

## ORIGINAL ARTICLE

# Outcomes of inpatients with severe mental illness: a naturalistic descriptive study

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**Objective:** To describe and evaluate the response and predictors of remission during inpatient treatment in a psychiatric unit in a general hospital based on symptomatology, functionality, and quality of life (QoL).

**Methods:** Patients were admitted to a psychiatric unit in a tertiary general hospital in Brazil from June 2011 to December 2013 and included in the study if they met two of the severe mental illness (SMI) criteria: Global Assessment of Functioning (GAF)  $\leq 50$  and duration of service contact  $\geq 2$  years. Patients were assessed by the Brief Psychiatric Rating Scale (BPRS), the Clinical Global Impression (CGI) Severity Scale, GAF, the World Health Organization Quality of Life Instrument – Abbreviated version (WHOQOL-Bref), and specific diagnostic scales.

**Results:** A total of 239 patients were included. BPRS mean scores were  $25.54 \pm 11.37$  at admission and  $10.96 \pm 8.11$  at discharge ( $p < 0.001$ ). Patients with manic episodes (odds ratio: 4.03; 95% confidence interval: 1.14-14.30;  $p = 0.03$ ) were more likely to achieve remission (CGI  $\leq 2$  at discharge) than those with depressive episodes. Mean length of stay was  $28.95 \pm 19.86$  days. All QoL domains improved significantly in the whole sample.

**Conclusion:** SMI patients had marked improvements in symptomatic and functional measures during psychiatric hospitalization. Patients with manic episodes had higher chance of remission according to the CGI.

**Keywords:** Severe mental illness; inpatient treatment; psychiatric hospitalization; quality of life

## Introduction

One of the definitions of severe mental illness (SMI) is based on two major National Institute of Mental Health (NIMH) criteria<sup>1</sup>: 1) duration, characterized as “prolonged illness” and “long-term treatment” with a history of mental illness or treatment equal to or greater than 2 years; and 2) disability, which includes dangerous or disturbing social behavior, moderate impairment of work and non-work activities, and mild impairment in the performance of activities of daily living and in the fulfillment of basic needs.<sup>2,3</sup> SMI accounts for significant functional impairment, higher public health spending, and poorer quality of life (QoL). Population studies suggest that SMI patients die earlier, specifically from injuries and suicide.<sup>4</sup> SMI is a risk factor for chronic disorders, such as smoking, low physical activity levels, poor diet, and accidental and non-accidental injuries.<sup>5</sup>

Psychiatric hospitalization has been offered as a therapeutic strategy for acute cases and remains a key component of mental health care.<sup>6</sup> Acute psychiatric inpatient treatment represents the most intensive level of psychiatric care, whose goal is the stabilization of highly acute and severe psychiatric conditions associated with

danger to self or others and/or marked functional impairment. Usually, acute inpatient treatment within an integrated community-based health system consists mainly of crisis stabilization and safety.<sup>7</sup> Consequently, it focuses on rapid discharge and, within a “balanced care model,” patients are usually admitted to acute wards in general hospitals,<sup>8</sup> which helps minimize the associated stigma and allows easier access to exams.<sup>9</sup>

The number of psychiatric beds has decreased in many countries, such as the United States<sup>7</sup> and Brazil,<sup>10</sup> in recent decades. In the 1970s, there were approximately 500,000 psychiatric beds in the United States, 80% of which were in psychiatric institutions (hospitals). The total number of psychiatric beds decreased by about 50% up to 2002.<sup>7</sup> Before the 21st century, psychiatric care in Brazil was mainly based on a centralized model with large psychiatric hospitals, longer length of stay, and poor community care, provided mostly by outpatient clinics, with exiguous psychiatric care in general hospitals. Changes in Brazilian healthcare policies led to the implementation of deinstitutionalization programs, financing of new community centers (such as Psychosocial Community Centers [CAPS], which provide day hospital care for severe mental disorders<sup>11</sup>), cuts in hospital care expenses, and use of high-priced medications in outpatient care.<sup>12</sup> However, there is still a shortage of psychiatric beds in the Brazilian public health sector.<sup>10</sup>

