Published in final edited form as:

Psychiatry Res. 2014 February 28; 215(2): 323–328. doi:10.1016/j.psychres.2013.12.002.

Assessing depression in youth at clinical high risk for psychosis: a comparison of three measures

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Abstract

Depressive symptoms are prevalent among individuals at clinical high-risk (CHR) for psychosis. Prior studies have used the Beck Depression Inventory (BDI), Hamilton Depression Rating Scale (HDRS), and the “dysphoric mood” item of the Scale of Prodromal Symptoms (SOPS) to assess depressive symptoms in CHR samples. We compared the psychometric properties of these instruments in a CHR cohort, to support the selection of appropriate depressive symptoms measures in future studies and in clinical settings. Internal consistency was assessed using Cronbach’s alpha. Construct validity was assessed through correlations with SOPS items that were expected or not expected to be related to depressive symptoms. Criterion validity was assessed by comparing scores between patients with and without a major depressive disorder diagnosis. We hypothesized based on the schizophrenia literature that the BDI would have superior internal consistency and discriminant validity compared to the HDRS, and that all three measures would show convergent validity and criterion validity. The BDI demonstrated superior internal consistency and construct validity in this at-risk sample. The BDI and HDRS differentiated patients with major depressive disorder, but SOPS dysphoria did not. This has implications for the choice of depression measures in future CHR studies and for the interpretation of past findings.

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Keywords

prodrome; at-risk; schizophrenia; depressive symptoms; reliability; validity; psychometric

1. Introduction

Depressive symptoms are common in people with schizophrenia (reviewed in Lako et al., 2012) and those at increased clinical risk for psychosis (Addington and Tran, 2009; Amminger et al., 2006; 2010; Cannon et al., 2008; Corcoran et al., 2011; 2012; DeVylder et al., 2012; 2013; Lee et al., 2011; Marshall et al., 2012; Mason et al., 2004; McGlashan et al., 2006; McGorry et al., 2002; Miller et al., 2003a; Niendam et al., 2009; Perivoliotis et al., 2009; Phillips et al., 2007; Pruessner et al., 2013; Rietdijk et al., in press; Ruhrmann et al., 2010; Schlosser et al., 2012; Thompson et al., 2007; Thompson et al., 2009; Woods et al., 2003; Yung et al., 2003; 2004). In structured interviews used for ascertainment of clinical risk states for schizophrenia (Miller et al., 2003b), depressive symptoms are considered to be general “prodromal” symptoms (along with stress sensitivity, motor abnormalities, and sleep disturbance), distinct from positive, negative, and disorganized symptoms (Hawkins et al., 2004). At the same time, depressive symptoms have been associated with greater negative, disorganized and general (but not positive) prodromal symptoms (Corcoran et al., 2011).

There is evidence of a potential role of depressive symptoms in progression of the psychosis prodrome when retrospectively assessed following psychosis onset (e.g., Häfner et al., 2008; Myles-Worsely et al., 2007), and in improvement of psychotic-like symptoms in tandem with depressive symptoms in help-seeking youth (Yung et al., 2007). Depression is additionally associated with poor global and social function in CHR samples, independent of negative symptoms (Fulford et al., 2013). In meta-analysis, diagnosis of major depressive disorder (as opposed to depressive symptoms) occurs in approximately 41% of CHR patients and is associated with suicidality, disorganized behavior, and negative symptoms, but not with risk of transition to threshold psychotic disorder (Fusar-Poli et al., in press). These findings highlight the importance of the accurate assessment of depressive symptomatology among clinical high risk (CHR) youth, with implications for identification of individuals at greatest risk.

