

# The Impact of Substance Use Disorder on Resilience in Patients with Type I Bipolar Disorder

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## ABSTRACT

**Background:** Recurrent, severe manic or hypomanic episodes characterize bipolar disorder (BD), a chronic mental condition. To be resilient is to be able to keep going even when things are difficult.

**Aim and objectives:** To assess resilience in cases with bipolar disorder (with and without comorbid substance use disorder (SUD)) in relation to personality traits.

**Subjects and Methods:** This was a cross-sectional comparative study performed at the outpatient clinic of Port Said Mental Health and Addiction Treatment Hospital in a time for a year starting from January 2022 to January 2023. 33 BD patients without SUD (Control Group) and 33 BD patients with SUD (Patient Group).

**Results:** There was no statistically significant variance found among the two groups regarding sociodemographic characteristics, social health domain, resilience, SES and EPQ domains. There was a statistically significant association among resilience and medical state. Also, the results showed statistically highly significant correlations between resilience and occupational state, drug/alcohol, legal state, family history, social state, and psychological state. Linear regression analysis predicted that the high the physical health score of QOL, and the reduce the ASI domains (medical, legal, psychological and family history) scores, the higher was the resilience.

**Conclusion:** We concluded that there was a negative impact of SUD on resilience in BD patients. Managing SUD in BD patients together with improving their medical, psychological, legal states and family history all can improve their resilience, and consequently better outcome of BD.

**Keywords:** Bipolar disorder, Substance use disorder, Resilience, Quality of life, Personality traits

## INTRODUCTION

Mania or hypomania, as well as frequent, severe episodes of depression, define bipolar disorder <sup>(1)</sup>.

Both substances use disorders and borderline personality disorders are prevalent in BD <sup>(2)</sup>. Both illnesses may originate from the same mechanism; for example, SUDs can trigger or predispose BD, and vice versa. BDs can also predispose SUDs, either by self-treatment or by being more sensitive to rewarding stimuli <sup>(3)</sup>. Substance use disorders in bipolar disorder may include symptoms of hypomania or self-medication for unpleasant symptoms <sup>(4)</sup>.

A crucial concept that arises in this setting is resilience. A person is resilient if they are able to positively adjust to challenging situations and continue to thrive despite facing threats, trauma, or major sources of stress, such as major health problems <sup>(5)</sup>.

In those with substance use disorders, resilience can lower stress levels and boost happiness. Perceived stress and positive affect are mediated to some extent by self-esteem and positive affect <sup>(6)</sup>.

The correlation among neuroticism and resilience was negative, while the correlation between extraversion and conscientiousness was positive <sup>(7)</sup>.

Researchers of the current study set out to determine what factors, if any, were associated with resilience in BD patients (those with and without co-occurring SUD).

## SUBJECTS AND METHODS

Between January 2022 and January 2023, researchers from Port Said Mental Health and Addiction

Treatment Hospital conducted a cross-sectional comparison study in their outpatient clinic. The studied group (66 patients) was divided into 2 groups; BD group (33 patients) and BD with comorbid SUD (BD+SUD) group (33 patients). Both sexes were included with age range of 18-45 years.

**Inclusion Criteria:** Patients fulfilling 'DSM-5-TR' Diagnostic Criteria of type I Bipolar Disorder, Patients fulfilling 'DSM-5-TR' Diagnostic Criteria of Substance Use Disorder, Adults (18-45 years), Both sexes, Duration of illness: 1 year at least and Educated (can read and write).

**Exclusion Criteria:** Patients with chronic debilitating medical conditions affecting mental health, Patients with any other comorbidity except substance use disorder, cases in manic episode, cases in depressive episode, Abstinent patients, Patients with poor insight and Illiterate patients.