Previous naturalistic studies reported outcomes during psychiatric inpatient care. A previous study in Brazil revealed that age and employment status were significant

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predictors of inpatients' treatment non-response in a general hospital unit while 80% of the sample benefited from hospitalization, despite the lack of standard evaluations.<sup>13</sup> In a study of schizophrenic inpatients, Spellmann et al.<sup>14</sup> showed statistically significant improvements from admission to discharge using Global Assessment of Functioning (GAF) and the Social and Occupational Functioning Assessment Scale to assess functional status and the Positive and Negative Syndrome Scale (PANSS) to evaluate symptoms. Their study demonstrated that unemployed patients had a significantly worse functional outcome at discharge and that the lower number of previous hospitalizations and PANSS negative symptom scores at admission had a better prognosis in terms of functional outcome after 1 year. By using the Hamilton Depression Rating Scale (HAM-D), the Montgomery-Åsberg Rating Scale, the Clinical Global Impression (CGI) scale, GAF, and Lancashire QoL Profile, Seemüller et al.<sup>15</sup> reported a 68.9% response rate with 51.9% remission in depressed inpatients. The Munich Antidepressant Response Signature (MARS) project<sup>16</sup> evaluated the outcomes of inpatients clinically diagnosed with depression using 21 HAM-D items, the Hamilton Anxiety Rating Scale (HAM-A), and the revised version of the self-rating Symptom Checklist-90. Most patients benefited from antidepressant treatment during hospitalization (80.8% responded and 57.9% achieved remission in HAM-D) and early partial response was a positive predictor of remission. Treatment resistance and the presence of a migration background were negative predictors.<sup>16</sup> The European Mania in Bipolar Longitudinal Evaluation of Medication Study<sup>17</sup> included both inpatients and outpatients in its sample, assessing overall CGI-Bipolar Disorder (CGI-BP), CGI-BP mania, CGI-BP depression, and CGI hallucinations/delusions, the Young Mania Rating Scale (YMRS), the five-item version of the HAM-D, and the functional outcomes of patients with a manic/mixed episode. At the 12-week endpoint, YMRS response rates were 89.1 and 83.2% for the first-episode and multiple-episode groups, respectively.<sup>17</sup> Even though the mentioned studies indicated improvement in all measures evaluated during hospitalization, they did not include broad outcome evaluations such as QoL, symptoms, and functional status. Moreover, those studies did not use SMI criteria for the selection of their sample, which probably resulted in a sample with less severe cases.

Although widely used, few data are currently available on the characteristics and on the effect of treatment of acute inpatients in tertiary general hospitals in low- and middle-income countries. There are also scientific and clinical gaps between the results of randomized controlled trials and the care actually received by psychiatric patients.<sup>15</sup> Anyway, quality monitoring is a feasible recommendation even in settings with limited resources.<sup>8</sup>

The objective of this study was to evaluate and describe the general response of SMI patients to treatment during acute psychiatric hospitalization in a low- and middle-income country (Brazil) in terms of symptoms, functionality, and QoL. The secondary objectives were to evaluate clinical and sociodemographic predictors of clinical remission and to describe the characteristics of the sample and of inpatient treatment.

