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Depression in Schizophrenia: Associations With Cognition, Functional Capacity, Everyday Functioning, and Self-Assessment

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Depressed mood has a complex relationship with self-evaluation of personal competence in multiple populations. The absence of depression may be associated with overestimation of abilities, while mild depression seems to lead to accurate self-assessment. Significant depression may lead to underestimation of functioning. In this study, we expand on our previous work by directly comparing the association between different levels of depression, everyday functioning, cognitive and functional capacity performance, and self-assessment of everyday functioning in a large (n = 406) sample of outpatients with schizophrenia. Participants with very low self-reported depression overestimated their everyday functioning compared with informant reports. Higher levels of depression were associated with more accurate self-assessment, but no subgroup of patients underestimated their functioning. Depressive symptom severity was associated with poorer informant-rated social functioning, but there were no differences in vocational functioning, everyday activities, cognitive performance, and functional capacity associated with the severity of self-reported depression. There was minimal evidence of impact of depression on most aspects of everyday functioning and objective test performance and a substantial relationship between depression and accuracy of self-assessment.

Key words: schizophrenia/depression/self-assessment/introspective accuracy/disability/neurocognition/functional capacity

Introduction

People with schizophrenia have long been known to demonstrate deficits in their awareness of illness and ability to self-evaluate their functioning. Studies in the domain of impaired awareness have led researchers to define this phenomenon in schizophrenia in 3 areas: clinical insight or unawareness of illness,[1,2] cognitive insight (ie, presence of maladaptive beliefs[3]), and neurocognitive insight: awareness of neuropsychological dysfunction.[4] It has been found that these domains of impaired awareness, often referred to as introspective accuracy (IA[5]), fail to correlate with each other.[6] Discrepancies between self-reported functioning and ratings generated by clinicians or caregivers predict impairments in everyday functioning; in one recent study, these discrepancies, measured in domains of self-assessed cognition and everyday functioning, were more strongly related to everyday disability rated by informant observers than to performance on measures of cognitive abilities or functional capacity.[4]

The determinants of impaired IA in schizophrenia have been examined previously. Poorer performers on cognitive and functional assessments are more likely to be inaccurate in their self-assessments of cognition and functioning compared with better performers.[7–9] Other candidate predictors have included more severe psychotic symptoms and more severe negative symptoms.[10] Some studies have reported that deficits in certain cognitive abilities, such as executive functioning, correlate with the presence of clinical lack of insight. A recent review concluded that this relationship was consistent, but quite small (meta-analytic r = .16[11]). Thus, cognitive correlates of impaired IA are detectable but not substantial predictors of impairment.

A consistent correlate of IA, across populations, is mood state. Healthy individuals commonly overestimate their abilities and induction of mild depressed mood or receiving deflating feedback tends to correct these overestimates. College students with mild depression are more accurate in self-assessment of their abilities than are those who report no depression, a phenomenon referred to as

"depressive realism."[12] Soderstrom et al[13] found that the depressive realism applied primarily to mild depression, in that individuals with moderate depression were as inaccurate about their everyday functioning as those without self-reported depression, albeit in a different direction of misestimation. A meta-analysis of the "depressive realism" phenomenon[14] found that individuals without depression/dysphoria reported a positive bias that was double that of individuals with depression/dysphoria. This is significant in the case of schizophrenia because depression is very common, with large-scale studies suggesting a lifetime prevalence of major depressive episodes of more than 33%.[15] In people with schizophrenia, data from several different samples suggest that patients who report no depression tend to overestimate their cognitive abilities and everyday functioning. In a recent analysis of the CATIE schizophrenia trial, Siu et al[9] reported that chronic schizophrenia patients who reported extraordinarily high levels of subjective quality of life, in that they said that they were "pleased" or delighted" with their lives, reported depression severity that was negligible and significantly less severe than patients with poorer self-reported quality of life. Those same patients were also rated as lacking clinical insight and performed more much more poorly on tests of executive functioning. Further, in an analysis of a subset of the current data, the severity of self-reported depression was correlated positively with increased awareness of everyday disability.[10]

In patients with major depression, the severity of depression correlates with self-reports of cognitive deficits and self-reported cognitive impairment tracks global clinical response,[16] although these self-reports of cognitive impairments are often found to be uncorrelated with objective cognitive performance even after successful treatment of cognitive deficits.[17,18] Thus, more severe current depression in patients with major depression leads to underestimation of functioning, a finding consistent with the results of a small recent pilot study of patients with bipolar depression.[19] Thus, in mood disorders, more severe depression is associated with greater underestimation of functioning compared with other information and overestimation of cognitive deficits. Similar results were reported in a smaller study of patients with schizophrenia,[7] wherein there was found to be potentially curvilinear relationship between the severity of depression and the overall accuracy of self-assessment of everyday functioning. In that study, patients with the lowest self-reported depression severity overestimated their functioning; patients with the highest levels generated underestimates of their everyday functioning compared with high-contact clinician estimates and patients with mild depression had the most accurate self-assessments.

