



Performance-based assessment of functional skills in severe mental illness: Results of a large-scale study in China

Belinda J. McIntosh^a, Xiang Yang Zhang^b, Thomas Kosten^b, Shu Ping Tan^c, Mei Hong Xiu^c, Jeffrey Rakofsky^a, Philip D. Harvey^{d,*}

^a Emory University School of Medicine, USA

^b Baylor University School of Medicine, USA

^c Beijing Hui-Long-Guan Hospital, China

^d Department of Psychiatry and Behavioral Sciences, University of Miami Miller School of Medicine, Clinical Research Building, 1120 NW 14th Street, Suite 1420, Miami, FL 33136, USA

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ABSTRACT

Performance-based assessments of everyday living skills have been shown to be highly correlated with cognitive functioning in schizophrenia and bipolar disorder, as well as being predictive of deficits in real-world outcomes such as independent living and employment. In this study, we expand our assessments of impairments in everyday living skills to China, evaluating people with schizophrenia, bipolar disorder, and major depression, and comparing their performance to that of healthy controls. Samples of people with schizophrenia ($n = 272$), bipolar disorder ($n = 61$), major depression ($n = 50$), and healthy controls ($n = 284$) were examined with the Chinese version of the UCSD performance-based assessment, brief version (UPSA-B). Performance was compared across the groups and the association between age, gender, educational attainment, marital status, and UPSA-B scores was evaluated. When the performance on the UPSA was compared across the groups, with education as a covariate, significant effects of both diagnosis ($F = 86.3$, $p < .001$) and education were found ($F = 228.3$, $p < .001$). Sex and age did not contribute significantly when age and education were considered. Post-hoc comparisons revealed that total UPSA-B scores were lowest in the schizophrenia patients, followed by the patients with major depression. Patients with bipolar disorder did not differ from the healthy comparison subjects on overall performance. Scores for all groups were lower than previously reported in western samples (e.g., HC mean = 64). While diagnostic differences in UPSA-B scores are similar to those previously seen in western samples, the education effect is considerably more substantial. These data suggest that in developing countries educational attainment may be strongly associated with levels of adaptive outcomes and the utilization and interpretation of functional capacity measures be adjusted accordingly.

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1. Introduction

Disability is associated with all major mental illnesses, including major depression, bipolar disorder, and schizophrenia. In schizophrenia, substantial deficits in everyday functioning are common and related to cognitive deficits (Green et al., 2000). Global deficits as well as impairments in specific cognitive functioning domains have been reported (Dickinson et al., 2008; Reichenberg and Harvey, 2007; Leung et al., 2008). These impairments include deficits in episodic memory (Ranganath et al., 2008), processing speed (Dickinson et al., 2007), and executive functioning, including working memory (Reichenberg and Harvey, 2007; Lee and Park,

2005). In unipolar depression impairments in memory, visual-motor speed (Austin et al., 1992), attentional set shifting, and sustained motor responses have been observed during acute episodes (Purcell et al., 1997), while during remission deficits in measures of visual-motor sequencing, executive function, immediate memory, and attention have been seen (Paradiso et al., 1997). In bipolar disorder impairments in verbal memory and executive functioning tasks have been reported in episodes of mania, depression and, euthymia (Martinez-Aran et al., 2004a,b; Zubietta et al., 2001).

While there has been an increasing literature on cognitive impairments in these patient populations, fewer studies have focused on functional impairments and disability. Studies of functional impairment in unipolar depression reveal that real-world disability increases during episodes of depression but can return to a reduced level of impairment during remission. In one such study, functioning in everyday activities improved with remission, but

* Corresponding author.

E-mail address: pharvey@med.miami.edu (P.D. Harvey).

social functioning remained impaired (Spijker et al., 2004). Others have observed that functional impairments are both severe and widespread, affecting marital quality, income, occupation, and education even in depressed patients who have sustained a two year remission (Coryell et al., 1993). Severity of depression and anxiety symptoms (Naismith et al., 2007; Spijker et al., 2004), cumulative history of depression, time spent depressed, psychiatric comorbidities, personality traits, and perceived social support (Rytsala et al., 2006) have all been associated with real-world functional impairments in persons with unipolar depression. Studies of functional impairment in bipolar disorder reveal a similar extent of severe, enduring psychosocial disability (Huxley and Baldessarini, 2007). Predictors of functional impairment include poorer performance on tests of cognitive function (Wingo et al., 2009), total number of mood episodes (Martinez-Aran et al., 2004a), extent of symptom remission, substance abuse (Dickerson et al., 2010), symptom severity, history of psychiatric hospitalizations, and maternal education (Dickerson et al., 2004).

