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Health status and mobility limitations are associated with residential and employment status in schizophrenia and bipolar disorder

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ABSTRACT

Introduction: Schizophrenia (SCZ) and bipolar disorder (BP) are linked to multiple impairments in everyday functioning which share cognitive and symptom risk factors. Other risk factors for critical aspects of every day functioning (e.g., gainful employment; residential independence) such as physical health have not been evaluated, despite poor health in SCZ and BP.

Methods: We analyzed 20-year follow-up data from the Suffolk County Mental Health Project cohort of consecutive first admissions with a psychotic disorder to 12 psychiatric facilities in Suffolk County, NY, between September 1989 and December 1995. Both 20-year symptom, health, and cognition data, and the 20-year course of weight gain were included as predictors of employment and residence status.

Results: The analysis sample consisted of 122 participants with SCZ ad BP, with SCZ participants less likely to work or live independently. Correlational analyses showed symptoms and cognition predicted vocational outcomes in both samples. The effect of diagnosis was significant for both gainful employment and independence in residence. After consideration of diagnosis, mobility and negative symptoms predicted gainful employment in both samples, but there were no additional predictors of residential independence. Prospective analysis of BMI found that baseline BMI, but not changes during the 20-year follow up, predicted labor force participation.

Discussion: Health status limitations were associated with residential and, particularly, employment status independent from other, previously established predictors of everyday outcomes, including cognition and symptoms. The importance of health status limitations for predicting outcome was confirmed in both SCZ and BP, with schizophrenia representing the more impaired group.

1. Introduction

Severe and persistent mental illnesses (SPMI), including schizophrenia (SCZ) and bipolar disorder (BP), are associated with high rates of disability in the US and worldwide (Kim et al., 2010; Murray et al., 2013; Whiteford et al., 2010). Despite the striking nature of psychotic and manic symptoms, the costliest impairments include wide-ranging limitations in critical areas of daily functioning, particularly in the ability to live and work independently (Huxley and Baldessarini, 2007; McEvoy, 2007; Jin and McCrone, 2015), which is lower than population norms (Harvey, 2009; Harvey et al., 2010).

Disability is a complex construct attributable to a cascade of multiple interdependent influences. In SPMI, known determinants of disability include cognitive deficits, which are indexed by performance on neuropsychological tests, and other specific symptoms (e.g., enduring negative symptoms, treatment refractory psychosis, or recurrent episodes of mania or depression). However, even in combination with impairments in performance-based measures of functional capacity ("skills deficits"), these predictors account for less than 50% of the total variance, suggesting that other, unexplored factors contribute to the high rates of disability in SPMI (Bowie et al., 2006, 2008, 2010).

Previous studies of BP and SCZ have found that predictors of daily functional outcomes are similar in the two patient

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populations (Bowie et al., 2010; Mausbach et al., 2010). However, when compared to BP patients, individuals with SCZ have poorer residential outcomes and performance on measures of daily living skills, lower educational achievement, and greater impairment in clinician ratings of everyday outcomes (Mausbach et al., 2010; Meyer et al., 2014; Velthorst et al., 2016). These cross-diagnostic relative levels of impairments hold across different countries and cultures (McIntosh et al., 2011), although the correlations between skills deficits and outcomes seems quite consistent on a cross-national basis.

Given the high prevalence of obesity (De Hert et al., 2009; Allison et al., 2009; Fagiolini et al., 2008) and poor physical functioning in individuals with SPMI (Vancampfort et al., 2017; Strassnig et al., 2014), we hypothesized that physical health limitations may have an even greater influence on disability in SPMI groups than in mentally healthy individuals (Scott et al., 2009) (Fig. 1). Individuals with SPMI often have a poor diet, are sedentary, engage in little or no physical exercise, and are persistent smokers (Newcomer and Hennekens, 2007), and these risk factors are exacerbated by cognitive deficits and clinical symptoms (Harvey and Strassnig, 2012), as well as chronic treatment with sedating and obesogenic psychotropic medications.

We know of no studies of the SPMI population that have examined the relationships of obesity and physical functioning, together with cognitive impairments and clinical symptom severity, to the ability to live independently or sustain employment. In this paper, we examine these relationships using data from a well-characterized sample that was followed for 20 years after first hospitalization for a psychotic episode. We also used these data to assess whether people with BP and SCZ show similar associations between clinical, cognitive, and physical variables and daily functioning.

