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Resilience in severe mental disorders: correlations to clinical measures and quality of life in hospitalized patients with major depression, bipolar disorder, and schizophrenia

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Abstract

Purpose To evaluate resilience in severe mental disorders and correlate it with clinical measures and quality of life.

Methods Resilience (Resilience Scale, RS) and quality of life (WHOQOL-BREF questionnaire) were prospectively evaluated in a sample of 384 hospitalized patients diagnosed with severe mental disorders (depression, bipolar disorder and schizophrenia). Clinical outcomes were measured using the Global Assessment of Functioning Scale (GAF), Clinical Global Impression (CGI), Cumulative Illness Rating Scale (CIRS), Hamilton Scale-Depression (HAM-D), Young Mania Rating Scale (YMRS), and Brief Psychiatric Rating Scale (BPRS).

Results Resilience measure showed a difference between the three clinical groups analyzed in the study, with lower scores in depressed patients than in bipolar disorder or schizophrenia patients. There was a trend toward a correlation between resilience and depressive symptoms (Hamilton Scale-Depression; $P=0.052$; $r_s=-0.163$). The scores in the resilience scale's personal competence domain presented a tendency of association with general psychiatric symptoms (Brief Psychiatric Rating Scale; $P=0.058$; $r=-0.138$). There was a significantly positive association between resilience and all domains of quality of life ($r=0.306$–0.545; $P<0.05$). Sociodemographic data like age, education, intelligence quotient, sex, and marital status were associated with resilience.

Conclusion Depressive patients had low scores on the resilience scale compared to patients with other disorders. Resilience was positively associated with quality of life. Therefore, it deserves special attention, as it promotes more positive outcomes and improves patients' quality of life with severe mental disorders.

Keywords Resilience · Severe mental disorder · Quality of life · Major depression · Bipolar disorder · Schizophrenia

Introduction

Recent studies have given new meaning to the concept of resilience through psychological and biological research of the construct. Psychological resilience can be defined as the capacity to adapt to adverse environmental circumstances and can be determined by individual characteristics, family cohesion, and external support [1–3]. Mental health studies have defined resilience as the ability to cope with stress [4–7] and identify resilience as a key protective factor against depression and other mental disorders [8]. Frequent exposure to adverse life events is an important risk factor for developing psychopathology [9]. Resilient individuals have responses and perceptions that are more adaptive to stressful situations than vulnerable individuals with poor adaptive responses and more threatening perceptions [10]. The development of psychopathology, particularly severe

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mental disorders characterized by longer duration of illness (> 2 years), emotional suffering, and functional impairment, has an important relationship with genetic predisposition, further episodes, and outbreaks associated with hypersensitivity to stressful situations [9, 11].

Resilience correlates negatively with depression [12] and suicidal thoughts [13]. Hjendal et al. [8] found that individuals who reported higher scores on the Resilience Scale (RS) were essentially not affected by other psychiatric symptoms when exposed to stressful life events. However, individuals who reported lower levels of resilience developed more psychiatric symptoms when exposed to stressful events. Higher expression of protective resilience factors indicated lower expression of psychological symptoms and, to a certain extent, the absence of psychopathology [4, 8]. Yoshida et al. [14] detected correlations between duration of illness and better quality of life with higher levels of resilience in schizophrenic patients, suggesting that some patients accommodate their illness in a positive way and acquire greater resilience over its course. Mizuno et al. [15] compared resilience in patients with schizophrenia and bipolar disorder with healthy controls and found that patients had lower resilience than the controls. Higher resilience has been associated with lower levels of anxiety, psychological distress, and mixed anxiety/depression [16]. Therefore, based on these studies, resilience can be considered as a predictor of psychiatric symptoms [17], which may also be a protective outcome. Individuals who experience adversity in life could be more resistant to the development of mental disorders [18].