In this report, we present the results of analyses of a much larger sample of patients with schizophrenia. We examine the convergence between the severity of depression and objectively measured cognitive performance, functional capacity, and everyday functioning in interpersonal, vocational, and everyday activities domains, as well as the association between depression and self-assessment of everyday functioning. Based on previous studies, we also examined the relationship between psychotic symptoms and negative symptoms and self-assessment. We then divided the patients on the basis of their self-reported depression into 3 groups: those with minimal depression, those with substantial depression, and an intermediate group. Comparing the discrepancy between informant ratings and patient self-reports of depression across the 3 samples, we examined the correlation between depression and IA as well as depression and other objective measures.

Methods

Participants

The data are from the Validation of Everyday Real-World Outcomes (VALERO[20,21]) study parts 1 and 2. These 2 study cohorts collected in 3 different geographical areas with the goal of this study being identification of the optimal method for rating real-world everyday functioning among outpatients diagnosed with schizophrenia. The methods used to collect these samples were described in previously in separate articles.[4,21] The study participants were outpatients diagnosed with schizophrenia or schizoaffective disorder and receiving treatment from one of several different service delivery systems in Atlanta, Miami, and San Diego. Atlanta patients were either recruited at a private psychiatric rehabilitation program (Skyland Trail Atlanta) or from the outpatient population at the Atlanta VA Medical Center. San Diego patients were recruited from the UCSD Outpatient Psychiatric Services clinic, a large public mental health clinic, and other local community clinics, or by self-referral. Miami patients were recruited from the outpatient services at the University of Miami Miller School of Medicine. All research participants, including clinical informants, provided signed informed consent according to standards approved by the responsible local Institutional Review Boards. Participants from Atlanta, San Diego, and Miami participated in 1 of 2 phases of the VALERO Study, parts 1 or 2. UCSD and Atlanta patients participated in VALERO 1, and UCSD, Atlanta, and Miami patients participated in VALERO 2, which was started 6 months after the conclusion of data analysis of VALERO 1. These data were collected between July 2007 and July 2012.

All subjects completed a structured diagnostic interview administered by a trained assessor. The Structured Clinical Interview for the DSM (SCID[22]) was used at the Atlanta sites and the Mini-International Neuropsychiatric Interview, 6th Edition (MINI[23]) was used in San Diego and Miami. All diagnoses were verified in local consensus procedures. Screening also included

global cognitive function and premorbid functioning measured with the Mini-Mental State Examination (MMSE[24]) and the Wide Range Achievement Test, 3rd Edition (WRAT-III[25]) Reading subtest. Patients were excluded for a history of traumatic brain injury, brain disease such as seizure disorder or neurodegenerative condition, an MMSE score below 18, or the presence of another Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) diagnosis that would exclude the diagnosis of schizophrenia. However, mood disorder that was a secondary diagnosis was not exclusionary. To capture a comprehensive array of participants reflective of real-world realities, comorbid substance use disorders were not an exclusion criterion. Instead, patients who were believed to be intoxicated were rescheduled. No inpatients were recruited, but patients who resided in a variety of residential facilities including unsupported, supported, or supervised facilities were considered for eligibility. High-contact clinician informants were not screened for psychopathology or substance abuse.

Assessment Strategy

Following screening, the in-person assessments were completed in a fixed order, namely functional capacity assessment followed by a cognitive test battery, and a symptom interview. All raters who administered the Positive and Negative Syndrome Scale (PANSS[26]) received extensive training in administration and every 3 months their performance was reevaluated. Real-world functioning was rated with the same rating scale at each site and the clinician raters did not receive training in generation of these ratings. In VALERO 1, high-contact clinicians in addition to friends or relatives of the patients provided information to a research interviewer who then generated ratings of everyday functioning. In VALERO 2, based on the findings of VALERO 1, the data from a high-contact clinician were the source of information for the functional ratings.