Measures used to assess depressive symptoms in CHR cohorts have primarily included the Hamilton Depression Rating Scale (HDRS; Hamilton, 1960), the Beck Depression Inventory (BDI; Beck et al., 1961), the Scale of Prodromal Symptoms (SOPS; Miller et al., 2003b), and the Calgary Depression Scale for Schizophrenia (CDSS; Addington et al., 1992). Some studies have also used the Montgomery-Asberg Depression Rating Scale (MADRS; Montgomery and Asberg, 1979), and the Positive and Negative Syndrome Scale (PANSS; Kay et al., 1987). The psychometric properties of these measures vary, and the degree to which they may differentially assess depressive symptomatology among CHR patients in particular remains unclear. Prior psychometric studies in people with schizophrenia may be informative in predicting the properties of the same measures in CHR samples, with the caveat that the majority of CHR patients will not transition to threshold psychotic disorder and may instead have other mental health conditions complicated by attenuated psychotic symptoms.

The HDRS (Hamilton, 1960) is a clinician-rated measure that assesses behavioral and somatic aspects of depressive symptoms (Hamilton, 1960). In people with schizophrenia, the HDRS’s internal consistency is adequate ($\alpha=0.77$), although lower among outpatients ($\alpha=0.66$) (Addington et al., 1992), and construct validity is questionable in that it is highly correlated with the negative symptoms subscale of the PANSS (Collins et al., 1996). The

BDI (Beck et al., 1961) is a self-report measure of subjective depression severity (Beck et al., 1961). Direct comparison of the HDRS and BDI indicates that the BDI's internal consistency is especially high in schizophrenia ($\alpha=0.92$), substantially better than that of the 17-item HDRS ($\alpha=0.77$), although both are adequate (Addington et al., 1992). The HDRS and BDI may also vary in underlying factor structure and therefore may be indexing different aspects of depression, with the BDI emphasizing functional impairment and subjective distress whereas the HDRS more broadly includes anxiety and somatic factors (Brown et al., 1995), although factor differences may also reflect method variance (Steer et al., 1987). Method variance may also contribute to the differences in reliability between the measures, as self-report assessment may produce superior internal consistency in the BDI relative to the clinician-administered HDRS (Donaldson & Grant-Vallone, 2002).

The SOPS dysphoric mood item (Miller et al., 2003b) is a single-item clinician-rated measure of depression, anxiety, and irritability derived from semi-structured interview (Structured Interview for Prodromal Syndromes; Miller et al., 2003b) included as part of the "general symptoms" subscale. While not purely a measure of depression, it may be a simple and useful proxy measure of depressive symptoms in this population as it is already assessed as part of the SOPS and would not require additional instruments; the purpose of its inclusion in this study is to test its validity in this capacity. In a factor analysis of the SOPS, the dysphoric mood item carries the strongest loading on a factor that also includes the remaining general symptoms, as well as disorganized and negative symptoms (Hawkins et al., 2004).

Herein, we examined the reliability, convergent and discriminant validity, and criterion validity, of three commonly used depression measures, including the HDRS, BDI, and dysphoric mood item of the SOPS. The CDSS was not utilized with the current cohort and therefore not available for analysis. Accurate measurement of depressive symptoms is of research importance in elucidating the role of depression in progression of the at-risk state, and of potential clinical importance given that depression is a highly prevalent and impairing feature of the CHR syndrome. Results may also be valuable in interpreting disparities in past research findings, which may reflect methodological variance. It is particularly important to understand the construct validity of depressive symptom measures in this population given potential confounding by negative symptoms. This is the first study to our knowledge to provide psychometric data on multiple measures of depressive symptoms among CHR individuals. The BDI was expected to show greater internal consistency than the HDRS, as is observed in schizophrenia (Addington et al., 1992). All three measures were expected to show convergent construct validity, defined as significant associations with depression-related SIPS/SOPS items. The BDI, however, was expected to show better discriminant construct validity given previous associations of the SOPS dysphoric mood item and the HDRS with disorganized and negative symptoms in CHR youths (Corcoran et al., 2011; Hawkins et al., 2004). Finally, all three depression measures were expected to show criterion validity, operationalized as their ability to distinguish between participants with and without a diagnosis of major depressive disorder.