Research on resilience and health commonly focus on responses to communal threats [12], diagnosis of cancer [19], chronic pain [20], serving in the military [21, 22], and in HIV/AIDS patients [23]. In the context of mental disorders, psychological resilience is associated with lower risk of onset or relapse, decreased severity of the disorder, or increased speed of recovery [24]. Resilience intervention studies have been shown to increase people's ability to handle stressors and increase adaptability to stress, but the impacts of resilience intervention on clinical outcomes in severe mental disorders have not yet been demonstrated [5]. Moreover, the resilience process in adults, especially in individuals with severe mental disorders, who are chronically exposed to stress, has not yet been properly addressed in the literature. Recent studies on psychopathology have focused on positive adaptations in response to stress, and recent psychiatry research has focused on personal skills and protective factors [25].

To date, no previous studies have correlated resilience with clinical measures and quality of life, comparing it among individuals diagnosed with severe mental disorders, such as major depression, bipolar disorder, or schizophrenia. The present study evaluated resilience in patients with severe mental disorders (major depression, bipolar disorder, and schizophrenia) and correlated it with clinical measures and quality of life. Then, resilience was compared among patients diagnosed with these severe mental disorders. Inpatients with higher scores of resilience were hypothesized to have more favorable clinical outcomes and higher quality of life scores.

Subjects and methods

Study design and patients

The present study was part of a larger prospective cohort study whose objective was to evaluate and follow up patients with severe mental illnesses who were admitted to a Brazilian psychiatric unit between May 2011 and April 2013. Diagnostic factors, prognosis, and treatment were evaluated, as well as their association with biological markers. The study evaluated psychiatric inpatients in the Hospital de Clínicas de Porto Alegre, a tertiary care general hospital in Southern Brazil. Assessments were performed 48 h prior to discharge, so the patients were clinically stable. Informed consent was obtained from all participants to meet ethical requirements, and the project was approved by the Ethical and Scientific Committee [10-0265] [26]. Patients with cognitive impairment, substance use disorder as a primary diagnosis, or who were catatonic were excluded. Trained psychiatrists or psychiatry residents evaluated the main diagnosis of each patient using the Mini International Neuropsychiatric Interview in a semi-structured interview performed within the first 72 h after admission.

Questionnaires

Trained interviewers (medicine or psychology students and psychologists) evaluated sociodemographic data, quality of life, and the Brazilian version of the RS [27]. Sociodemographic information was structured in a protocol completed with the best information available (patient interview or medical records) within the first 72 h after admission, including age, sex, ethnicity, marital status, occupation, education, socioeconomic level, psychiatric hospitalizations, any suicide attempt(s), and duration of illness. Trained psychologists used the Brazilian adapted version of the Wechsler Adult Intelligence Scale to estimate intelligence quotient [IQ] [28]. The resilience measure was evaluated 48 h prior to patient discharge.

Clinical measures were used at admission and before discharge, but only data related to hospital discharge was used in the present study. Clinical measures included: the *Global Assessment of Functioning Scale [GAF]*—is described in Diagnostic and Statistical Manual of Mental

Disorders—axis V. It is a scale widely used to track the patients clinical progress, using a single measure, which can vary from 0 to 100, and higher scores indicate higher levels of functioning [29]; *Clinical Global Impression [CGI]*—It is a severity symptom, response and effectiveness of treatment for mental disorders patients measure. It is a short scale, with 3 items, wich assesses: severity disease, global improvement and effectiveness index [30]; *Young Mania Rating Scale [YMRS]*—It was developed to measure the presence and severity of mania and other associated symptoms. The score ranges from 0 (absence of symptom) to 4 (presence of the symptom in its most severe form). The total sample obtained a Cronbach's alpha of 0.715 [31], *Hamilton Depression Rating Scale [HAM-D]*—This scale serves to identify the severity of depressive symptoms. It was used the 17-items scale, and scores vary from: 7–17 points = mild depression, 18–24 = moderate depression and scores above 25 points = severe depression. The total sample obtained Cronbach's alpha 0.695 [32], *Brief Psychiatric Rating Scale [BPRS]*—It is the most used instrument to assess symptomatic changes in psychiatric patients. The version has 18-items referring to various aspects of the patient's symptoms, with 5 responde options in each item, related to the severity of the symptom: 0 = absent, 1 = mild or with doubtful presence, 2 = present in a mild degree, 3 = present in moderate degree and 4 = present in severe or extreme degree. The score is obtained through the sum of all items, and the result can vary from 0 to 72 points. Higher the score, greater the presence and the severity of symptoms. The total sample obtained a Cronbach's alpha 0.999 [33], and *Cumulative Illness Rating Scale [CIRS]*—This scale is used to indicate the health status of adults. Clinicins rate the pathology and impairment of major organ systems and also psychological, metabolic, neurological and musculoskeletal aspects of the individual. Each system is weighted from 0 to 4 points [34]. Even though the BPRS measures psychotic symptoms, it was used on all patients regardless of the presence of a psychotic disorder. The BPRS is a useful tool for quantifying general psychopathology across disorders and can be used easily in research and clinical settings [35].