Measures

All participants were assessed with measures examining their performance-based functional capacity, cognitive performance, real-world functioning as assessed by self-reports and informant reports, self-reported depression, clinically assessed schizophrenia symptom severity, and other data not presented in this article.

Real-World Functional Outcomes. As a measure of real-world functional performance, the Specific Levels of Functioning (SLOF[27]) was used. As we reported from the initial phase of the VALERO study,[21] everyday functioning rated with multiple rating scales was found to be related to performance-based assessments of cognition and functional capacity. Of the assessments examined, the SLOF was shown to be the best measure of real-world functioning due to its most favorable correlation with the objective ability measures. The domains of the SLOF include the following: *Interpersonal Functioning* (ie, initiating, accepting, and maintaining social contacts; effectively communicating), independent participation in *Everyday Activities* (shopping, using telephone, paying bills, use of leisure time, use of public transportation), and *Vocational Functioning* (eg, employable skills, level of supervision required to complete tasks, ability to stay on task, completes tasks, punctuality).

As previously reported,[4] high-contact clinicians received no training or guidance in completion of the SLOF. For both VALERO 1 and 2, they were simply provided the form, either in person or by mail, and a consent form and asked to complete the assessment of the patients.

Psychopathology Measures. The 21-item Beck Depression Inventory-II (BDI-II[28]) was used to assess the self-reported severity of depression. This revision is a self-report inventory that is used to assess attitudes and the severity of depressive symptoms, with the higher total scores being indicative of higher severity of depressive symptoms.

The PANSS is widely used for the assessment of psychopathology in schizophrenia. A trained rater who was not the informant for everyday outcomes administered this 30-item interview assessing the severity of positive symptoms, negative symptoms, and general aspects of psychopathology. In a previous study, we found that only 2 of the 30 PANSS items were correlated with any of the 3 elements of functional outcome,[29] with both of these symptoms being negative symptoms. In this study, for purposes of examining the validity of the other clinical assessments, we used the factor analysis-derived PANSS positive and negative symptom subscales[30] to examine the influence the impact of symptoms on the accuracy of self-assessment. We also examined the PANSS depression item in order to examine the convergence between pure self-reports and clinical ratings.

Performance-Based Assessments. Functional Capacity The brief version of the UCSD Performance-based Skills Assessment (UPSA-B[31]) was used to assess functional capacity. Participants performed everyday tasks related to communication and finances. During the Communication role-play measure, participants performed tasks such as using a telephone for making an emergency call; dialing a number from memory; and calling to reschedule a doctor's appointment. For the Finance measure, participants counted change, read a utility bill, and paid the bill by writing and recording a check. The UPSA-B requires approximately 10 min to complete, and raw scores are converted into a total score ranging from

0 to 100. Better functional capacity is reflected in higher scores on the UPSA-B.

Neurocognition We examined neurocognitive performance with a modified version of the MATRICS consensus cognitive battery (MCCB[32]). For this study, we did not include the social cognition measure from the MCCB, the Mayer-Salovey-Caruso Emotional Intelligence Test—Managing Emotions, because social cognition measures may have a different relationship with everyday outcomes compared with neurocognitive measures. This minor modification of the MCCB makes the results similar to previous work, such as our own, that did not include social cognition measures.[33] We calculated a cognitive composite score, an average of 9 age-corrected *T* scores based on the MCCB normative program.

Statistical Approach

We first calculated differences between self-reports of everyday functioning and informant-based ratings, testing them for statistical significance with paired *t* tests, and used Pearson correlations to examine the relationship between these difference scores and self-reported depression. These difference scores were simple subtractions of informant scores from patents self-reports such that higher scores reflect overestimation compared with clinician opinions. Next, we separated the patients into 3 groups based on self-reported levels of depression and compared the 3 groups on demographic variables, self-reported functioning, informant-rated functioning, negative symptoms, functional capacity, and cognitive test performance. These analyses were done with 1-way ANOVA with post hoc follow-up tests. These groupings were based on identification of cutting scores that yielded approximately equal sized groups with evidence of minimal depression (BDI < 9), considerable depression (BDI > 20), and an intermediate group.

Results

Descriptive and demographic information on the participants is presented in table 1, including depression and clinical symptoms. Fifteen percentage of the patients received a diagnosis of schizoaffective disorder and another 15% (not overlapping with the schizoaffective sample) received a secondary lifetime diagnosis of major depression. As noted in our previous publications, we were missing some informant reports of everyday functioning because the clinicians stated that they could not make a valid judgment for some of the items on the everyday activities scale. Rather than impute data or exclude cases, we calculated the average item score for the items that were successfully rated. There were no cases where the clinician informants stated that they could not generate a rating for any of those items, so no cases required exclusion.