2. Method

2.1. Participants

This study was conducted at the Center of Prevention and Evaluation, the psychosis-risk clinical research program at the New York State Psychiatric Institute at Columbia University Medical Center. Participants were 50 help-seeking youths ascertained as at clinical high-risk for psychosis, generally referred from schools and clinicians, or self-referred from the program website (www.copeclinic.org). Sample size was similar to previous psychometric studies of depressive symptom measures in schizophrenia patients (e.g., $n=37$ with HRSD,

CDSS, and PANSS, Collins et al., 1996). All participants provided written informed consent, or if under the age of 18, written assent with provision of written informed consent by a parent. This study was approved by the Institutional Review Board at the New York State Psychiatric Institute at Columbia University Medical Center.

2.2. Inclusion/Exclusion Criteria

Participants were between the ages of 12 and 30 years and English-speaking. Participants met criteria for one of three prodromal syndromes, as assessed with the Structured Interview for Prodromal Syndromes (SIPS; Miller et al., 2003b): 1) attenuated positive symptoms syndrome (positive symptoms in the prodromal range or 3–5, beginning within the past year and occurring at least once per week for last month); 2) genetic risk and deterioration syndrome (having a first-degree relative with any psychotic disorder or having schizotypal personality disorder, with a 30% drop in function over the past year); or 3) brief intermittent psychotic symptoms syndrome (sporadically experiencing symptoms of threshold severity at least several minutes per day and at least one per month beginning in the past three months). Attenuated positive symptoms could not have occurred solely in the context of substance use or withdrawal, or be better accounted for by another disorder. Although some participants were prescribed anti-psychotic medications in an effort to prevent progression to threshold psychotic disorder, none had met criteria for a psychotic disorder at the time of reported assessments. Participants must have been assessed for depression using the HDRS (Hamilton, 1960), the BDI (Beck et al., 1961), and the SOPS (Miller et al., 2003b). Exclusion criteria included risk of harm to self or others, history of threshold psychosis based on SIPS/SOPS presence of psychosis criterion, history of major medical or neurological disorder, and mental retardation (i.e., IQ < 70).

2.3. Measures

Demographic characteristics were reported by the patients. Ethnicity was classified into four categories (non-Latino white, non-Latino black, Latino, and Asian/Pacific Islander). Clinical symptoms were rated using the Structured Interview for Prodromal Syndromes/Scale of Prodromal Symptoms (SIPS/SOPS; Miller et al., 2003b) by trained clinicians. All final SIPS/SOPS ratings were determined by consensus of clinical interviewers and the program director (C. Corcoran). Inter-rater reliability has been demonstrated to be adequate to excellent for individual SOPS items (Miller et al., 2003b). The SOPS consists of subscales measuring positive, negative, and disorganized symptoms, as well as a general symptom subscale that includes three items specifically related to depressive symptoms: dysphoric mood, sleep disturbance, and impaired tolerance to normal stress (the fourth item is motor abnormalities). Lifetime major depressive disorder (MDD) and other DSM-IV diagnoses were determined using the Structured Clinical Interview for DSM-IV Diagnoses (SCID; Spitzer et al., 1992) or the Diagnostic Interview for Genetic Studies (DIGS; Nurnberger et al., 1994) for patients aged 16 years and older, and using the Kiddie Schedule for Affective Disorders and Schizophrenia - Present and Lifetime Version for patients ages 12–15 years (K-SADS-PL; Kaufman et al., 1997). All interviews were conducted by masters level or above clinical research interviewers, and diagnoses were established by MD or PhD level clinicians in consensus with experts on each of the assessment measures. Diagnostic interviews and measures of depressive symptoms were carried out during the same assessment period but by separate interviewers.

The depression variables examined were the HDRS (Hamilton, 1960) and BDI (Beck et al., 1961), and the SOPS dysphoric mood item (Miller et al., 2003b), a single-item depression measure developed specifically for CHR cohorts. The BDI is a 21-item self-report measure, completed by the respondents with the assistance of a trained clinician. The HDRS is a 17-item clinician-rated scale, with consensus of ratings achieved for each assessment by trained

clinicians. The SOPS dysphoric mood item is rated on a 0–6 severity scale (anchored by 0, “absent” and 6, “painfully unpleasant mixtures of depression, irritability, or anxiety that may trigger highly destructive behaviors like suicide attempts or self-mutilation”) and probed by seven questions through semi-structured interview (SIPS; Miller et al., 2003b). All measures assessed severity of depressive symptoms as continuous variables, rather than categorically determining the presence or absence of depression.