**Sample size justification:** The sample size was determined using the following equation by Takazawa & Morita <sup>(8)</sup>

$$N = (Z_{\alpha/2} + Z_{\beta})^2 (p_1 - p_2)^2 / (p_1q_1 + p_2q_2)$$

**Where:**

- $n$  = sample size
- $Z_{\alpha/2} = 1.96$  (The critical value that divides the central ninety-five percent of the Z distribution from the five percent in the tail)
- $Z_{\beta} = 0.80$  (The critical value that separates the fewer twenty percent of the Z distribution from the up to eighty percent)

- P1 = proportion of resilience in BD patients who had high comorbid substance use disorders = 88.37 (Ayano *et al.*, 2017)<sup>(9)</sup>.
- P2 = proportion of resilience in BD patients who do not have high comorbid substance use disorders = 47.19% (Ayano *et al.*, 2017)<sup>(9)</sup>.
- $q = 1 - p$

So, thirty-one participants would make up the sample size calculation; but, after factoring in the projected drop-out rate (ten percent), the final count was thirty-three participants for each group.

**Study procedures**

Each patient underwent a clinical interview using the psychiatric sheet developed by the Faculty of Medicine at Suez Canal University. The MINI-International Neuropsychiatric Interview (MINI) was used to diagnose BD type -I and SUD, and the groups were then separated accordingly. Both groups were screened for the presence of manic and depressive episodes using the Young Mania Rating Scale (YMRS) and the Hamilton Depression Rating Scale (HAM-D), respectively.

**Ethical consideration:**

**The Psychiatry and Neurology Department of Suez Canal University's Faculty of Medicine gave their stamp of approval to every single study process. The research was approved by the Ethics Committee of the Faculty of Medicine. After explaining the study's**

**purpose to the patients, they gave their written informed consent to participate. The Helsinki Declaration was followed throughout the study's conduct.**

**Data management:**

All statistical analyses were carried out using SPSS for Windows version 22.0, which is developed and maintained by SPSS in Chicago, IL, USA. Shown as means ± SD or percentages, descriptive statistics were easy to understand. For the statistical analysis of categorical variables, the relevant tests were chi-square test and Monte Carlo (MC) test. Depending on the data's normality, an independent t-test or a Mann-Whitney U test were used to analyze means differences between the groups that were investigated. To find out how baseline and patient factors affected the study results, regression analysis was run. Spearman correlation test was used to correlate between two quantitative variables which were not normally distributed. A significance level of less than 0.05 was considered significant and less than 0.001 was considered highly significant.

**RESULTS**

Table (1) shows the sociodemographic characteristics, including gender, age, socioeconomic status, residence, marital status, education, occupational status of the studied groups. There was no statistically significant variance found between the two groups.

**Table (1): Comparison of sociodemographic data between both groups**

		BD		BD+SUD		p-value
		N=33	%	N=33	%	
<b>Gender</b>	Males	20	60.61%	27	81.82%	0.057
	Females	13	39.39%	6	18.18%	
<b>Age groups (years)</b>	mean ± SD	31.21 ± 6.65		34.88 ± 9.81		0.15 U= -1.42
	18-30	13	39.39%	14	42.42%	
	31-45	20	60.61%	19	57.58%	
<b>SES</b>	High (84-64)	1	3.03%	0	0%	0.347
	Middle (63-43)	12	36.36%	9	27.27%	
	Low (42-22)	20	60.6%	22	66.67%	
	Very low (21-3)	0	0%	2	6.06%	
<b>Residence</b>	Rural	6	18.18%	5	15.15%	0.318
	Urban	27	81.82%	28	84.85%	
<b>Marital status</b>	Single	8	24.24%	5	15.15%	0.563
	Married	24	72.73%	25	75.76%	
	Divorced	1	3.03%	2	6.06%	
	Widowed	0	0%	1	3.03%	
<b>Education</b>	Illiterate	1	3.03%	2	6.06%	0.355
	Reading and writing	0	0%	2	6.06%	
	Middle education	21	63.64%	22	66.67%	
	High education	11	33.33%	7	21.21%	
<b>Occupational status</b>	Not working	13	39.39%	7	21.21%	0.134
	Manual worker	13	39.39%	21	63.64%	
	Official worker	7	21.21%	5	15.15%	

SD: Standard deviation.

