (MANOVA) to test for group differences on all BASC-2 clinical and adaptive scales to compare symptomatology across groups.

3. Results

As expected, the CHR-positive group had significantly higher mean scores compared to the CHR-negative group on most of the SIPS positive symptoms (i.e. unusual/delusional thoughts, paranoia/suspiciousness, perceptual abnormalities, and disorganized communication). The CHR-positive group was younger than the CHR-negative group, but given that the BASC-2 T-scores were age normed, this was not considered a potential confound for analyses. See Table 2 for sample and group characteristics.

Chi-square analyses indicated a significant difference in the occurrence of K-SADS identified mood disorders across groups, with the CHR-positive group having more mood diagnoses, and a trend-level difference ($p = .08$) in anxiety disorders in the same direction. Although all participants were receiving services for mental health concerns, the

Table 2
Demographic and clinical characteristics across groups.

	Full sample (n = 90)	CHR-positive (n = 35)	CHR-negative (n = 55)	Test statistic (CHR-pos. vs. CHR-neg.)	Significance
Mean age (SD)	15.82 (2.80)	14.97 (2.16)	16.36 (3.03)	F = 5.59	p < .05
Female gender: % (n)	64.4% (58)	71.4% (25)	60.0% (33)	F = 1.21	p = .28
Median household income	\$20,000–39,999	\$20,000–39,999	\$20,000–39,999		
Race: % (n)					
Black/African American	48.9% (44)	51.4% (18)	47.3% (26)	$\chi^2 = 0.15$	p = .70
White/Caucasian	27.8% (25)	25.7% (9)	29.1% (16)	$\chi^2 = 0.12$	p = .73
Multi-racial	15.6% (14)	14.3% (5)	16.4% (9)	$\chi^2 = 0.07$	p = .79
Other/unreported	7.8% (7)	8.6% (3)	7.3% (4)	$\chi^2 = 0.05$	p = .82
Mean SIPS positive symptom total (SD)	7.76 (5.30)	12.74 (4.08)	4.63 (3.16)	F = 109.44	p < .001
Mean SIPS GAF (SD)	54.51 (12.15)	50.35 (11.76)	57.13 (11.76)	F = 6.93	p = .01
Diagnosis: % (n)					
Mood disorder	54.4% (49)	68.6% (24)	45.5% (25)	$\chi^2 = 4.61$	p < .05
Anxiety disorder	40.0% (36)	51.4% (18)	32.7% (18)	$\chi^2 = 3.12$	p = .08
AD/HD	53.3% (48)	57.1% (20)	50.9% (28)	$\chi^2 = 0.33$	p = .57
Behavioral disorder	26.7% (24)	34.3% (12)	21.8% (12)	$\chi^2 = 1.70$	p = .19
PTSD	26.7% (24)	31.4% (11)	23.6% (13)	$\chi^2 = 0.66$	p = .42
Other diagnosis	16.7% (15)	8.6% (3)	21.8% (12)	$\chi^2 = 2.70$	p = .10
No diagnosis	6.7% (6)	0% (0)	10.9% (6)	$\chi^2 = 4.09$	p < .05
Medication: % (n)					
Antidepressant	38.9% (35)	48.6% (17)	32.7% (18)	$\chi^2 = 2.26$	p = .13
Antianxiety	5.6% (5)	5.7% (2)	5.5% (3)	$\chi^2 < 0.01$	p = .96
AD/HD medication	41.1% (37)	48.6% (17)	36.4% (20)	$\chi^2 = 1.32$	p = .25
Antipsychotic	20.0% (18)	28.6% (10)	14.5% (8)	$\chi^2 = 2.63$	p = .10
Mood stabilizer	5.6% (5)	2.9% (1)	7.3% (4)	$\chi^2 = 0.79$	p = .37

Table 3
BASC-2 scale scores across groups.