## Methods

This study was developed in the tertiary psychiatric care unit of Hospital de Clínicas de Porto Alegre (HCPA), a teaching hospital affiliated with Universidade Federal do Rio Grande do Sul (UFRGS), Porto Alegre, Brazil. The inpatients received individualized treatment in an interdisciplinary setting, including psychopharmacological management, electroconvulsive therapy (ECT), and psychotherapeutic interventions involving individual and/or family therapy, occupational therapy, aerobic exercise, and nursing care. A naturalistic study design, in which the research team did not interfere with the choice or provision of treatment, was used. All patients aged 18 years or older and admitted between June 2011 and December 2013 were invited to participate. Patients were included if they met two of the SMI criteria: GAF  $\leq$  50 (in the initial evaluation) and duration of previous service contact  $\geq$  2 years.<sup>2,3</sup> The following exclusion criteria were used: insufficient communication skills to participate in the interview or to provide a written informed consent, primary diagnosis of drug or alcohol dependence (the inpatient unit does not treat patients with drug or alcohol dependence), and hospitalization for less than 7 days (due to limitations of the research team). The study was conducted in compliance with the Declaration of Helsinki and was approved by the local ethics committee (protocol GPPG-HCPA 100265).

Upon admission to the inpatient unit, consecutive patients were screened for eligibility. Within 72 hours of hospitalization, clinical evaluations by the Mini-International Neuropsychiatric Interview (MINI)<sup>18</sup> and by the Cumulative Illness Rating Scale (CIRS)<sup>19</sup> to evaluate comorbidities, in addition to sociodemographic assessments, were performed by trained psychiatrists and psychiatry residents. Self-rated measures were used to study a range of clinical, social, and functional outcomes associated with treatment throughout the observation period. The following parameters were also assessed at admission and within 72 hours of discharge: CGI,<sup>20</sup> a clinician-rated seven-point scale that measures disease severity; the Brief Psychiatric Rating Scale (BPRS),<sup>21</sup> to measure psychiatric symptoms such as depression, anxiety, hallucinations, and unusual behavior; GAF,<sup>22</sup> to measure symptomatology and functioning; the World Health Organization Quality of Life Instrument – Abbreviated version (WHOQOL-Bref),<sup>23</sup> the 26-item WHO instrument, to measure QoL related to health and health care; HAM-D,<sup>24</sup> a 17-item scale that measures depressive symptomatology; YMRS,<sup>25</sup> an 11-item multiple-choice questionnaire that assesses the severity of mania; and HAM-A,<sup>26</sup> to measure the severity of anxiety symptoms. The latter three assessments were only performed if the patient presented with depressive episodes, manic episode, and generalized anxiety disorder, according to the MINI.

SPSS version 18.0 was used for the statistical analyses. A significance level of  $p < 0.05$  was used for all comparisons. Demographic and clinical data were described, and treatment outcome variables were compared using a Student's *t* test for independent and paired samples (parametric data). The scores obtained at admission were compared to the scores at discharge in the total sample and among the different listed diagnostic subgroups. A logistic regression analysis was

applied to evaluate the effects of potential predictor and confounding variables on response at discharge. Gender, age, partnership status (single, widowed, or divorced), occupational status (unemployed or invalidity allowance), CGI scores at admission, age at disease onset, number of previous hospitalizations, comorbidity with anxiety, diagnosis of depressive episode, manic episode, or schizophrenia, length of stay (LOS), and treatment (antidepressant, mood stabilizer, antipsychotics other than clozapine, clozapine, or ECT) were assessed. Variables with a  $p$  value  $\leq 0.2$  in the univariate analysis were included in the regression analysis. CGI scores  $\leq 2$  at discharge were defined as a remission criterion.<sup>27</sup>

## Results

### Sample characteristics

A total of 239 SMI patients were included in the study (Figure 1). The baseline characteristics of the sampled patients are listed in Table 1. Almost 65% of the patients had attempted suicide at least once and almost 76% had been previously referred for psychiatric hospitalization. During our study, there were eight non-fatal suicide attempts and one successful suicide. Mean LOS was  $28.95 \pm 19.86$  days. According to the MINI, the most frequent diagnoses