Table (2) reveals domains of quality of life as measured by the WHOQOL-BREF across the groups that were examined. It was found that the BD group had significantly higher scores in the physical health, psychological health, and environment domains compared to the BD+SUD group. When comparing the two groups' social health, no statistically significant difference was found.

**Table (2): Comparison of quality of life using WHOQOL-BREF between both groups**

WHOQOL-BREF	BD		BD+SUD		Test of significance
<b>Physical health</b> Mean ±SD	76.12 ±16.11		61.91 ±23.06		U=3.84 P <0.001
	N=33	%	N=33	%	
Low (45-0)	2	6.06%	8	24.24%	MC=4.5 p=0.105
Moderate (65-46)	8	24.24%	8	24.24%	
Relatively high (100-66)	23	69.7%	17	51.52%	
<b>Psychological health</b> Mean ±SD	77.18 ±16.42		58.09 ±25.69		U = 4.5 P < 0.001
	N=33	%	N=33	%	
Low (45-0)	1	3.03%	10	30.3%	MC=10.72 <b>p=0.005*</b>
Moderate (65-46)	7	21.21%	9	27.27%	
Relatively high (100-66)	25	75.76%	14	42.42%	
<b>Social health</b> Mean ±SD	58.15 ±34.99		57.03 ±28.55		U= .332 P =0.97
	N=33	%	N=33	%	
Low (45-0)	11	33.33%	14	42.42%	MC=0.617 p=0.734
Moderate (65-46)	3	9.09%	3	9.09%	
Relatively high (100-66)	19	57.58%	16	48.48%	
<b>Environment</b> Mean ±SD	75.45 ±16.84		64.24 ±21.31		U = 2.9 P < 0.001
	N=33	%	N=33	%	
Low (45-0)	2	6.06%	10	30.3%	MC=7.48 <b>p=0.024*</b>
Moderate (65-46)	7	21.21%	8	24.24%	
Relatively high (100-66)	24	72.73%	15	45.45%	

\*: Statistically significant. \*\*: Statistically highly significant. U: Mann-Whitney U Test, MC: Monte Carlo test, BD: Bipolar disorder group, BD+SUD: Bipolar disorder with substance use disorder group, WHOQOL-BREF: World Health Organization-Quality of life-BREF, SD: Standard deviation.

Table (3) shows the distribution of means of addiction severity index (ASI) domains' composite scores among BD+SUD group. It showed that cases scored highest (which means the worst) in the psychological state domain. The distribution in descending order from the highest to the lowest domains (meaning from the worst to the best domains) was as following: psychological state, occupational state, social state, drug-alcohol, family history, medical state, and finally legal state.

**Table (3): Distribution of addiction severity index (ASI) among cases with both BD and SUD group**

ASI	BD+SUD mean ±SD
Medical state	0.033 ±0.13
Occupational state	0.310 ±0.20
Drug-alcohol	0.143 ±0.100
Legal state	0.0226 ±0.06
Family history	0.0688 ±0.097
Social state	0.257 ±0.118
Psychological state	0.365 ±0.221

BD: Bipolar disorder group, BD+SUD: Bipolar disorder with substance use disorder group, ASI: addiction severity index.

Table (4) shows the correlation between resilience measured by CD-RISC-25 and gender, age, SES, QOL and EPQ main domains among BD+SUD group. It showed statistically highly significant positive correlations between resilience and physical health, psychological health and environment. Also, it showed statistically significant positive correlation between resilience and social health. There wasn't statistically significant distinction among resilience and gender, age, SES and EPQ domains.

**Table (4): Correlation between CD-RISC-25 and demographic, quality of life and EPQ main domains among cases of both BD and SUD group**

BD +SUD	CD-RISC-25	
	r	p-value
Gender	0.213	0.254
Age/years	- 0.044	0.807
SES	- 0.095	0.60
Residence	0.015	0.819
Marital status	0.038	0.795
Education	0.052	0.699
Occupational status	0.01	0.995
QOL (physical health)	<b>0.66</b>	<b>&lt; 0.001**</b>
QOL (psychological health)	<b>0.638</b>	<b>&lt; 0.001**</b>
QOL (social health)	<b>0.508</b>	<b>0.003*</b>
QOL (environment)	<b>0.653</b>	<b>&lt; 0.001**</b>
EPQ (psychoticism)	0.023	0.901
EPQ (extraversion)	0.025	0.891
EPQ (neuroticism)	- 0.037	0.836
EPQ (lying)	- 0.309	0.08