2.4. Data analysis

Total scores on the HDRS (Hamilton, 1960), BDI (Beck et al., 1961) and SOPS dysphoric mood (Miller et al., 2003b) were examined for associations with demographic variables (age, sex, ethnicity, employment, education), current medications (anti-depressants, anti-psychotics), and with each other using Pearson’s r correlations and Student’s independent samples t -tests. Cronbach’s alpha was used to test the internal consistency of the HDRS and the BDI.

In order to examine discriminant and convergent construct validity (Cronbach and Meehl, 1955), Pearson’s r correlations were calculated between total scores on the HDRS, BDI, and SOPS dysphoric mood and each SOPS subscale score (positive symptoms, negative symptoms, disorganized symptoms, general symptoms), and with individual depression-related SOPS items. Convergent construct validity would be supported if each measure were correlated with the remaining two depression measures, and on the Scale of Prodromal Symptoms, the total general symptoms subscale, which includes items specifically related to depressive symptoms, and the two specific depression-related items (i.e. sleep disturbance, and impaired tolerance to normal stress, which weigh together on a factor with dysphoric mood in prior factor analysis of the SIPS/SOPS; Hawkins et al., 2004). Discriminant construct validity would be supported if the measures were *not* associated with the remaining positive, negative, and disorganized subscales. Rather than relying on a single statistical test, we analyzed the matrix to determine a ‘pattern of correlations’ to argue for or against construct validity (Cronbach and Meehl, 1955; DeVellis, 2012). Construct validity analyses were rerun with the exclusion of respondents who were prescribed anti-psychotic medications. Finally, because prior reports show that the HDRS was hypothesized to be associated with negative symptoms in this sample, as in schizophrenia (Collins et al., 1996), an exploratory construct validity analysis was also performed for the depression, insomnia, anxiety, and somatic subscales of the HDRS (Shafer, 2006) in order to better understand which subscale may be driving any such association.

The BDI, HDRS, and SOPS dysphoric mood measures were further examined for criterion validity, operationalized as their ability to distinguish between CHR youth with and without a lifetime diagnosis of MDD, using independent-samples t -tests. All tests were two-tailed with alpha level set at 0.05, with effect sizes presented as Cohen’s d .

All analyses were conducted separately using parametric statistics (as described above) and using non-parametric statistics. Results were not meaningfully different when using non-parametric analyses. Therefore, only parametric data is presented.

3. Results

All 50 participants met criteria for attenuated positive symptoms syndrome. Two also met criteria for genetic risk and deterioration syndrome and one for brief intermittent psychotic syndrome. Participants were primarily male and slightly over one third were Caucasian (Table 1), with levels of prodromal symptoms similar to other North American CHR cohorts (Cadenhead et al., 2010), and with mild to moderately severe depressive symptoms (Table 2). Female participants were more likely to have a lifetime diagnosis of MDD than male

participants (90.9% versus 41.0%, $X^2(1, n=50)=8.55, p=0.03$). Depression scores did not vary by use of medications or by demographic factors for any of the three measures (data not shown) except that HDRS scores were moderately correlated with age ($r=0.33, p<0.05$). The HDRS, BDI, and SOPS dysphoric mood were significantly moderately correlated with each other (Table 2).

Internal consistency was stronger for the BDI, $\alpha=0.89$ than for the HDRS, $\alpha=0.78$ and both were in the acceptable range. Item-total correlations, which measure the association between each individual item and the overall score, ranged from -0.06 to 0.60 for the HDRS and from 0.18 to 0.68 for the BDI.