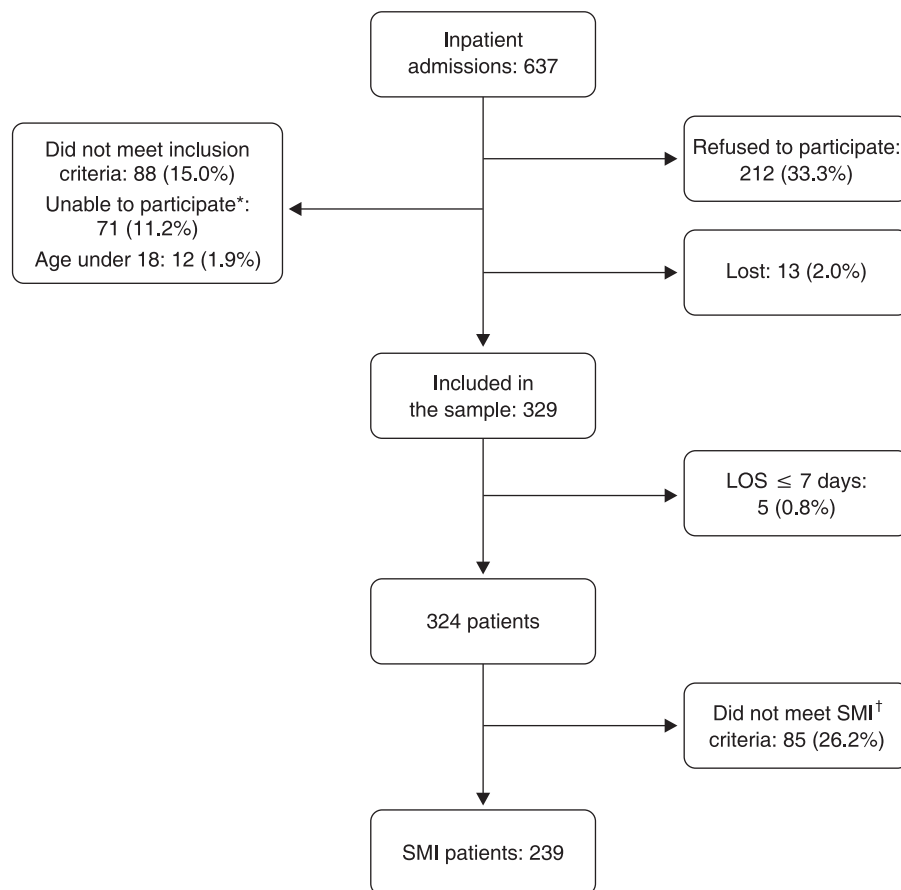
were depressive episodes (63.2%), followed by psychosis (20.9%), which includes schizophrenia and related disorders, and manic episodes (15.9%); there was high comorbidity with anxiety disorders (65.5%). The treatments and their frequencies are listed in Table 2.

The CIRS revealed that the frequency of at least one comorbid disorder (other than psychiatric) was 74.5%. The mean CIRS score (excluding psychiatric conditions) was  $2.35 \pm 2.49$ , and the most frequent comorbid disorders were hypertension (17.9%), diabetes (12.1%), hypothyroidism (8.1%), rhinitis (3.1%), epilepsy (3.5%), and human immunodeficiency virus (HIV) infection/acquired immunodeficiency syndrome (AIDS) (2.6%).

### Symptomatic, functional, and QoL outcomes

#### BPRS, CGI, and GAF

BPRS scores significantly improved during hospitalization, yielding means of  $25.54 \pm 11.37$  at admission and  $10.96 \pm 8.11$  at discharge ( $p < 0.001$ ). An overall CGI mean score of  $4.87 \pm 1.17$  at baseline indicated moderate illness severity. These mean scores improved to  $3.7 \pm 1.32$  at discharge ( $p < 0.001$ ), indicating mild severity. Patients also experienced significant mean improvements in functionality (GAF) from baseline to endpoint. GAF mean levels were  $33.26 \pm 13.75$



**Figure 1** SMI patients included in the study. LOS = length of stay; SMI = severe mental illness. \* Clinical and psychiatric conditions that prevented informed consent from being obtained. † Excluded *a posteriori* due to limitations of the research team.