\*: Statistically significant \*\*: Statistically highly significant, r: Spearman correlation coefficient, BD+SUD: Bipolar disorder with substance use disorder group, CD-RISC-25: Connor-Davidson Resilience Scale-25, SES: Socioeconomic status, QOL: Quality of Life, EPQ: Eysenck Personality Questionnaire.

Table (5) shows the correlation between resilience determined by CD-RISC-25 and ASI main domains among cases of BD and SUD group. It showed statistically significant correlation between resilience and medical state. Also, it showed statistically highly significant correlations between resilience and occupational state, drug/alcohol, legal state, family history, social state, and psychological state.

**Table (5): Correlation between CD-RISC-25 and ASI main domains among cases of BD and SUD group**

ASI	CD-RISC-25	
	r	p-value
Medical state	<b>- 0.414</b>	<b>0.017*</b>
Occupational state	<b>- 0.987</b>	<b>0.001**</b>
Drug/alcohol	<b>- 0.990</b>	<b>0.001**</b>
Legal state	<b>- 0.813</b>	<b>0.001**</b>
Family history	<b>- 0.927</b>	<b>0.001**</b>
Social state	<b>- 0.995</b>	<b>0.001**</b>
Psychological state	<b>- 0.989</b>	<b>0.001**</b>

\*: Statistically significant. \*\*: Statistically highly significant, r: Spearman correlation coefficient, ASI: Addiction severity index, CD-RISC-25: Connor-Davidson Resilience Scale-25.

Table (6) shows the linear regression for prediction of resilience among BD+SUD cases. It stated that the increase in QOL physical health and decrease in ASI medical, legal state, family history, psychological states predict increase in resilience.

**Table (6): Linear regression for prediction of resilience among BD+SUD group**

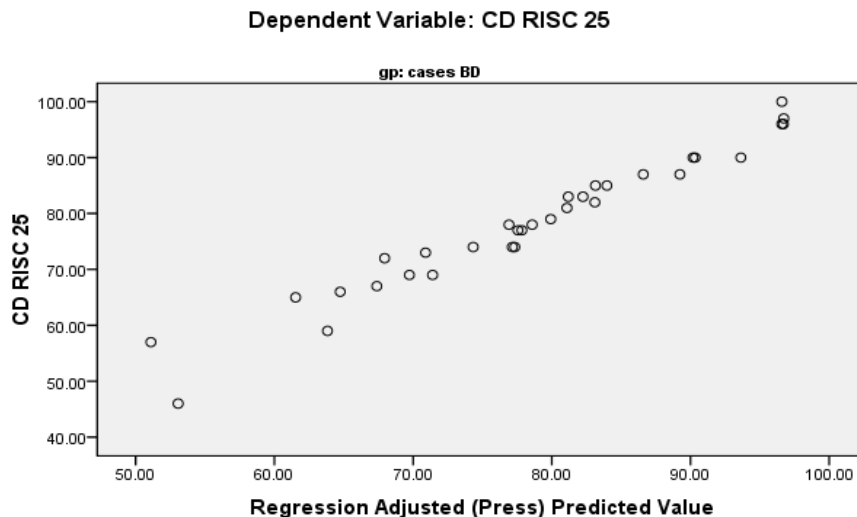
Model (BD+SUD cases)	Unstandardized Coefficients		Standardized Coefficients	t	p value
	B	Std. error	Beta		
2 (Constant)	<b>99.407</b>	<b>3.162</b>		<b>31.441</b>	<b>0.001**</b>
Gender	0.512	0.678	0.016	0.754	0.463
Age/years	- 0.033	0.046	- 0.018	- 0.713	0.488
SES	- 0.046	0.050	- 0.036	- 0.912	0.377
Residence	0.125	0.012	0.09	1.20	0.895
Marital status	1.32	0.08	1.05	0.178	0.425
Education	0.978	0.01	0.054	0.145	0.481
Occupational status	0.07	0.04	0.001	0.951	0.189
QOL (physical health)	<b>0.068</b>	<b>0.031</b>	<b>0.089</b>	<b>2.178</b>	<b>0.047*</b>
QOL (psychological health)	- 0.040	0.031	- 0.054	- 1.288	0.219
QOL (social health)	0.000	0.011	- 0.001	- 0.046	0.964
QOL (environmental)	0.004	0.029	0.005	0.134	0.895
EPQ (psychoticism)	- 0.035	0.108	- 0.008	- 0.321	0.753
EPQ (extraversion)	0.074	0.064	0.030	1.165	0.264
EPQ (neuroticism)	- 0.012	0.081	- 0.005	- 0.144	0.887
EPQ (lying)	- 0.067	0.058	- 0.029	- 1.156	0.267
ASI medical state	<b>25.227</b>	<b>9.310</b>	<b>- 0.281</b>	<b>2.710</b>	<b>0.017*</b>
ASI occupational state	- 6.322	10.421	- 0.106	- 0.607	0.554
ASI drug/alcohol	- 38.790	29.557	- 0.318	- 1.312	0.210
ASI legal state	<b>- 121.383</b>	<b>27.603</b>	<b>- 0.629</b>	<b>- 4.397</b>	<b>0.001**</b>
ASI family history	<b>58.216</b>	<b>19.601</b>	<b>- 0.462</b>	<b>2.970</b>	<b>0.01*</b>
ASI social state	- 14.058	13.095	- 0.136	- 1.074	0.301
ASI psychological state	<b>- 32.238</b>	<b>5.650</b>	<b>- 0.583</b>	<b>- 5.705</b>	<b>0.001**</b>