	CHR-positive (n = 35)	CHR-negative (n = 55)	Test statistic	Significance	Cohen's <i>d</i> ^a
BASC-2 clinical scales: Mean T-score (SD)					
Range					
Atypicality	65.57 (17.50) 42–98	48.76 (8.84) 40–79	F = 36.35	p < .001	1.22
Anxiety	62.54 (14.71) 32–83	55.89 (12.21) 32–81	F = 5.41	p < .05	0.49
Depression	60.11 (12.86) 41–85	52.24 (10.48) 36–88	F = 10.11	p < .01	0.67
Attention problems	64.94 (11.38) 41–82	56.36 (11.73) 36–80	F = 11.71	p = .001	0.74
Hyperactivity	60.49 (15.80) 33–97	54.04 (12.67) 33–90	F = 4.57	p < .05	0.45
Locus of control	59.57 (12.52) 37–80	52.53 (9.60) 37–86	F = 9.07	p < .01	0.63
Social stress	62.06 (15.53) 36–88	54.58 (10.70) 37–88	F = 7.32	p < .01	0.56
Sense of inadequacy	62.89 (14.98) 36–89	53.53 (12.95) 31–89	F = 9.88	p < .01	0.67
Somatization	61.66 (14.58) 40–87	53.76 (12.79) 38–81	F = 7.30	p < .01	0.58
Sensation seeking	50.63 (10.80) 28–70	48.49 (10.35) 24–70	F = 0.88	p = .35	0.20
Attitude to school	55.63 (13.65) 32–80	53.00 (9.94) 35–81	F = 1.11	p = .29	0.22
Attitude to teachers	53.89 (11.63) 36–82	51.71 (9.96) 34–77	F = 0.90	p = .35	0.20
BASC-2 adaptive scales: Mean T-score (SD)					
Relations with parents	41.00 (10.62) 18–60	48.27 (10.35) 18–65	F = 10.35	p < .01	0.69
Interpersonal skills	42.43 (14.31) 10–62	47.04 (11.64) 10–62	F = 2.80	p = .10	0.35
Self-reliance	43.00 (14.15) 21–71	48.18 (8.91) 30–70	F = 4.56	p < .05	0.44
Self-esteem	43.45 (15.06) 13–62	45.96 (14.97) 10–63	F = 0.60	p = .44	0.17

^a Standards for interpreting Cohen's *d* effect sizes are as follows: 0.2 = "small", 0.5 = "medium", and >0.8 = "large" (Cohen, 2013).

CHR-negative group had significantly more individuals whose K-SADS evaluations did not yield psychiatric diagnoses.

The CHR-positive group displayed clinically meaningful T-score means (at or above 60) across several BASC-2 clinical domains relative to published norms (Table 3). CHR-positive help-seeking youth also displayed statistically significant elevations in clinical scale scores (indicating more severe symptomatology) compared to the CHR-negative help-seeking group on several BASC-2 clinical scales (Table 3).

Both groups had mean scores within normal range on all adaptive scales (Table 3). The CHR-positive group had significantly lower T-scores (indicating more impairment) than the CHR-negative group within two adaptive domains, relations with parents and self-reliance, and there was a trend-level difference in the same direction on the interpersonal skills scale.

4. Discussion

This is the first study to examine CHR status using the BASC-2, and to compare BASC-2 symptomatology among those with CHR to other help-seeking youth who do not meet criteria for CHR. Findings suggest that help-seeking young people with CHR exhibit clinically relevant symptomatology across several domains of psychopathology as indicated by self-reported BASC-2 scores above published cut scores. Findings also suggest that the clinical profiles of help-seeking youth with CHR, as indicated by mean BASC-2 clinical scale scores, may be distinct from other populations of help-seeking individuals without CHR. Among the full sample, those with CHR had comparatively higher scores across most clinical domains. These findings suggest that while both groups, 1) included individuals with heterogeneous mental health concerns that inspired help-seeking behavior prior to the study, 2) were recruited through comparable referral sources, and 3) did not differ significantly in the types of medications they are prescribed, individuals with CHR are more likely to report elevated concerns in a variety of other mental health domains in addition to psychosis related symptoms (i.e. anxiety, depression, locus of control, inadequacy, somatization, attention problems, hyperactivity, and social stress). Individuals at CHR appear to be experiencing more and/or more severe symptoms than comparable help-seeking youth without CHR.