2. Methods

All participants provided written informed consent at the initial and subsequent assessments. Inclusion criteria were age 15–60 years, residence in Suffolk County NY, and psychosis not due to a medical condition. Exclusion criteria were a psychiatric hospitalization more than 6 months before the index admission, more than borderline intellectual disability (IQ < 70), inability to provide informed consent, and being a non-English speaker. The data were collected at 6 months, and 2, 4, 10, and 20 years after the index assessment.

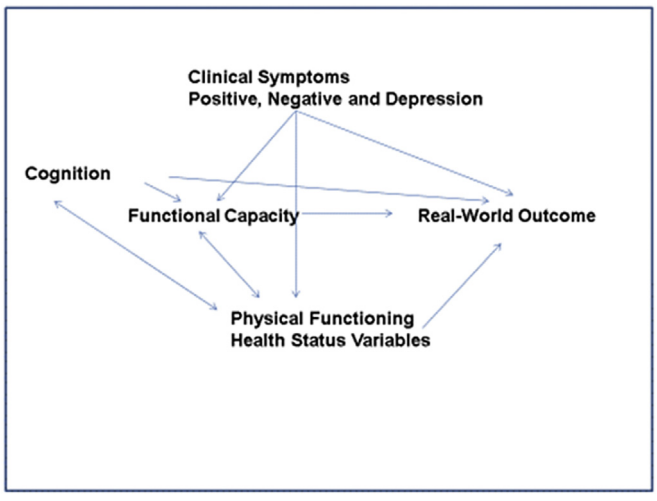

Fig. 1. Physical health and functioning predict disability in SMI.

Twenty-year follow up measures of cognitive performance, psychiatric symptoms, and physical performance were analyzed in study participants with a 10-year follow up diagnosis of SCZ or BP.

The Structured Clinical Interview for DSM-III-R (SCID: Spitzer et al., 1990) was administered during the baseline, 6-month, and 2-year follow ups, and the SCID for DSM-IV was administered at year 10 (Bromet et al., 2011). Based on the SCIDs, medical record information, and interviews with significant others, longitudinal DSM-IV consensus diagnoses for each participant was reached (Bromet et al., 1992, 2011). In this analysis, we used the 10-year follow up diagnosis, which was the most recent available.

2.1. Clinical and health measures

The cross-sectional, 20-year clinical and health correlates included: Scale for Assessment of Negative Symptoms and Scale for Assessment of Positive Symptoms (SANS and SAPS; Andreasen, 1984a,b); cognitive functioning (see below); waist circumference, and physical functioning measured by chair rise ability, a task developed originally to test physical performance in geriatric samples with the Short Physical Performance Battery (Guralnik et al., 1994) for the Centers for Disease Control and Prevention (Guralnik et al., 1996). This battery is used widely in epidemiological research to determine basic physical functioning (Rikli and Jones, 1999). Chair Stand Tests serve as a proxy measure for lower extremity strength that is pivotal for daily functional performance (Brown et al., 1995). Because of concern for potential ceiling effects in our younger, non-geriatric population, we used a modified, expanded test: participants were asked to rise from a chair ten times as fast as possible with their arms folded across their chests rather than five times, as required in the original SPPB. We recorded the total time required to rise from the chair ten times to obtain a continuous score, which was then scaled with a formula (70-T)/70. These Expanded Timed Repeated Chair Stands were completed with 104 (81.3%) of the 128 participants.

To assess cognitive functioning, participants completed a comprehensive battery of cognitive tests at the 20-year assessment that represent eight major ability areas (Mojtabai et al., 2000; Reichenberg et al., 2009). For general verbal ability, we used the Wechsler Adult Intelligence Scale-Revised (WAIS-R) Vocabulary and Information subtest; for verbal declarative memory, the Wechsler Memory Scale-Revised (WAIS-R) Verbal Paired Associates I and II; for visual declarative memory, the WMS-R Visual Reproduction I and II; for executive function, the Stroop Color-Word Test, time on part B of the Trail Making Test, and for working memory, Letter Number Span and digit span. For processing speed, we used the time on part A of the Trail Making Test; for visual processing, the Facial Recognition Test, and for language ability, Letter Fluency. We converted all raw scores on these cognitive tests to standardized (z) scores for the current population sample, and an overall summary measure was computed, as described in the statistical methods.

Longitudinal physical health was assessed with the body mass index (BMI), calculated at each assessment beginning at the 6-month follow up assessment. Weight and height were self-reported except at the 20-year assessment, when they were measured directly. This led to the calculation of a BMI score for each participant at each assessment (kg/m^2).

2.2. Outcome measures

Two interviewer-coded measures were included: residential independence (defined as living fully independently without any external support, such as group homes or supported settings) and