R<sup>2</sup> = 0.996

Groups: cases BD+SUD coded as 2, \*: Statistically significant. \*\*: Statistically highly significant. BD+SUD: Bipolar disorder with substance use disorder group, SES: Socioeconomic status, QOL: Quality of Life, EPQ: Eysenck Personality Questionnaire, ASI: Addiction severity index.

Figure (1) shows the prediction equation for CD-RISC-25 was 99.407. It revealed that the standardized coefficient for QOL physical health was 0.089 (p = 0.047), ASI medical was - 0.281 (p= 0.017), ASI legal was - 0.629 (p= 0.001), ASI family history was - 0.462 (p= 0.01), and ASI psychological was - 0.583 (p= 0.001).

**Scatterplot**



**Figure (1): Scatter plot diagram illustrates linear regression for prediction of resilience among BD+SUD group**

## DISCUSSION

Both sexes were included with age range of 18-45 years. The BD group was composed of twenty males (60.61 percent) and thirteen females (39.39%). While the BD+SUD group was composed of 27 males (81.82%) and 6 females (18.18%). The mean of age in BD group was 31.21 ( $\pm 6.65$ ), while that of BD+SUD group was 34.88 ( $\pm 9.81$ ).

Most of the individuals were categorized in the low SES; 20 (60.6%) in BD group and 22 (66.67%) in BD+SUD group. They were mostly from urban residency; 27 (81.82%) in BD group and 28 (84.85%) in BD+SUD group. They were mostly married 24 (72.73%) in BD group and 25 (75.76%) in BD+SUD group. The educational statuses of BD group were of middle 21 (63.64%) and high 11 (33.33%) education levels. And those of BD+SUD group were of middle 22 (66.67%) and high 7 (21.21%) education levels. The occupational statuses of BD group were 13 (39.39%) not working, and 13 (39.39%) manual workers. While those of BD+SUD group were mostly manual workers 21 (63.64%).

Our study revealed no statistically significant variances among the studied groups regarding all sociodemographic variables.

Also, our study of resilience by CD-RISC-25 among the studied groups showed that resilience of BD group was significantly higher than that of bipolar with substance use disorders group ( $p = 0.003$ ).