Resilience was assessed using the Brazilian Portuguese version of the *Resilience Scale [RS]* [27, 36]. This tool is a 25-item, 7-point Likert-type scale. The first domain is Personal Competence and represents self-reliance, independence, determination, invincibility, mastery, resourcefulness, and perseverance. The second domain is Acceptance of Life and Self and reflects adaptability, flexibility, and a sense of peace despite adversity, as well as a balanced perspective of life and acceptance of life circumstances. Higher scores on the RS indicate greater resilience. The total sample obtained a Cronbach's α resilience score of 0.93; patients with major depression scored 0.93, patients with bipolar disorder scored 0.94, and schizophrenic patients scored 0.91. These α scores for resilience indicate the reliability of the scale for this sample.

Quality of life is defined by "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns" [37]. Quality of life was evaluated using the *World Health Organization's Quality of Life abbreviated instrument [WHOQOL-BREF]* [38]. This instrument consists of 26 items and a Likert scale and is composed of physical, psychological, social, and environmental domains [39]. The total sample obtained a Cronbach's alpha quality of life score of 0.745.

Statistical analysis

Data were presented as means ± standard deviations or percentages unless specified otherwise. Analyses were performed using SPSS software version 21.0. The normality of the variables was evaluated by the Shapiro-Wilks test. Significance levels were set at 0.05 for primary outcomes and 0.20 for inclusion of variables in the multivariate regression model. Groups of patients with major depression, bipolar disorder, and schizophrenia were compared for sociodemographic data, clinical measures, quality of life, and resilience. To compare means between groups, analysis of variance with Tukey test were applied. Variables considered asymmetric were resolved by Kruskal–Wallis and Mann–Whitney tests.

The relationship between resilience and clinical measures and quality of life were investigated using bivariate Pearson's correlation analysis. A linear multivariate regression model with extraction by backward method was performed to investigate the association between resilience and clinical measures and variables, adjusted for suicide attempt(s), length of hospitalization, IQ (Inteligence Quotient), number of previous psychiatric hospitalizations, gender, age, education level, marital status, severe mental disorder (major depression, bipolar disorder, schizophrenia), psychiatric symptoms (BPRS), clinical global impression (CGI), functioning (GAF), and clinical comorbidities (CIRS) scores. A $P < 0.05$ was considered statistically significant. Multiple correlation tests were corrected by the Bonferroni test.