**Table 1** Sociodemographic and clinical characteristics of sampled patients

Variable	n=239
Gender (female)	133 (55.9)
Age (years)	46.42±14.59
Race (white)	123 (87.9)
Weight (kg)	75.55±18.28
Grade repetition	96 (44.7)
Education (years)	9.21±4.65
Employment status	
Employed	62 (27.2)
Unemployed	46 (20.2)
Homemaker	10 (4.4)
Student	4 (1.8)
Retired	34 (14.9)
Invalidity allowance	72 (31.5)
Partnership status	
Single	85 (37.1)
Married/living with a partner	87 (38)
Separated	41 (17.9)
Widowed	16 (7.0)
Economic status*	
A	17 (12.2)
B	51 (36.7)
C	53 (38.1)
D-E	18 (12.9)
GAF (admission)	33.26±13.75
Duration of the disorder <sup>†</sup> (years)	15.11±11.87
Previous suicide attempt	141 (64.7)
Previous psychiatric hospitalization	180 (75.9)
Number of previous hospitalizations	4.11±5.50
Length of hospitalization (days)	28.31±15.59
Smoking status (current smoker)	62 (32.5)

Data presented as n (%) or mean ± standard deviation.

GAF = Global Assessment of Functioning.

\*Brazilian Economic Classification Criteria ("Criterion Brazil")

mean monthly household income in U.S. dollars (A: 5,358;

B: 2,915-1,513; C: 905-620; D-E: 434).

<sup>†</sup>Duration of the disorder = time elapsed since the first medical diagnosis.

at admission and 64.41±13.80 at discharge ( $p < 0.001$ ). The results of these variables for each diagnostic subgroup are shown in Table 3.

#### WHOQOL-Bref

The WHOQOL-Bref was assessed in 171 patients upon admission and at discharge. All QoL domains improved significantly when the total patient sample and the depressive episode subgroup were considered. However, in the manic episode subgroup, only the psychological and social domains showed significant improvement, as also did the psychological and physical health domains in the psychosis subgroup (Table 4).

#### Specific symptomatic scales

##### HAM-D

Among patients with depression, the mean HAM-D scores improved from 23.40±6.88 at admission to 7.06±4.74 ( $p < 0.001$ ) at discharge. At discharge, the response rate ( $\geq 50\%$

decrease from the baseline total HAM-D score) was 82% and the remission rate ( $\text{HAM-D} \leq 7$ ) was 52%.

##### YMRS

In patients with manic/mixed episodes, the mean YMRS scores were 23.71±9.88 at admission and 4.62±3.70 at discharge ( $p < 0.001$ ). The response rate ( $\geq 50\%$  decrease from the baseline total YMRS score) was 84% and the remission rate ( $\text{YMRS} \leq 7$ ) was 81%.

##### HAM-A

Patients diagnosed with generalized anxiety disorder by MINI were further assessed using the HAM-A. A total of 67 patients were assessed; the mean scores were 30.28±9.85 at admission and 10.55±8.91 at discharge. A total HAM-A score response ( $\geq 50\%$  reduction in total HAM-A score) was verified in 80% of the patients whereas remission ( $\text{HAM-A} \leq 7$ ) was verified in 48% of the patients.

#### Remission (CGI)

In the analyzed sample, 47 (15.6%) patients achieved remission during their hospital stay ( $\text{CGI} \leq 2$  upon discharge). After the univariate analysis, diagnosis (depressive episode, manic episode or schizophrenia) was included in the regression model as a possible predictor of remission, adjusted by CGI scores at admission. The estimates of the effects of the predictor variables calculated from the regression are summarized in Table 5. There was no evidence of multicollinearity. Patients with manic episodes (odds ratio = 4.03; 95% confidence interval [95%CI] 1.14-14.30;  $p = 0.03$ ) were more likely to achieve remission in CGI scores when compared with patients with depressive episodes.