Higher scores on the atypicality scale among CHR-positive individuals are not surprising given that this scale assesses symptoms similar to defining characteristics of CHR (Thompson et al., 2013, 2014). Other areas of elevation within the CHR-positive group compared to the CHR-negative group (i.e. depression and attention problems) are congruent with findings from previous studies suggesting that clinical comorbidities are quite common among youth at CHR in the domains of mood and attention (Lencz et al., 2004; Yung et al., 2004; Rosen et al., 2006; Addington et al., 2007; Riecher-Rössler et al., 2009; Velthorst et al., 2009). Further, elevated scores in the social stress domain are consistent with a growing literature suggesting that social functioning deficits may be a specific risk factor for psychosis (Addington and Heinssen, 2012).

Irrespective of the inferential findings comparing young people with CHR to those without CHR, it is worth noting that help-seeking youth with CHR experience elevated mean levels of symptomatology (on average one standard deviation higher than the normative group) in comparison to the age-normed general population sample across a broad range of clinical domains. Elevated domains include atypicality, anxiety, depression, attention problems, sense of inadequacy, self-reliance, somatization, hyperactivity, and social stress, and all constitute areas of potential concern and intervention for youth at CHR. The fact that we observed differences relative to a clinical comparison group and general population norms through age normed self-report data extends this literature, adding further confidence that CHR status is associated with heterogeneous symptomatology that may be indicative of distress and clinical need.

Results regarding differences in mean adaptive scores across groups indicate that those at CHR have significantly lower scores on relations with parents, suggesting more impairment in this area of primary support compared to help-seeking individuals without CHR. This finding is consistent with prior evidence suggesting that within families with a child who has mental health concerns, family functioning and parent–child relationships may be more susceptible to stress and discord (Johnston and Mash, 2001; Blanchard et al., 2006; Schiffman et al., 2014). Within an at-risk group, McFarlane and Cook (2007) reported that critical comments from caregivers were largely reactive to deterioration associated with developing psychosis. Further, our findings align with prior evidence that caregivers of youth with schizophrenia spectrum disorders in particular experience high levels of stress and psychological burden (Knock et al., 2011) that may negatively impact familial relationships that play an important role in treatment engagement and outcomes. Creating or maintaining positive parent–child relations can be an important prognostic factor for young people at risk for psychosis (O'Brien et al., 2008, 2014), highlighting another potential target for CHR intervention.

Given the wide range of clinically relevant difficulties endorsed by individuals at CHR, in addition to research indicating that early intervention may be effective for reducing psychosis-related symptomatology and preventing or delaying transition to psychosis (van der Gaag et al., 2013; Okuzawa et al., 2014), efforts to develop and refine flexible and wide-reaching treatment protocols for individuals at CHR seem warranted. Interventions that take a flexible approach to treatment could provide a model of care that can be tailored to the unique and dynamic needs of individuals at CHR by offering clinicians an array of evidence-based modules to use as needed to address psychosis-specific symptoms as well as co-occurring difficulties (Thompson et al., 2015). In line with the current findings, treatment modules focused on psychosis-risk could be complemented by strategies designed to address factors such as attention, locus of control, depression, and relationships with parents.

4.1. Limitations and future directions

Although this study was intended to shed light on the clinical profile of those at CHR, the cross-sectional design limits our ability to comment on the course of specific symptoms as individuals progress toward or away from psychosis. We contend, however, that the present findings provide a meaningful snapshot of clinical distress experienced by this group in and of themselves, and relative to that experienced by a non-CHR help-seeking control group.