Results

Sociodemographic and clinical characteristics and measures in patients with severe mental disorders

Main sociodemographic characteristics and clinical measures are presented in Table 1. Comparison of patients diagnosed with major depression, bipolar disorder, and

Table 1 Socio-demographic and clinical characteristics and measures in severe mental disorder in patients (major depression, bipolar disorder, schizophrenia)

Characteristics	Severe mental disorder ($n=384$)	Major depression ($n=200$)	Bipolar disorder ($n=71$)	Schizophrenia ($n=113$)	*P* value
Age	43.4 ± 15.1	45.7 ± 15.2[b]	43.5 ± 16.1[ab]	39.4 ± 13.6[a]	0.002
Education (years)	9.2 ± 4.6	9.4 ± 4.4[ab]	10.2 ± 4.6[b]	8.2 ± 4.8[a]	0.044
Sex (female)	213 (55.5)	130 (65.0)*	48 (67.6)*	35 (31.0)	< 0.001
Ethnicity (White)	288 (82.1)	150 (82.4)	51 (79.7)	87 (82.9)	0.858
Marital status					< 0.001
Single	147 (41.5)	50 (26.9)	31 (48.4)	66 (63.5)*	
Married	111 (31.4)	85 (45.7)*	13 (20.3)	13 (12.5)	
Separated	73 (20.6)	37 (19.9)	14 (21.9)	22 (21.2)	
Widowed	23 (6.5)	14 (7.5)	6 (9.4)	3 (2.9)	
Occupation					< 0.001
Student	14 (4.0)	6 (3.3)	2 (3.1)	6 (5.8)	
Employed	92 (26.4)	63 (34.6)*	13 (20.3)	16 (15.5)	
Unemployed	74 (21.2)	26 (14.3)	10 (15.6)	38 (36.9)*	
Stay at home	15 (4.3)	8 (4.4)	2 (3.1)	5 (4.9)	
Receiving benefits	61 (17.5)	36 (19.8)	14 (21.9)	11 (10.7)	
Retired for years of service	42 (12.0)	18 (9.9)	11 (17.2)	13 (12.6)	
Disability retiree	51 (14.6)	25 (13.7)	12 (18.8)	14 (13.6)	
Socio economic class					0.658
A	25 (7.6)	18 (10.1)	3 (5.2)	4 (4.4)	
B	132 (40.2)	70 (39.1)	23 (39.7)	39 (42.9)	
C	127 (38.7)	69 (38.5)	22 (37.9)	36 (39.6)	
D–E	44 (13.4)	22 (12.3)	10 (17.2)	12 (13.2)	
Estimated IQ**	83.2 ± 15.3	85.9 ± 13.1[ab]	86.7 ± 12.3[b]	77.5 ± 18.1[a]	0.015
CGI***	3.51 ± 1.32	3.15 ± 1.13[a]	3.31 ± 1.36[a]	4.32 ± 1.31[b]	< 0.001
BPRS****	10.5 ± 8.1	8.7 ± 6.0[a]	8.7 ± 7.2[a]	14.9 ± 10.3[b]	< 0.001
GAF*****	58.9 ± 18.2	64.3 ± 15.9[b]	62.5 ± 15.6[b]	47.2 ± 18.3[a]	< 0.001
CIRS (general)******	1 (0–3)	2 (0–4)[b]	1 (0–3)[a]	0 (0–2)[a]	< 0.001
CIRS (number of categories)******	1 (0–2)	2 (0–2)[b]	1 (0–2)[a]	0.5 (0–1)[a]	< 0.001
Age at first diagnosis (years)	30.6 ± 13.4	35.5 ± 13.2[b]	27.4 ± 12.4[a]	24.3 ± 11.0[a]	< 0.001
Duration of illness (years)	8 (2–20)	4.5 (1.0–15.3)[a]	11 (3–21)[b]	11.5 (6.8–23)[b]	< 0.001
Any suicide attempt	194 (53.4)	130 (68.4)*	29 (44.6)	35 (32.4)	< 0.001
Psychiatric hospitalization	2 (1–5)	1 (0–3)[a]	3 (1–7.5)[b]	4 (2–9)[b]	< 0.001
Length of inpatient treatment (days)	26 (17–38)	24 (15.3–34)[a]	24 (18–32)[a]	31 (21–53)[b]	< 0.001

Values are shown as mean ± standard derivation, median (percentiles 25–75) or % (*n*)

[a,b]Equal letters don't differ by Tukey Test or Mann–Whitney to 5% significant

*Statistically significant association for the testing of waste adjusted to 5% significance