## Discussion

Overall, the present study demonstrated that the intensity of SMI symptoms markedly decreased and that patients improved their function and QoL during the hospital stay. Moreover, patients with manic episodes, when compared with those with depressive episodes, were more likely to achieve CGI remission. To our knowledge, few studies performed in a general hospital setting in Brazil have assessed improvement of symptoms, functions, and QoL among acute SMI patients during hospitalization.

Despite debates on and policies against the use of inpatient therapy, this type of treatment modality in general hospitals, in addition to non-hospital integrated community care, is still a strong necessity.<sup>8</sup> In Brazil, public mental health care focuses on CAPS, which should be the main referral centers for severe cases, thus avoiding ward admissions (psychiatric hospitals or psychiatric wards in general hospitals) whenever possible.<sup>11</sup> SMI patients usually require different levels of care depending on the intensity of symptoms, and available evidence supports the combination of community services and modern hospital care.<sup>28</sup> However, there has been a shortage of psychiatric beds in general hospitals in Brazil in recent years.<sup>11</sup>

**Table 2** Pharmacological and non-pharmacological treatment profiles according to diagnosis (MINI)

	Psychosis* (n=50)	Depressive episode (n=151)	Manic and mixed episode (n=38)
ECT	12 (24.0)	51 (33.8)	12 (31.6)
Psychotherapy	6 (12.0)	55 (36.4)	12 (31.6)
Antipsychotics			
Typical	7 (14.0)	14 (9.3)	6 (15.8)
Atypical	13 (26.0)	70 (46.4)	15 (39.5)
Clozapine	20 (40.0)	10 (6.6)	9 (23.7)
Mood stabilizers			
Anticonvulsants	16 (32.0)	23 (15.2)	15 (39.5)
Lithium	-	12 (7.9)	15 (39.5)
Antidepressants			
SSRIs	5 (10.0)	61 (40.4)	4 (10.5)
SNRIs	-	8 (5.3)	-
TCAs	2 (4.0)	9 (6.0)	-
Other	-	17 (11.3)	-
Benzodiazepines	13 (26.0)	29 (19.2)	7 (18.4)

Data presented as n (%).

ECT = electroconvulsive therapy; MINI = Mini-International Neuropsychiatric Interview; SNRIs = serotonin and norepinephrine reuptake inhibitors; SSRIs = selective serotonin reuptake inhibitors; TCAs = tricyclic antidepressants.

\* Schizophrenia and other psychotic disorders.

Many of the positive outcomes shown in the present study may result from the use of multiple strategies during inpatient treatment: optimized pharmacological treatment combined with a multidisciplinary approach, including psychotherapy and sociotherapeutic strategies. Differently from what we initially thought, the use of clozapine and

ECT was not a good predictor of clinical remission. ECT was used in approximately 30% of patients with mood disorders (unipolar and bipolar depression) while clozapine was given to 40% of psychotic patients. Thus, it is essential that we not underestimate the benefits of intensive care for acute episodes, which includes recreational therapy and

**Table 3** Main diagnosis (MINI) at baseline and the respective clinical measures at admission and at discharge

	Depressive episode (n=117)			Manic/mixed episode (n=19)			Psychosis* (n=33)		
	Admission	Discharge	p-value <sup>†</sup>	Admission	Discharge	p-value	Admission	Discharge	p-value
BPRS	22.39±8.85	8.51±5.89	< 0.001	29.48±11.69	12.74±7.68	< 0.001	32.33±14.30	17.30±10.91	< 0.001
CGI	4.31±0.92	3.43±1.15	< 0.001	5.96±0.84	3.84±1.65	< 0.001	5.79±0.96	4.45±1.27	< 0.001
GAF	33.26±13.75	64.41±13.80	< 0.001	28.14±11.70	53.90±18.43	< 0.001	26.11±10.81	47.71±19.08	< 0.001
HAM-D	24.14±6.98	7.83±5.32	< 0.001	22.81±5.52	8.38±6.38	< 0.001	-	-	-
YMRS	-	-	-	22.74±10.28	4.16±4.07	< 0.001	-	-	-
HAM-A	30.27±9.99	10.89±8.54	< 0.001	30.75±10.71	10.00±13.11	0.005	-	-	-

Data presented as mean ± standard deviation.