As for construct validity, the BDI was significantly correlated with general symptoms only, as predicted. By contrast, the HDRS was correlated with general, disorganized, and negative symptoms, and SOPS dysphoric mood was associated with general and disorganized symptoms (Table 2). All three of the depression scales were associated with individual depression-related SOPS items (sleep disturbance and impaired stress tolerance), as expected. Of note, when excluding respondents taking anti-psychotic medications ($n=8$), the HDRS was no longer associated with sleep disturbance or, along with SOPS dysphoria, with total disorganized symptoms (Supplementary Table).

Given the broad associations of the HDRS with SOPS subscales, we reran all construct validity correlations in an exploratory fashion using only the depressive-symptoms subscale of the HDRS (Shafer, 2006). The pattern of correlations was similar when using the depression subscale versus the HDRS total score (negative: $r=0.33, p<0.05$; disorganized: $r=0.39, p<0.05$; general: $r=0.44, p<0.05$). The anxiety ($r=0.34, p<0.05$) and insomnia ($r=0.43, p<0.05$) subscales of the HDRS were associated with SOPS general symptoms, whereas the HDRS somatic subscale was associated with SOPS negative symptoms, $r=0.32, p<0.05$, in addition to general symptoms, $r=0.28, p<0.05$.

Criterion validity was tested by examining the ability of each depression measure to distinguish between participants with and without a lifetime diagnosis of MDD. The HDRS ($t(48)=3.23, p=0.002$; Cohen's $d=0.93$) and BDI ($t(48)=3.40, p=0.001$; Cohen's $d=0.98$) both evidenced criterion validity in that they reliably distinguished between participants with and without a lifetime MDD diagnosis, whereas SOPS dysphoric mood ($t(48)=1.37, p=0.18$; Cohen's $d=0.40$) did not significantly distinguish those with MDD (figure 1). All SOPS subscale scores were similar between participants with and without a lifetime MDD diagnosis including positive symptoms (12.6 (4.6) versus 13.6 (5.0), $t(48)=-0.6, p=0.58$; Cohen's $d=0.16$), negative symptoms (13.6 (6.9) versus 14.0 (5.8), $t(48)=-0.2, p=0.83$; Cohen's $d=0.06$), disorganized symptoms (7.7 (3.7) versus 7.9 (3.8), $t(48)=-0.2, p=0.81$; Cohen's $d=0.07$), and general symptoms (9.9 (4.3) versus 7.7 (4.5), $t(48)=1.7, p=0.09$; Cohen's $d=0.49$).

4. Discussion

The current analyses highlight the strengths and weaknesses of the BDI, HDRS, and SOPS dysphoric mood measures in evaluating clinical high risk patients, with implications for the selection of depression measures in future CHR cohort studies and clinical trials. In this sample, internal consistency was adequate for both the HDRS and the BDI, although higher for the BDI. All three measures exhibited convergent construct validity, although the HDRS was additionally associated with the negative symptom subscale and, when including patients taking anti-psychotics, the disorganized symptom subscale (which was also likewise related to SOPS dysphoria). Finally, criterion validity was confirmed for the BDI and HDRS

through significant associations with lifetime MDD diagnosis, but not for the SOPS dysphoria item, which did not differ by diagnostic group.

The BDI is highly reliable in the current sample, with excellent construct validity, suggesting specificity in assessing subjective depressed mood. The BDI's strong psychometric properties, combined with its ease and efficiency of administration, render it a well-suited measure of CHR depressive symptoms. One alternative interpretation, however, is that the narrowly-focused BDI falls short of capturing the breadth of neurovegetative symptoms that constitute depression and over-emphasizes a single dimension of depression (i.e. subjective dysphoria or psychological distress); this is a concern previously noted in studies using the BDI among adolescents with major depressive disorder (Ambrosini et al., 1991; Brooks and Kutcher, 2001).