**Adult intelligence scale (WAIS-III) Brazilian Version

***Clinical Global Impression

****Brief Psychiatric Rating Scale

*****Global Assessment Functioning

******Cumulative Illness Rating Scale

schizophrenia showed statistically significant differences in age, gender, education level, marital status, and occupation. Patients with major depression were older (45.7 ± 15.2 years; $P = 0.002$), had an employment rate of 34.6% ($P < 0.001$), 45.7% were married ($P < 0.001$), and 65% were women ($P < 0.001$). Patients with bipolar disorder had completed more years of education than the others (10.2 ± 4.6 years; $P = 0.044$), and 67.6% were women ($P < 0.001$). The schizophrenic patients were the youngest (39.4 ± 13.6), had completed 8.2 ± 4.8 years of education ($P = 0.002$), and 63.5% were single ($P < 0.001$).

Clinical characteristics and measures varied significantly among the different severe mental disorders ($P < 0.001$). The estimated IQ classifications in patients with major depression (85.9 ± 13.1; $P = 0.015$) and bipolar disorder (86.7 ± 12.3; $P = 0.015$) were low average intelligence level, and schizophrenic patients (77.5 ± 18.1; $P = 0.015$) showed borderline intelligence level. Compared to patients with major depression and bipolar disorder, schizophrenic patients had higher scores in clinical global impression (CGI) (4.32 ± 1.31; $P < 0.001$) and global functioning (GAF) (47.2 ± 18.3; $P < 0.001$), more psychiatric symptoms (BPRS, 14.9 ± 10.3; $P < 0.001$), and longer treatment (31 ± 21–53 years; $P < 0.001$). Compared to patients with bipolar disorder and schizophrenia, depressive patients had more clinical comorbidities (CIRS; median, 2 points; range, 0–4 points; $P < 0.001$). Most patients with major depression (68.4%, $P < 0.001$) had attempted suicide.

Correlation between resilience and clinical measures

Resilience was significantly negatively correlated with depressive symptoms (Hamilton Depression Rating Scale score), the Acceptance of Life and Self domain ($r = -0.185$; $P = 0.027$), and there is a tendency for an association between depressive symptoms and total score of the resilience scale ($r = -0.163$; $P = 0.052$). General Psychiatric symptoms (BPRS score) tended to correlate with the Personal Competence domain of resilience ($r = -0.138$) with marginal levels of significance ($P = 0.058$). The other clinical outcomes did not have a significant correlation with resilience (Table 2).

Multivariate linear regression was performed using resilience as an outcome and sociodemographic and clinical characteristics and measures as predictors. Each regression was performed with the diagnoses of major depression, bipolar disorder, and schizophrenia separately, and the following variables were selected for adjustment depending on their statistical significance ($P < 0.20$): IQ, gender, age, education level, marital status, and general psychiatric symptoms (BPRS score). In bipolar disorder, resilience is positively associated with the female gender ($\beta = 0.561$; $P = 0.031$), young age ($\beta = -0.620$; $P = 0.028$), higher IQ ($\beta = 0.983$; $P = 0.012$), and lower educational level ($\beta = -0.599$; $P = 0.026$). In schizophrenia, high levels of resilience were associated with more years of education ($\beta = 1.000$; $P = 0.031$) and being married ($\beta = 0.894$; $P = 0.017$). In major depression, resilience increased with reduction of psychiatric symptoms (BPRS score; $\beta = -0.559$; $P = 0.005$) and a lower IQ ($\beta = -0.416$; $P = 0.028$). Other adjustment factors were not statistically significant in the association (Table 3).