Scores for self-reported everyday functioning and informant-based ratings, as well as performance-based assessments, are presented in table 2. In our first analysis, we tested the difference between self-reported everyday functioning across the 3 functional domains and the informant-based ratings. As can be seen in the table 2, participants reported that their everyday functioning was statistically significantly better than the informant ratings indicated on all 3 functional domains. The effect sizes of these differences ranged from moderate to large in the overall sample across all levels of depression severity.

Next, we computed Pearson product-moment correlations between difference scores and positive symptoms, negative symptoms, and BDI scores in the patient sample. In all 3 functional domains, worse depressive symptoms were associated with reduced overestimation of functioning compared with informant judgments: Everyday Activities: $r = -.20$, $P < .001$; Vocational Functioning: $r = -.21$, $P < .001$; and Interpersonal Functioning: $r = -.18$, $P < .001$. However, neither overall positive symptom severity nor negative symptom severity was correlated with any of the estimation scores in any of the 3 domains, all $r < .06$, all $P > .26$. Thus, depression was globally associated with decreased overestimation of functioning compared with informant reports and total positive and negative symptoms were essentially unassociated with self-assessment scores. In order to examine the overall nature of these relationships, we then split the sample into 3 groups based on the severity of their self-reported

Table 1. Demographic and Clinical Variables in the VALERO 1 and 2 Studies

$n = 406$		
Characteristic	*n*	%
Male	268	66
Race		
Caucasian	221	55
African American	154	37
Other or more than 1	31	8
Hispanic ethnicity	73	18
Schizoaffective diagnosis	62	15
Major depression secondary	59	15
Receiving antidepressants	135	33
	Mean	*SD*
Age (y)	42.3	12.2
Education	12.3	2.3
Beck Depression Inventory-II	15.6	11.8
PANSS subscale scores		
Positive	14.6	5.6
Negative	15.5	6.4

Note: PANSS = Positive and Negative Syndrome Scale.

BDI-II scores, with the groups defined by scores of 8 or less, 9–20, and more than 20, as described above.

Table 3 presents the demographic variables, SLOF difference scores, the informant everyday functioning ratings, the UPSA-B and MCCB scores, and the scores on positive and negative symptoms as a function of level of depression severity. There were significant gender differences across groups, with more males in the group who reported minimal depression compared with the other 2 groups. One-way ANOVAs, with Tukey follow-up tests, found that for all 3 SLOF difference scores there were no age differences across the depression severity subsamples. There were statistically significant overall differences in self-assessment as a function of levels of self-reported depression. For Interpersonal Functioning and Everyday Activities, the 2 groups with more severe depression had significantly more accurate self-assessment than the group with minimal depression. For Vocational Functioning, the group with the most depression was more accurate than the group with minimal depression, but the intermediate group did not differ from the other groups. Of note is that none of the groups underestimated their functioning on average for any of the outcomes measures, because no scores were less than 0 (ie, perfect convergence with the informant).

For informant ratings, a different pattern of differences emerged. For Everyday Activities and Vocational

Table 2. Scores on Everyday Outcomes and Performance-Based Tests

	Self-Reported		Informant-Rated				Effect Size
Variable	*M*	*SD*	*M*	*SD*	*t*	*P*	Cohen's *d*
Everyday functioning[a]							
SLOF interpersonal functions	3.6	0.9	3.3	0.9	4.2	.001	0.67
SLOF activities subscale	4.5	0.7	4.2	0.8	3.7	.001	0.43
SLOF vocational subscale	4.0	0.9	3.7	0.9	6.4	.001	0.33
Performance-based variables							
Cognition composite score[b]	37.5	8.4					
UPSA-B score[c]	70.6	14.2					

Note: SLOF = Specific Levels of Functioning; UPSA-B = UCSD Performance-based Skills Assessment.
[a]Mean item score ranges from 1 to 5, higher is better.
[b]*T* score, mean = 50, *SD* = 10.
[c]Range = 0–100.