The construct validity of the HDRS is more complex. Specifically, the HDRS may serve as a broader measure that assesses for depressive syndromes rather than just depressed mood. It is possible, for example, that the HDRS indexes somatic and behavioral aspects of depression that are closely related to Major Depressive Disorder and negative and disorganized symptoms, and are consistent with previously established associations between depression (measured with PANSS and HDRS) and negative symptoms in CHR youth (Corcoran et al., 2011; Perivoliotis et al., 2009). However, in our exploratory analysis of the HDRS subscales, even the depressive subscale was associated with negative and disorganized symptoms, suggesting that this relationship is not entirely driven by the somatic items. Studies using the HDRS that have found depressive symptoms to be related to psychosis outcome and concurrent function therefore may have captured a more general picture that includes negative symptoms and disorganization, although notably the association between HDRS scores and disorganization were no longer significant when excluding the eight respondents taking anti-psychotics. This lack of specificity was previously noted as a weakness of the HDRS when validating the CDSS in adults with schizophrenia, and was part of the justification for developing the CDSS as an alternative depression measure (Addington et al., 1996).

Finally, the SOPS dysphoric mood item may be adequate in measuring the severity of depressive symptoms, based on its correlations with the BDI, HDRS, and depression-related SOPS symptoms, although this is questionable. It fell between the BDI and HDRS in construct validity; it was not correlated with negative symptoms (as was the HDRS) but was associated with disorganization symptoms (unlike the BDI, though similar to the HDRS), but only when including respondents taking anti-psychotics. However, SOPS dysphoric mood was the only one of the three depression measures for which scores did not significantly differ between respondents with and without an MDD diagnosis. Therefore, while it may have some clinical utility in assessing subjective dysphoric mood, based on our data it should not be used as a proxy measure for major depression criteria.

4.1. Method variance

This study compared a self-report measure (BDI) to two clinician-rated measures (HDRS and SOPS dysphoria) of depressive symptoms. Measurement of depressive symptoms may vary by method due to patient and clinician biases in describing symptoms, differences in insight, and personality factors (Corruble et al., 1999). Internal consistency in particular is likely to be higher in self-report measures, as the set of items is standardized across all respondents whereas clinician-rated measures may vary in terms of probes and follow-up questions as clinicians are given freedom to ask probes in whatever fashion they deem useful, thereby introducing random error. A recent meta-analysis suggested that clinicians and researchers may benefit by concurrently employing self-report and clinician-rated measures of depression, particularly noting variation in findings between the BDI and the

HDRS (Cuipers et al., 2010); this is in concurrence with our findings which suggest that the BDI and HDRS may have different strengths in assessing particular aspects of depression.

4.2. Clinical characteristics relative to schizophrenia

Prior studies had examined the validity and reliability of the HDRS and BDI among individuals with threshold psychotic disorders such as schizophrenia, but not in the clinical risk state. Although CHR samples are at elevated risk for schizophrenia, the majority of participants in this and similar cohorts will not develop a psychotic disorder during the follow-up period. Instead, they tend to meet criteria for common mental disorders (Addington et al., 2011), with co-occurring attenuated psychotic symptoms that stabilize or decline in severity over time (DeVylder et al., 2013). Nonetheless, our findings are similar to those in the schizophrenia literature; specifically, the BDI has higher internal consistency relative to the HDRS, and unlike the HDRS, is not associated with negative symptoms.

4.3. Limitations

This study would have been greatly strengthened by the inclusion of additional depression measures, including the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) and especially the CDSS (Addington et al., 1992), a clinician-rated measure that has been employed with clinical high risk cohorts (Addington et al., 2011; Marshall et al., 2012) and which exhibits good construct validity in schizophrenia (Addington et al., 1996; Collins et al., 1996). Discriminant construct validity analysis would have benefited from inclusion of an anxiety measure, which was unavailable for many participants and therefore excluded from this analysis. Criterion validity analysis would have been improved with the use of current rather than lifetime MDD diagnosis. Finally, the comparison of psychometric properties between self-report and clinician-rated measures can be difficult to evaluate because differences between measures may be due to method variance. Future studies examining sex differences in psychometric properties of depression measures (e.g., Chan et al., 2010) are warranted in light of demonstrated sexual dimorphisms in depression (Nolen-Hoeksema, 1987) and psychosis (see Walker et al., 2002), as well as among CHR youth (Corcoran et al., 2011; Rietdijk et al., in press), including with respect to conversion status (Walder et al., 2013). In the current study, the modest sample size and unequal distribution by sex limited ability to assess potential sex differences in psychometric properties. If reliability and validity of these measures do vary by sex then it is also possible that our findings were biased by the greater proportion of males in our sample.