Comparison of resilience levels among patients with severe mental disorders

Comparison of resilience levels among hospitalized patients with severe mental disorders showed differences between

Table 2 Correlation* between resilience and clinical outcomes in severe mental disorder in patients ($n = 384$)

Clinical measures	Resilience Scale		
	Personal competence	Acceptance of life and self	Total
CGI	$r = -0.020$ ($P = 0.793$)	$r = 0.038$ ($P = 0.615$)	$r = -0.002$ ($P = 0.980$)
BPRS	$\mathbf{r = -0.138}$ **($P = 0.058$)**	$r = -0.030$ ($P = 0.677$)	$r = -0.110$ ($P = 0.131$)
GAF	$r = -0.022$ ($P = 0.791$)	$r = -0.100$ ($P = 0.233$)	$r = -0.050$ ($P = 0.550$)
CIRS (general)	$r_s = -0.035$ ($P = 0.619$)	$r_s = -0.083$ ($P = 0.237$)	$r_s = -0.046$ ($P = 0.516$)
CIRS (number of categories)	$r_s = -0.025$ ($P = 0.718$)	$r_s = -0.088$ ($P = 0.209$)	$r_s = -0.041$ ($P = 0.559$)
HAM-D	$r_s = -0.149$ ($P = 0.075$)	$\mathbf{r_s = -0.185}$ **($P = 0.027$)**	$\mathbf{r_s = -0.163}$ **($P = 0.052$)**
YMRS	$r_s = 0.234$ ($P = 0.094$)	$r_s = 0.139$ ($P = 0.327$)	$r_s = 0.201$ ($P = 0.154$)
Psychiatric hospitalization (number)	$r_s = -0.033$ ($P = 0.615$)	$r_s = 0.051$ ($P = 0.432$)	$r_s = -0.007$ ($P = 0.918$)

Bold values represent statistically significant

Clinical Global Impression (CGI); Brief Psychiatric Rating Scale (BPRS); Global Assessment Functioning (GAF); Cumulative Illness Rating Scale (CIRS); Hamilton Depression Rating Scale (HAM-D); Young Mania Rating Scale (YMRS)

*Pearson's correlation

Table 3 Multivariate Linear Regression Model with total resilience adjusted for clinical and socio-demographic variables

Variables	*B** (95% CI)	Standardized coefficient (*β*)**	*P* value
Bipolar disorder (*n* = 71)			
Gender (female)	15.5 (3.46 to 27.6)	0.561	0.031
IQ total	1.13 (0.59 to 1.68	0.983	0.012
Age	−0.57 (−0.98 to −0.15)	−0.620	0.028
Years of education	−2.68 (−4.58 to −0.78)	−0.599	0.026
Schizophrenia (*n* = 113)			
Years of education	4.61 (0.56 to 8.66)	1.000	0.031
Married	52.8 (12.7 to 92.9)	0.894	0.017
Major depression (*n* = 200)			
BPRS	−2.57 (−4.83 to −0.31)	−0.559	0.005
IQ total	−1.33 (−2.20 to −0.46)	−0.416	0.028

All clinical groups (major depression, bipolar disorder and schizophrenia) were adjusted by: IQ, sex, age, education, marital status and psychiatric symptoms (BPRS)

**b* is the linear coefficient that reports the effect on the scores

***β* is the standardized regression coefficient that allows the comparison of the effects between the present variables in the model

those with major depression, (123.8 ± 30.6), bipolar disorder (139.1 ± 24.9), and schizophrenia (130.9 ± 27.3) [$F_{2.257} = 5.07$; $P = 0.007$]. Patients with severe mental disorders defined by the total sample scored 128.3 ± 29.3 on the Resilience Scale, 39.1 ± 9.8 on the Acceptance of Life and Self domain, and 89.1 ± 21.2 on the Personal Competence domain. For the Acceptance of Life and Self domain, depressed patients (37.0 ± 10.2; $P < 0.001$) were statistically different compared to those with bipolar disorder (42.9 ± 8.7; $P < 0.001$) and schizophrenia (41.1 ± 8.5; $P < 0.001$). The Personal Competence domain did not show statistically significant differences.