Table 3. Informant-Rated Everyday Functioning, Discrepancies With Self-Report, Clinical Symptoms, and Performance-Based Measures as a Function of Self-Reported Depression

	BDI < 9		BDI 9–20		BDI > 20			
Variable	*N* = 150		*n* = 127		*n* = 129		X^2 (2)	*P*
% Male	77		53		53		10.46	.001
	M	*SD*	*M*	*SD*	*M*	*SD*	*F*	
Age	41.3	13.0	42.8	12.1	43.7	11.1	1.41	.244
Discrepancy scores								
Interpersonal Functioning	0.4	0.9	0.1	0.9	0.1	0.8	5.10	.007
Everyday Activities	0.5	0.9	0.1	0.9	0.1	0.8	6.34	.002
Vocational Skills	0.5	1.0	0.3	0.8	0.1	0.9	6.31	.002
Informant ratings								
Interpersonal Functioning	3.5	0.9	3.4	0.9	3.1	0.9	6.71	.001
Everyday Activities	4.2	1.0	4.0	0.7	4.3	1.2	0.87	.42
Vocational Skills	3.8	1.0	3.6	0.8	3.7	0.9	1.69	.19
PANSS subscales								
Positive	13.1	5.6	14.2	5.5	15.9	5.5	9.91	.001
Negative	15.2	6.9	14.7	5.8	16.6	6.2	3.19	.042
Depression (item)	1.9	1.2	3.0	1.5	4.1	1.5	85.80	.001
Performance-based assessments								
MCCB	36.2	7.8	37.8	7.0	37.6	7.7	1.98	.14
UPSA-B	70.4	15.5	71.3	13.2	70.5	14.2	0.75	.47

Note: Abbreviations are explained in the first footnote to tables 1 and 2. BDI = Beck Depression Inventory; MCCB = MATRICS consensus cognitive battery.

Functioning, there was no overall difference in informant ratings as a function of depression group. For Interpersonal Functioning, the group with the highest level of self-reported depression was rated as having significantly poorer social functioning than the other 2 groups.

Performance scores on the MCCB and the UPSA-B did not differ as a function of self-reported depression. For both positive and negative symptoms, there were significant overall group differences as a function of depression severity. For positive symptoms, the group with the lowest BDI scores had the least severe positive symptoms with the other 2 groups not differing. Negative symptoms appeared slightly different, as the group with the most severe BDI scores had the highest negative symptoms and the other 2 did not differ. As also shown in the table 3, PANSS depression scores differed significantly as a function of self-reported depression. Tukey tests found that each group was significantly different from the other groups, suggesting that clinically rated depression converged with self-reported depression in this sample. Thus, for all 3 PANSS domains examined, positive, negative, and depression, patients with the lowest BDI scores had the lowest severity of symptoms.

Demographic and Diagnosis Associations With Self-Assessment

As the sex distribution varied as a function of BDI severity, male and female patients were compared for their estimation scores across all 3 functional domains. For all 3 functional domains, the results were the same: male patients had higher scores reflecting more overestimation of functioning, but none of these differences was statistically significant, all $t < 1.03$, all $P > .30$. When similar t tests were performed comparing the patients with schizoaffective disorder to those with schizophrenia, none of the 3 t tests were statistically significant, all $t < 1.2$, all $P > .20$. Similarly, patients with a lifetime secondary diagnosis of major depression also did not differ from those without on any of the 3 self-assessment difference scores, all $t < .45$, all $P > .61$. However, both patients with schizoaffective disorder and a lifetime history of major depression had higher BDI scores than the other patients: $t = 4.1$, $P < .001$ and $t = 3.91$, $P < .001$, respectively.

Discussion

In this study, we found that self-reported depression in people with schizophrenia correlated with the accuracy of self-assessment of everyday functioning. Those with minimal self-reported depression showed evidence of overestimation of their everyday functioning, consistent with previous research, while those with the greatest level of depression provided self-reports that converged with those of high-contact clinicians. Expanding on previous results was the finding that self-reported depression, in the same sample, was not associated with clinician-rated impairments in 2 out of 3 aspects of everyday functioning and was unassociated with performance on tests of cognition and functional capacity. Patients with the lowest self-reported depression scores also had the lowest scores on psychotic and negative symptoms rated on the PANSS. Patients with the greatest tendencies toward over estimation of their functioning had the lowest clinically rated and self-reported symptom severity while not manifesting differential impairments in cognitive functioning. Diagnoses involving mood symptoms were not associated with differences in self-assessment accuracy, possibly because only patients who report essentially no depression consistently manifest overestimation of their functioning compared with clinicians' estimates. An additional finding was that, in contrast to previous studies of patients with major depression and bipolar depression, patients with schizophrenia did not underestimate their everyday functioning regardless of the severity of their depression.

