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Original article

Predictive factors of functional capacity and real-world functioning in patients with schizophrenia

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ABSTRACT

Purpose: This study was performed to identify the predictive factors of functional capacity assessed by the Spanish University of California Performance Skills Assessment (Sp-UPSA) and real-world functioning assessed by the Spanish Personal and Social Performance scale (PSP) in outpatients with schizophrenia.
Methods: Naturalistic, 6-month follow-up, multicentre, validation study. Here, we report data on 139 patients with schizophrenia at their baseline visit. Assessment: Positive and Negative Syndrome Scale (PANSS), Clinical Global Impression-Severity (CGI-S), Sp-UPSA and PSP. Statistics: Pearson's correlation coefficient (r) was used to determine the relationships between variables, and multivariable stepwise linear regression analyses to identify predictive variables of Sp-UPSA and PSP total scores.
Results: Functional capacity: scores on the PSP and PANSS-GP entered first and second at $P < 0.0001$ and accounted for 21% of variance ($R^2 = 0.208$, model $df = 2$, $F = 15.724$, $P < 0.0001$). Real-world functioning: scores on the CGI-S ($B = -5.406$), PANSS-N ($B = -0.657$) and Sp-UPSA ($B = 0.230$) entered first, second and third, and accounted for 51% of variance (model $df = 3$, $F = 37.741$, $P < 0.0001$).
Conclusion: In patients with schizophrenia, functional capacity and real-world functioning are two related but different constructs. Each one predicts the other along with other factors; general psychopathology for functional capacity, and severity of the illness and negative symptoms for real-world functioning. These findings have important clinical implications: (1) both types of functioning should be assessed in patients with schizophrenia and (2) strategies for improving them should be different.

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1. Introduction

Schizophrenia is a chronic and disabling mental disorder that frequently leads to substantial deficits in personal, social and occupational functioning. In high-income countries, in people under 60 years of age, it ranks 7th on the list of leading health conditions associated with moderate and severe disability [37]. There is agreement that functional outcomes should be related to abilities or skills that are essential to an individual's ability to function independently in the community [20]. These everyday adaptive skills include general organization, communication skills, finance management, transportation, performance of household chores, medication management and social interactions with others [20,31,7,28]. With respect to them, there is an important distinction between the ability to perform these skills under optimal conditions, called functional capacity, and the patient's actual performance in real life, called real-world functioning [17,29,36].

The discrepancy between what a person can do and what that person actually does can be predicted by multiple factors [12]. It has been proposed that real-world functioning is predicted by

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functional capacity [4,21] but many other clinical, motivational and environmental factors may influence functional performance in everyday life [16]. In addition, prior experience with everyday adaptive skills play a more prominent role in predicting real-world functioning than functional capacity, meaning that these skills may be learned but not utilized [22].

It has been also shown that different factors may predict real-world functioning in different major functional domains [16,15]. In this sense, in the interpersonal relationships domain, both the severity of negative and depressive symptoms as the presence of these symptoms in a residual manner have significant and negative effects that are independent of functional capacity [4,6,3]. On the other hand, cognitive impairments and negative symptoms have been pointed out as the most consistent predictors of disability in different studies [15,34,35]. A certain specificity of their negative impact on functioning has been suggested, i.e. that while cognitive deficits have the greatest impact on residential and vocational dimensions of functioning [15] by reducing the ability to perform critical everyday functional skills [18], negative symptoms show the greatest impact on interpersonal skills and social functioning [4,6,18]. Furthermore among negative symptoms, expressive deficits (alogia and blunted affect) and subjective experiences (amotivation, anhedonia and asociality) would have different impact on real-world functioning. In this sense, a recent study found that while expressive deficits did not have impact on real-world functioning, avolition was the strongest predictor of interpersonal relations and social network [33].

Taking into account this complex background and due to the fact that the majority of the studies included a limited number of variables, we decided to examine in more depth the relationships between age and gender, psychopathology, severity of the illness, functional pragmatic variables (i.e., civil status, education, working status, mental disability benefit), functional capacity, and real-world functioning. The aim of our study is to identify those factors predicting both functional capacity and real-world functioning in outpatients with stable schizophrenia. Furthermore, we will also identify the specific variables contributing to the prediction of each of the different areas of the real-world functioning. We hypothesize that the variables included in our study will have different contribution to the prediction of each construct. While receiving a mental disability benefit, and psychopathological and functional capacity variables will be the strongest predictors of real-world functioning and its areas, education (years of education and level of education), age and real-world functioning will be of functional capacity.

2. Methods

2.1. Study Design

Data displayed in this paper are from a naturalistic, 6-month follow-up, multicentre, validation study in outpatients with schizophrenia and bipolar disorder conducted at 7 sites in Spain [9]. Here we report data only on patients with schizophrenia obtained at their baseline visit. It was approved by the Clinical Research Ethics Committee of one of the sites, Hospital Universitario Central de Asturias, Oviedo, Spain and conducted in accordance with the 1975 Declaration of Helsinki as revised in 1983. Written informed consent was obtained from all subjects prior to enrolment.

2.2. Subjects

Participants included 139 outpatients with stable schizophrenia defined as those patients who were clinically stable and did not require any change in their current pharmacological treatment during the past 3 months.

Patient inclusion criteria were:

- age $\geq$ 18 years;
- ICD-10 diagnosis of schizophrenia spectrum disorder;
- currently on outpatient treatment for his/her illness and;
- written informed consent to participate in the study.

Exclusion criteria were designed to be minimal due to the design of the study and consisted only of patients with intellectual developmental disorder or acquired brain injury, or refusal to participate in the study.

2.3. Clinical measures

Demographic and clinical data were collected. The Spanish versions of the Positive and Negative Syndrome Scale (PANSS) [32] and the Clinical Global Impression-Severity (CGI-S) [13] were used to assess psychopathology. Functional capacity was assessed by means of the Spanish version of the University of California Performance-based Skills Assessment (Sp-UPSA) [9] and real-world functioning using the Spanish version of the Personal and Social Performance Scale (PSP) [10].

The PSP [30] is a clinician-rated instrument that evaluates patient functioning in the following 4 areas:

- self-care;
- socially useful activities including work and study;
- personal and social relationships and;
- disturbing and aggressive behaviours.

It provides scores in each of the 4 areas where higher scores indicate worse functioning, and a single global score ranging from 0 to 100 where higher scores reflect better personal and social functioning.

The UPSA [31] measures functional capacity. Participants engage in role-play or respond to stimulus items in four domains of functioning:

- finance;
- communication;
- planning recreational activities and;
- transportation.

Each of these domains generates a raw score that is converted to a domain score ranging from 0 to 25 points. The sum of the four domain scores yields a total score potentially ranging from 0 to 100 points, where higher scores indicates better performance.

2.4. Statistical analysis

The statistical analysis was done using SPSS 17.0. The two-tailed level of significance used was 0.05. Student's t and Chi^2 tests were used to determine statistically significant differences according to demographic, clinical and functional status. We used the Pearson's correlation coefficient (r) to determine the relationships between variables. Finally we performed a multivariable stepwise linear regression analysis to identify predictive variables of functional capacity (Sp-UPSA total score) and real-world functioning (PSP total score, and scores on each of its 4 areas). Specifically in the case of the Sp-UPSA a stepwise regression analysis was performed with the following independent variables: age, scores on the clinical scales [PANSS-P, PANSS-N, PANSS-MNF (PANSS-Marder Negative Factor) [27], PANSS-GP, PANSS-AnxDep

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