Recent advances in the assessment of disability in persons with severe mental illness have separated the measurement of the *ability* to perform everyday adaptive skills (referred to herein as “functional capacity”) from real-world functional outcomes, yielding a more precise set of predictors of outcome (Harvey et al., 2007). In two studies of large samples of schizophrenia and bipolar patients, deficits on performance-based measures of everyday functioning efficiently predicted real-world functional impairments. In the first (Mausbach et al., 2010), performance on a brief version (UPSA-B; Mausbach et al., 2007) of the UCSD performance-based skills assessment (UPSA; Patterson et al., 2001) predicted the level of residential independence in the combined sample, with diagnosis (schizophrenia vs. bipolar) adding no incremental predictive power. The second study (Bowie et al., 2010) found that performance on the UPSA-B was a strong predictor of real-world outcomes in both patient samples, with minimal differences in the functional, cognitive, and symptomatic determinants of real-world functioning across the two diagnoses. Interestingly, the severity of both schizophrenia and bipolar (mania and depression) symptoms was correlated with real-world functional deficits in a manner independent of performance on the UPSA.

Some evidence has suggested that substantial differences in environmental conditions may have a minimal impact on performance-based measures of functional capacity and cognition. In a cross national study of schizophrenia patients in the United States and Sweden (Harvey et al., 2009), no differences were found in functional capacity, cognitive performance, and clinician ratings of the ability to perform everyday living skills. In the same sample, residential independence varied significantly between the two countries, suggesting that performance-based measures may be less influenced by environmental factors than real-world outcomes. The interaction between cultural differences and everyday functioning in schizophrenia has been studied previously. Outcome in schizophrenia has been suggested to vary significantly between “lower and middle income” countries when compared to “high income” Western countries (Isaac et al., 2007). However, in a study of Chinese patients in Hong Kong, Au et al. (2005) found that when they translated a real-world functioning scale, the St Louis Inventory of Community Living skills into Chinese, the scale was able to discriminate between patients discharged to different levels of community care. Further, in a study in Taiwan Jhang (1999) reported that patients with bipolar disorder had substantial residual disability after clinical recovery, suggesting that the characteristics of disability in bipolar disorder in Chinese patients seem similar to those reported in Western Cultures.

There have been no studies to date on functional capacity measures in schizophrenia patients in China and certainly no

studies comparing healthy individuals to multiple samples of patients with different variants of severe mental illness. While the studies cited above suggest that functional disability associated with severe mental illness have similar characteristics, there are possible reasons that functional capacity measures would require careful consideration in Chinese samples. Individuals with low levels of educational and vocational attainment, even without any evidence of mental illness, would be expected to be less likely to have experience with banking and using the telephone, both of which are central features of the UPSA-B. These differences may impact on performance on functional capacity measures and require this issue requires direct study in order to determine how these measures should be adjusted for use across different countries and cultures.

In this paper we present the results of a study measuring functional capacity in patients with schizophrenia, bipolar disorder, and major depression living in Beijing, China using a translated and culturally adapted version of the UPSA-B. Further, we examined a large sample of healthy individuals in order to understand normative performance on these ability measures in Beijing. We hypothesized that impairments in functional capacity are a central feature of severe mental illness, as indexed by a relative impairment in performance for the patient groups compared to the healthy sample. We also took advantage of the wide variation in educational attainment in this sample to examine whether level of education, as well as other demographic factors, influenced performance on functional capacity measures. As performance-based ability measures are used as outcome measures in clinical treatment studies (Green et al., 2008), understanding their characteristics across different countries and cultures may help inform treatment of schizophrenia and bipolar illness. We expected that education would also have a notable impact on UPSA-B scores and were interested in whether this impact interacted with the presence of serious mental illness.

2. Method

2.1. Participants

Patient participants in this study met criteria for schizophrenia, bipolar disorder, or major depression (DSM-IV). Physically healthy patients who met DSM-IV (American Psychiatric Association, 2000) for schizophrenia, bipolar disorder and major depression were compared with 284 Chinese normal controls. All patients were recruited from among the inpatients of Beijing Hui-Long-Guan Hospital, a Beijing City owned psychiatric hospital. Diagnoses were made for each patient by two independent experienced psychiatrists and utilized structured interviews (a translated version of the SCID; First et al., 1995), access to detailed medical records, and relied on the DSM-IV criteria. Healthy controls were recruited from the local community, and selected for similarity to the patients in age and gender. Current mental status and personal or family history of any mental disorder was assessed by a clinical psychiatrist. None of the healthy control subjects presented a personal or family history of psychiatric disorder. All subjects were Han Chinese being recruited at the same period from the Beijing area.

A complete medical history and physical examination were obtained from all subjects. Any subjects with physical abnormalities were excluded. Neither the patients nor the control subjects suffered from drug or alcohol abuse/dependence. All subjects gave signed, informed consent to participate in the study, which was approved by the Institutional Review Board, Beijing Hui-Long-Guan hospital. Three hundred patients with schizophrenia, 70 patients with bipolar disorder and 60 patients with major depression were approached on inpatient units at the hospital. As far as agreement

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