BPRS = Brief Psychiatric Rating Scale; CGI = Clinical Global Impression Scale; GAF = Global Assessment of Functioning; HAM-A = Hamilton Anxiety Rating Scale; HAM-D = Hamilton Depression Rating Scale; MINI = Mini-International Neuropsychiatric Interview; YMRS = Young Mania Rating Scale.

\* Schizophrenia and other psychotic disorders.

<sup>†</sup> Student's *t* test; all p-values were statistically significant.

**Table 4** WHOQOL-Bref assessments at admission and at discharge in the main diagnostic subgroups

WHOQOL-Bref domains	Depressive episode (n=117)			Manic/mixed episode (n=23)			Psychosis* (n=33)		
	Admission	Discharge	p-value <sup>†</sup>	Admission	Discharge	p-value	Admission	Discharge	p-value
Physical health	42.97±14.44	53.58±13.25	< 0.001	54.19±24.24	58.85±13.66	0.21	50.29±21.28	59.31±15.50	0.01
Psychological	38.53±15.31	51.26±16.75	< 0.001	48.44±24.17	61.28±20.28	0.001	54.86±20.99	62.08±17.45	0.01
Social relationships	42.84±23.52	56.21±23.97	< 0.001	46.01±26.58	57.97±20.18	0.03	49.35±29.90	59.11±24.54	0.06
Environmental	48.90±17.95	58.72±15.94	< 0.001	49.24±21.12	56.77±14.75	0.11	54.30±19.41	58.25±13.34	0.18

Data presented as mean ± standard deviation.

WHOQOL-Bref = World Health Organization Quality of Life Instrument - Abbreviated version.

\* Schizophrenia and other psychotic disorders.

<sup>†</sup> Student's *t* test.

**Table 5** Logistic regression for prediction of remission\* (CGI  $\leq$  2 upon discharge) during inpatient treatment (n=163)

Independent variables <sup>†</sup>	B	SE	OR	95%CI for OR		p-value
				Lower	Upper	
Diagnosis, depressive episode	-	-	1.00	-	-	-
Diagnosis, schizophrenia	-0.40	0.81	0.66	0.13	3.32	0.62
Diagnosis, manic episode	1.01	0.64	4.03	1.14	14.30	0.03 <sup>‡</sup>
Constant	0.99	0.93	2.70	-	-	0.29

Adjusted for Clinical Global Impression Scale (CGI) scores at admission.  $R^2 = 0.049$  (Hosmer & Lemeshow); 0.072 (Cox & Snell); 0.125 (Nagelkerke).  $\chi^2$  of the model: 12.16,  $p = 0.007$ .

95%CI = 95% confidence interval; OR = odds ratio; SE = standard error.

\* Remission (CGI  $\leq$  2 upon discharge) is the dependent variable, coded as 0 = no; 1 = yes (reference category).

<sup>†</sup> Diagnosis: 0 = depressive episode (reference category); 1 = schizophrenia; 2 = manic episode.

<sup>‡</sup>  $p < 0.05$ .

implementation of appropriate physical exercise, sleep, and meal-time routines.