Clinical ratings of depression strongly converged with self-reported depression and there were significant gender effects on self-reported depression, but not on the self-assessment of everyday functioning. Further, about 30% of the patients either had a diagnosis of schizoaffective disorder or a lifetime history of major depression. However, the diagnosis alone did not predict discrepancies in self-assessment compared with clinician reports. These data converge with the results of studies of larger samples[9,15] to indicate that depression is quite common in people with schizophrenia, a finding consistent with the idea that specialized rating scales for depression in schizophrenia are crucial.[34] However, the findings across completely nonoverlapping samples (Siu et al[9] and the present sample) suggest that the nearly complete absence of self-reported depression in schizophrenia may be a signal of the presence of problems in the ability to realistically evaluate both global life situations and specific functional skills. In the Siu et al study, patients with minimal self-reported depression provided self-reports of the their global quality of life that were extraordinarily positive. Those same patients were clinically rated as lacking in insight. In the present study, patients who reported minimal depression and better functional outcomes than their clinicians observed were found to perform similarly on objective measures of cognition and functional capacity to those patients who accurately reported that they were more impaired in everyday functioning. Thus, a self-report of no depression or other distress in the context of a lifelong psychotic condition may be a sign that further assessment is required and likely does not indicate that the patient has no functional limitations and is living in a positive situation.

In a very recent report coming from a large-scale study in Italy, the severity of depression was found to be associated with clinical insight into illness. In that study,[35] scores on the Calgary Depression scale[34] were found to

correlate substantially with clinical unawareness measured by the Scale for Unawareness of Mental Disorders (SUMD[2]). These findings complement those of the present study, which suggests that depression is associated with increased awareness of functional limitations. Those authors also found that the correlations were strongest among patients with other disadvantages, such as severe illness and limited resources. Historically, patients with the deficit syndrome marked by primary negative symptoms have more impaired social functioning, less severe depression, and less subjective distress regarding impairments in functioning.[36] This is consistent with our findings from another sample of schizophrenia patients, wherein social amotivation exerted a substantial effect on objective social outcomes that was not related to mood symptoms.[37]

The finding that depression does not correlate with impairments in performance-based tests may seem implausible. However, a careful examination of the research literature on cognition in major depression reveals quite similar findings. In 2 separate studies of treatment of cognition in major depression, improvements in self-reported cognitive functioning closely tracked clinically rated improvements in depression and, in one of the studies, were remarkably uncorrelated with changes in cognition measured with performance-based tests. In the McIntyre et al[17] study, patients who achieved clinical remission did not improve more on objective cognitive tests than patients who did not achieve remission or even manifested nonresponse. In contrast, in the study by Baer et al,[38] remitters reported that they improved on cognition significantly more than nonremitters; the effect was significant on 15/15 subjective report indices. Similar findings have been reported in post-traumatic stress disorder, wherein objective measures of cognition and functional capacity did not correlate with self-reported disability, which was instead highly predicted by current level of symptoms, including self-reported depression.[39]

There are some limitations in these results. Social cognition was not thoroughly assessed and social cognition, in concert with negative symptoms and social competence, is a strong predictor of social outcomes.[37,40] Participants were not selected for the presence or absence of depression, although the mean depression scores for these patients were considerable on average. At the same time, the patients in our most severe depression group could have had only moderate levels of depression. Severe depression could possibly have led to underestimation of functioning. Other than depression, other clinical symptom severity was not that substantial. While not detracting from the findings regarding depression and self-assessment, it may be the case that other symptoms would have a more substantial impact on self-assessment in more symptomatic patients. Individual BDI items were not entered into the database, which made a dimensional examination of depression impossible. This is not a longitudinal study, so we cannot determine what the result on either functioning or self-assessment would be if depression was successfully treated. Further, although we assume that clinician reports of functioning have validity on the basis of previous publications in these samples showing between clinician ratings and performance-based assessments[4,40] and no impact of depression on these correlations, we do not know to what extent clinician impressions of functioning are impacted by depression in general.

Our results, in a large sample of schizophrenia outpatients, suggest that depressive symptoms are common in people with schizophrenia and do not have relationships with objective measures of neurocognition and functional capacity, or with clinician ratings of everyday functioning. Very low levels of subjective depression may signal significant difficulty in self-rating level of everyday functioning and objective abilities.[41] Thus, informant ratings may be required for establishing an accurate level of functional impairment in schizophrenia and other neuropsychiatric conditions.

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