**Rudzinski et al.** <sup>(10)</sup> conducted a scoping review, which supports our explanation. It was proposed that SUD is portrayed as the polar opposite of resilience. It portrayed SUD as a faulty coping mechanism that implied a lack of resilience. As a result, the comorbidity will jeopardize resilience.

In our study, the comparison of quality of life using WHOQOL-BREF between the studied groups showed a statistically significant better quality of life in BD group compared to BD with SUD group in domains of physical health, psychological health and environmental domain; and no statistically significant variance in social health domain between the 2 groups.

The negative impact of SUD on physical health could be attributed to many factors as presence of other comorbid physical illnesses, poly drug use, drug interactions, accidental overdose or withdrawal symptoms. They showed also, poor medication adherence and compliance <sup>(11)</sup>.

Our study found statistically significant difference between both groups regarding personality traits. Extraversion trait was found to be higher in BD with SUD group than the BD group. We can explain this by mentioning that extraverts have more a heightened sensitivity to pleasant stimuli, novelty seeking, impulsivity and engaging in risky activities including substance abuse, more social with advanced social skills giving them the chance to be exposed to substance

abusers compared to introverts. All will attract BD patients with such trait to addiction, and further worsened resilience <sup>(12)</sup>

Our study found no statistically significant variance between both groups regarding psychoticism, neuroticism and lying traits. Regarding neuroticism, we can refer this to the negative emotional burden among both groups. Regarding psychoticism, only one case in BD with comorbid SUD scored higher psychoticism, which may be due to that the sample was not big enough. And no difference was found between both groups regarding lying, is probably due to the observer bias.

A study agrees with us found that BD patients with high extraversion scores were positively correlated with impulsivity trait, which is associated with SUD and deteriorated resilience <sup>(13)</sup>.

A study found opposite results, that BD with comorbid SUD were more introverts, had more feeling sensing, and perceiving preferences compared to BD cases without comorbid SUD <sup>(14)</sup>.

Our results found negative correlation between ASI and QOL scores among BD and SUD group. But no statistically significant correlations were found between ASI and sociodemographic or EPQ domains.

Consistent with what we found, **Campêlo et al.** <sup>(15)</sup> stated that the WHOQOL-BREF domains were found to have a negative correlation with the severity of drug dependence dimensions for psychiatric, alcohol, legal, medical, family/social support, and family/social problems. The deterioration in the quality of life experienced by those who use drugs is due to more than just the frequency or quantity of substance use; it is accompanied by negative impacts in other aspects of their lives, the severity of which might vary.

We found that in BD group linear regression analysis; sociodemographic data, QOL and EPQ subdomains did not have significant correlation with or predict resilience. On the other hand, BD and SUD group, the linear regression analysis revealed that the increase in QOL (physical health) predicts increase in resilience. While the increase in ASI medical state, ASI legal state, ASI family history and ASI psychological state predict decrease in resilience. When compared with each other, increase in ASI medical state, ASI legal state, ASI family history, and ASI psychological state predict decrease in resilience. The increase in QOL (physical health) predicts increase in resilience.

Our findings are in line with those of **Jodis et al.** <sup>(16)</sup> who found that a number of risk factors for substance abuse and addiction, including exposure to negative peer influences, inadequate supervision, a lack of emotional warmth or rejection from parents, living in a low-income area, having easy access to substances, starting to use drugs at a young age, witnessing community norms around substance abuse, and being unemployed, can reduce resilience and stress tolerance.

## CONCLUSION

We concluded that there is a negative impact of SUD on resilience in BD patients. BD with SUD patients had lower resilience than that of BD patients without SUD. In patients with BD who do not have SUD, resilience and physical health are positively correlated. There are negative correlations between ASI domains and resilience, and ASI domains and QOL domains in BD with SUD group. Poor physical, medical, psychological, legal states and positive family history of SUD, all predict lower resilience. Conclusively, managing SUD in BD patients together with improving their medical, psychological, legal states and family history all can improve their resilience, and consequently better outcome of BD.

## DECLARATIONS

- **Funding:** No fund
- **Availability of data and material:** Available
- **Conflicts of interest:** No conflicts of interest.
- **Competing interests:** None

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