QoL assessment results in this study are consistent with those of previous investigations, which showed that symptom relief in several psychiatric disorders was associated with significant improvements in QoL. By contrast, Rubio et al.<sup>29</sup> showed that although the remission of several psychiatric disorders correlated with significant improvement, remission was generally not associated with full restoration of health-related QoL, even among those without comorbidities. Consequently, additional investigation is necessary to compare restoration of QoL with the treatment received by psychiatric inpatients and by the general population. Evidence suggests that QoL can be regarded as an independent outcome criterion unrelated to schizophrenia and bipolar disorder (especially mania) symptoms given that the extent of association is too small.<sup>30</sup> It is therefore necessary to confirm the validity of self-assessed instruments in psychotic patients. A literature review of studies on schizophrenic patients concluded that QoL is a valid and useful outcome criterion.<sup>31</sup> Further studies should also estimate the contribution of depressive and anxious symptoms, as well as other variables, to the QoL of schizophrenic and manic patients. Moreover, the results obtained for mood disorders in the present study were similar to those previously reported in the literature. Previous studies on the relationship between QoL and depression have generally shown that QoL deficits in depressed patients are attributable to mood disorders and that their treatment is usually associated with improvements in QoL.<sup>32</sup> Further studies are necessary for a more in-depth investigation of the contribution of clinical and sociodemographic variables to QoL in this population.

In our study, only one patient committed suicide, while eight had unsuccessful suicide attempts during their stay. Since this is a strictly supervised unit with highly well-trained personnel, those events should be considered indicators of the severity of mental disorders among inpatients.

Even though hospitalization was a little longer in the present study, our mean length of stay is clinically comparable to studies that apparently provided similar inpatient treatment in Brazil. Mean LOS in previous studies were  $27.1 \pm 15.0$  days<sup>33</sup> and  $20.3 \pm 16.6$  days.<sup>13</sup> Also, mean LOS according to data on Brazilian public inpatient treatment was 14 days for psychiatric wards in general hospitals,<sup>11</sup> compared to a median LOS of 15 days (95%CI 14-15) among manic inpatients treated in private facilities.<sup>34</sup> Moreover, in other countries, Masters et al.<sup>35</sup> had a mean LOS of  $19.3 \pm 21.2$

days and Thompson et al.<sup>36</sup> reported a mean hospital stay of  $35.4 \pm 51.9$  days. However, longer LOS is reported in the literature. Seemüller et al.<sup>15</sup> reported a mean inpatient treatment duration of  $53.6 \pm 47.5$  days while the MARS project had an average hospitalization time of  $82.6 \pm 60.2$  days.<sup>16</sup> We believe the prevalence of severe and resistant disorders contributed to the results observed in the present study.

Our results also confirm a high incidence of other clinical comorbidities in psychiatric patients. For example, the prevalence of HIV/AIDS was 10 times higher than in the general Brazilian population.<sup>37</sup> Conversely, the prevalence of hypertension was almost the same as in the general population.<sup>38</sup> The present results might indicate these chronic disorders are underdiagnosed, even in our tertiary care center.

Some limitations of our study should be acknowledged. First, since it is a naturalistic study of patients with acute episodes, our results might indicate a "return-to-the-mean" effect. However, the mental severity of our patient sample argues against this hypothesis. Second, we could not assure that patients who refused to participate had exactly the same profile as those who agreed to their inclusion in this study. Third, the naturalistic study design is associated with many treatment-related variables that could not be controlled for. On the other hand, this allows us to ensure that the treatment provided in our study is "true-to-life." Lastly, our data show the acute results of an acute intervention. We did not evaluate if the improvements observed are stable over time, nor what should be done in terms of maintenance therapy.

SMI patients showed significant improvement of symptoms, function, and QoL during their stay in a general tertiary hospital. It is not possible to conclude whether the observed outcomes are related to inpatient treatment. However, psychiatric hospitalization allowed for a more intensive treatment and for the use of multiple strategies. Our data suggest that psychiatric inpatients can have marked acute improvements during relatively short interventions (of approximately one month).

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## Disclosure

The authors report no conflicts of interest.

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