Correlation of resilience and quality of life among patients with severe mental disorders

There was a significant positive association between all domains of resilience and all domains of quality of life (*r*-values from 0.27 to 0.53; $P < 0.001$). The psychological domain showed the strongest correlation (Personal Competence, $r = 0.509$; Acceptance of Life and Self, $r = 0.530$; total $r = 0.545$; $P < 0.001$; Table 4). After correction for multiple tests, *P*-values remained less than 0.001.

Discussion

The present study explored the association of resilience with clinical measures in hospitalized patients diagnosed with severe mental disorders: major depression, bipolar disorder, and schizophrenia. Comparison of resilience levels among the different disorders (schizophrenia, bipolar disorder, and major depression) showed that patients with major depression had lower levels of resilience compared to those diagnosed with the two other disorders. The importance of an accurate diagnosis of major depression has been well described, mainly due to the high prevalence rate of this condition worldwide and its functional and emotional impact. Although bipolar disorder and schizophrenia are often considered more severe than most other disorders, it is important to note that several studies have found that depressed patients had worse outcomes than patients affected by other

Table 4 Correlation* between quality of life and resilience in severe mental disorders (major depression, bipolar disorder, and schizophrenia) *n* = 384

Quality of life domains	Resilience Scale		
	Personal competence	Acceptance of life and self	Total
Physical	$r = 0.391$ ($P < 0.001$)	$r = 0.402$ ($P < 0.001$)	$r = 0.417$ ($P < 0.001$)
Psychological	$r = 0.509$ ($P < 0.001$)	$r = 0.530$ ($P < 0.001$)	$r = 0.545$ ($P < 0.001$)
Social	$r = 0.270$ ($P < 0.001$)	$r = 0.331$ ($P < 0.001$)	$r = 0.306$ ($P < 0.001$)
Environment	$r = 0.315$ ($P < 0.001$)	$r = 0.353$ ($P < 0.001$)	$r = 0.346$ ($P < 0.001$)
General	$r = 0.372$ ($P < 0.001$)	$r = 0.410$ ($P < 0.001$)	$r = 0.406$ ($P < 0.001$)

*Pearson's correlation (*r*)

disorders, such as those aforementioned [39]. Therefore, since major depression negatively affects the patients' perception of the self [40], world, and future, this cognitive triad [41] can affect the way these individuals perceive their psychological resilience. Various studies indicate that positive emotions protect psychological health by undoing or buffering against the effects of stress, making people more resilient against depression [6, 13, 42]. Although the bipolar disorder patients were euthymic, some studies show that the cognitive impairments will remain in these epochs, which could decrease critical judgment about their states of mind [43].

A positive statistically significant association was found between resilience and quality of life. Sociodemographic data seems to be associated with levels of resilience and suggests that personal factors could be more strongly associated with resilience. Factors such as age, years of education, IQ, and gender (female) seem to interfere with the levels of resilience differently in each disorder, probably because each disorder has different characteristics, course, and psychopathology. However, there is no sufficient evidence from other studies associating these factors.

In bipolar disorder, IQ and years of education seem to be differently associated, probably because intelligence involves different types of learning and cognitive skills that may differ from the formal learning of school years. In schizophrenia, years of education and being married are protective factors for better resilience performance. The rate of individuals with schizophrenia who are married is reportedly very low [42], which suggests that helping these patients increase their social skills and develop positive interpersonal relationships could improve their psychological resilience [45]. In addition, having a high IQ was inversely associated with levels of resilience, meaning the more insight the patient has, the worse they feel, leading to less psychological resilience. Unlike patients with bipolar disorder, for example, it seems that IQ works positively for better resilience. Sociodemographic results should be more explored in future research because it is a new possibility of association with mental disorders course. There is still no sufficient evidence in the literature.

It was not possible to establish a significant correlation between resilience and clinical measures. There was a tendency to correlate resilience with general psychiatric symptoms and depressive symptoms. Therefore, alleviating the symptoms of the disorder could be quite effective in improving these patients' adaptability and resilience. Toyoshima et al. (2019) suggested that symptoms of depression rather than subjective cognitive function may be strongly related to the quality of life [44].