Although the naturalistic control group might be considered a strength of the current design, research comparing youth at CHR to distinct populations of help-seeking youth (e.g., individuals with depression, anxiety, or ADHD) could serve to elucidate differences between specific groups to expand our understanding of differential symptomatology. Despite the fact that the CHR-positive group was more likely to have a mood or anxiety disorder, given that the study sample was composed of individuals seeking mental health care for a variety of reasons, it can be reasonably assumed that differences between the groups were a function of CHR status. As a function of the specialized nature of our clinic, the current study may have included several participants suspected of experiencing psychosis-risk symptoms who upon evaluation did not meet CHR criteria, and were therefore assigned to the CHR-negative group. As a result, it is possible that more individuals within our help-seeking comparison group may be at a slightly elevated risk (though still not meeting risk criteria) compared to groups of help-seekers that would be expected in a non-specialized clinic. Given the possibility of having a control group more similar to the index group than what would be expected in the general population of help seekers, our observed differences between CHR and non-CHR are likely conservative,

adding further confidence that clinical differences exist between those at CHR and those not at CHR.

Another limitation of the current study is that we only considered self-reported emotional and behavioral concerns, and thus we can only discuss CHR symptomatology from one perspective. Self-report may be limited due to poor insight, biases that influence responses, and other considerations (e.g., fatigue, mood, stress) that may impact the accuracy of our results. Given evidence from prior research that parent-reported symptomatology may be useful for distinguishing individuals at CHR from other clinical populations (Simeonova et al., 2014), future research may benefit from considering information obtained from parents, clinicians, and teachers (Tsuji et al., 2013). Methodology including multiple informants could provide additional insight into youths' behaviors and symptoms that may impact functioning and inform clinical conceptualization and treatment.

Although on average CHR participants demonstrated statistically significant deviations from the CHR-negative group, and there is considerable range in scores among individual participants across different scales, CHR mean BASC-2 scores tended to fall in the "at-risk" range relative to BASC-2 national norms (approximately one standard deviation above the norm-group average). Further investigation into the patterns of symptomatology for subgroups of individuals at CHR is necessary to better inform the conceptualization of CHR and to tailor treatment strategies.

These findings give rise to several questions regarding clinical differences between help-seeking CHR and non-CHR individuals beyond elevations in symptomatology. Areas for future research might address differences in hospitalizations, pathways to care, care received, and other aspects of the illness onset and course that may distinguish help-seekers at CHR. Additionally, future intervention research might use findings from this and other similar studies to guide the development of CHR intervention protocols and build treatment modules that target symptomatology that commonly co-occurs with psychosis-risk symptoms.

4.2. Conclusions

This study provides insight into the types of symptoms experienced by help-seeking youth at CHR. These youth experience a broad range of clinical symptomatology at elevated levels compared to help-seeking youth who do not endorse symptoms linked to psychosis-risk, as well as compared to general population norms. In addition to relatively high levels of clinical symptomatology, youth at CHR also reported significant impairments in relationships with parents that may negatively impact the youth's ability to cope with distress, manage symptoms, and maintain an acceptable level of functioning. The specific elevations in clinical symptoms experienced by individuals at CHR indicates a clinical profile that can assist in better understanding the unique aspects of the group, and also potentially provide useful information regarding conceptualization and treatment. Clinical awareness to issues such as mood, anxiety, attention, and social stress for youth identified at CHR can help clinicians isolate potential targets of treatment, as well as potentially set a stage for "modular" strategies for care (e.g., CBT for mood or anxiety, behavioral interventions for attention, social skills training or stress management for social stress). Given evidence for the efficacy of early intervention among youth at risk for psychosis, better understanding of symptoms common among individuals at CHR can help improve our approach to treatment. Intervention strategies that include methodologies specific to psychosis-related symptom management as well as possible clinical concern beyond psychosis may facilitate better care for the heterogeneous and complex symptom presentation seen among those at risk.

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Contributors

Dr. Schifman oversaw the study design, data analysis, data interpretation, and manuscript preparation. Ms. Thompson contributed to data collection, interpretation, and analysis, and took the lead on manuscript preparation. Ms. Kline contributed to data collection and data interpretation. Dr. Reeves oversaw protocol development and implementation. Dr. Mittal, Dr. Ellman, and all authors mentioned above have contributed to writing and editing the final manuscript.

Conflict of interest

The authors have no actual or potential conflicts of interest to disclose.

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