4.4. Conclusions

This study provided comparative psychometric data on several measures of depressive symptoms in a CHR cohort, intended to guide selection of appropriate depressive symptom measures in future studies and in the clinical setting. Both the self-reported BDI and the clinician-rated HDRS may have clinical utility in high risk cohorts given their ability to assess unique aspects of depression (Brown et al., 1995; Steer et al., 1987). The BDI may serve as the more specific and reliable measure of subjective depressed mood, based on its superior internal consistency and discriminant validity, and given its ease of administration may be an especially effective research measure. The HDRS may better assess a more comprehensive depression construct that includes related neurovegetative symptoms, given its associations with negative and disorganized symptoms. Regardless, HDRS results should be interpreted with caution given the potential confounding effect of these negative and related symptoms. The SOPS dysphoric mood item may provide an adequate measure of depressed mood but does not serve as a proxy for the diagnostic criteria for MDD.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

The project described was supported by the National Institute of Health: 1) Center for Research Resources and the National Center for Advancing Translational Sciences, UL1 RR024156 (CMC); 2) K23MH066279 (CMC) 3) R21MH086125-02 (CMC), 4) and the Brain and Behavior Research Foundation (CMC). The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH or BBRF. The authors have no affiliations with industrial or commercial entities and have not received financial support from commercial entities for their work.

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Figure 1. Differences in HDRS, BDI, and SOPS dysphoric mood scores between those with and without diagnoses of major depressive disorder. Note that the range of possible scores varies for each scale. * denotes significance at $p < .05$.

Table 1

Sample demographics, depression diagnosis, and medications

	N = 50
<i>Age (years)</i>	
Mean (SD)	19.7 (3.9)
Median (range)	19 (13–27)
	<u>N (%)</u>
Female	11 (22.0)
Employed/in school	37 (74.0)
<i>Ethnicity</i>	
White, non-Latino	19 (38.0)
Black, non-Latino	6 (12.0)
Latino	21 (42.0)
Asian/Pacific Islander	4 (8.0)
Major depressive disorder	26 (53.1)
<i>Psychotropic medications</i>	
Anti-depressants	14 (28.0)
Anti-psychotics	8 (16.0)

Table 2

Pearson's *r* correlations between depression measures and SOPS items and subscales.

	Mean (sd)	Range	HDRS	BDI	SOPS dysphoria
Convergent Validity:					
Depression measures					
Hamilton Depression Rating Scale	10.6 (6.8)	0–29	-	-	-
Beck Depression Inventory	13.0 (9.7)	0–38	0.56	-	-
SOPS dysphoric mood	2.9 (1.6)	0–5	0.48	0.57	-
SOPS general symptoms (total)	8.8 (4.5)	0–16	0.53	0.60	0.78
SOPS general, excluding dysphoria	6.0 (3.4)	0–12	0.47	0.53	0.56
Sleep disturbance	1.6 (1.7)	0–5	0.31	0.43	0.43
Impaired tolerance to normal stress	3.1 (2.0)	0–6	0.50	0.49	0.65
Discriminant Validity:					
SOPS positive symptoms	12.9 (4.8)	4–22	0.01	-0.23	0.17
SOPS negative symptoms	13.8 (6.3)	0–31	0.33	0.11	0.17
SOPS disorganized symptoms	7.8 (3.7)	1–17	0.32	0.18	0.32

Note: Values for each depression measure column represent Pearson's *r*. Bold font indicates significance at $p < 0.05$, two-tailed tests. Of note, effect size is moderate or better (> 0.30) for all statistically significant correlations.