The quality of life scale had a positive correlation with resilience that was statistically significant. The scale is divided into four domains (physical, social, environmental, and psychological). The current analysis showed the psychological domain presented the strongest association with resilience. This finding has not yet been described in the literature, and it is worth highlighting that the constructs of quality of life and resilience are mainly related to psychological character in that the ego's perception of the subject will be related to the way it perceives their capacity to face stressful situations and the way they perceive their quality of life [46].

The current correlation analyses are extremely important given the complexity of self-perceptive constructs, such as resilience and quality of life. Until recently, most studies have addressed resilience only as the individuals' ability to fight organic diseases. However, due to a greater awareness of posttraumatic stress disorder, research on resilience is more and more focused on the relationships between psychological resilience and mental disorders [15]. In view of the high incidence rates and prevalence of mental disorders in our society, modern psychiatry has been attaching increased importance to protective factors. However, studies addressing resilience and mental disorders have not comparatively investigated the various diagnoses and outcomes.

Because the resilience of individuals with severe mental disorders is related to the intensity of psychiatric symptoms (the more stable the patient, the more resilient they will be), the current findings have clinical implications. Comparison of the diagnoses of schizophrenia, bipolar disorder, and major depression [47] revealed that depressed patients had more clinical comorbidities and lower levels of resilience. In addition, there was a direct association between quality of life and resilience, and the psychological domain of the quality of life questionnaire was the most associated with resilience. Based on these findings, the importance of promoting and developing the individuals' ability to resolve conflicts and manage stress in the context of mental health should be highlighted [48], thereby promoting higher quality of life and greater resilience. In simple terms, psychological resilience may be a neuroprotective factor [24].

The present results indicate that patients with major depression presented lower resilience levels than those with bipolar disorder and schizophrenia. Depression symptoms and general psychiatric symptoms tended to associate with lower resilience scores. Also, we detected a direct association between quality of life and resilience, mainly for the psychological domain. Some sociodemographic factors like age, gender, years of education, marital status, and IQ may interfere with resilience levels in patients with severe mental disorders. Resilience was positively associated with quality of life. Thus, it deserves special attention, as it promotes more positive outcomes and improves the quality of life of hospitalized patients with severe mental disorders.

Limitations

The present study has some limitations. First, due to its cross-sectional design, a definitive causal relationship could not be determined because of the difficulty with analyzing individual trajectories of risk and resilience. Thus, a prospective investigation about the impact of early age experiences on the development of resilience during adulthood is suggested [40]. Since the RS was applied only at the time of hospital discharge, it is not known whether these levels will remain stable or whether the patients will have a new perception about their levels of resilience after the intervention during psychiatric hospitalization. Further studies are required to investigate in clinical trials the stability of the resilience construct. Thereby, it will be possible to invest in a resilience program for individuals with mental disorders that will positively impact their quality of life. The RS investigates personal traits, and since the resilience construct is considered a dynamic concept, resilience measures should be ideally combined with other scales that measure functioning and capacity to manage adverse circumstances [16]. Subjective assessments should be accompanied by objective information, which was restricted in this study.

Another limitation is the use of the RS to evaluate resilience scores. Although Cronbach's α is the most commonly used reliability coefficient, the fact that the scale is self-administered in a population of patients with alterations in self-perception makes its use questionable [40]. Another limitation is that the use of psychiatric medications was not controlled, and all patients included in the study were receiving these drugs at the time of data collection. The psychiatric comorbidities were not included in the analyses.

Conclusion

Comparison of resilience levels among the different disorders (schizophrenia, bipolar disorder, and major depression) showed that patients with major depression had lower levels of resilience. Sociodemographic data seems to be associated with levels of resilience, and it suggests that personal factors could be more strongly associated with resilience. Resilience was positively associated with quality of life and had a tendency associated with depressive and general psychiatric symptoms.

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Declarations

Conflict of interest The authors declares that there is no conflict of interest.

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