Gender Differences in Stability and Plasticity Personality Meta-Traits Among Patients With Depressive Disorder: A Cross-Sectional Study

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Abstract

Background

Personality traits significantly influence vulnerability, clinical expression, and course of depressive disorders. Recent hierarchical personality models propose that the Big Five personality traits can be organized into higher-order meta-traits of stability and plasticity. Evidence on gender differences in these meta-traits among patients with depressive disorder is limited, particularly in the Indian sociocultural context.

Aim

To examine gender differences in stability and plasticity personality meta-traits among patients with depressive disorder and to explore their association with depression severity.

Methods

This cross-sectional study was conducted at a tertiary care hospital in Tamil Nadu. Sixty-five patients (30 females and 35 males) aged 18–60 years diagnosed with depressive disorder as per ICD-11 criteria were recruited using convenience sampling. Sociodemographic and clinical variables were collected. Depression severity was assessed using the Hamilton Depression Rating Scale (HDRS). Personality traits were assessed using the Big Five Personality Scale and grouped into stability and plasticity meta-traits. Statistical analysis was performed using independent t-tests, chi-square tests, and Fisher's exact tests.

Results

Most sociodemographic variables were comparable between genders, except for type of family. Males had a significantly longer duration of illness, while psychiatric comorbidity was more common among females. Stability was the predominant personality meta-trait in both genders. No significant gender differences were observed in stability or plasticity scores. Personality meta-traits were not associated with depression severity.

Conclusion

Stability emerged as the predominant personality meta-trait among patients with depressive disorder irrespective of gender. Stability and plasticity appear to function as trait-level vulnerability factors independent of current depressive severity.

Keywords: Depressive disorder; Gender differences; Stability; Plasticity; Personality meta-traits

Introduction

Depressive disorder is a major cause of global disability, linked to considerable psychosocial impairment and a decreased quality of life. [1]. Although biological and environmental factors are key to its causes, personality traits are increasingly seen as persistent vulnerability factors that affect the development, manifestation, and progression of depression.[2].

Neuroticism, extraversion, agreeableness, conscientiousness, and openness to new experiences are the five major dimensions that make up the Five-Factor Model of personality [3]. Beyond these traits,

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hierarchical models have demonstrated that personality can be organized into two higher-order meta-traits: stability and plasticity [15–18]. Stability includes low neuroticism, agreeableness, and conscientiousness and represents social conformance, emotional management, and impulsive control. Plasticity includes extraversion and openness and reflects behavioral exploration, cognitive flexibility, and engagement with novelty. [16].

Higher neuroticism and lower extraversion have been repeatedly linked to depression, indicating greater rigidity and decreased adaptive flexibility.[4–6]. Although gender differences in depression prevalence are well established, evidence regarding gender differences in higher-order personality organization among depressed individuals remains limited, especially in non-Western settings [7,8]. Despite the well-established gender differences in depression prevalence, there is still little evidence of gender differences in higher-order personality organization among depressed individuals, especially in non-Western contexts [7, 8].

Materials and Methods

This hospital-based cross-sectional study was conducted in the Department of Psychiatry at a tertiary care hospital in Tamil Nadu. Patients attending outpatient and inpatient services were recruited using convenience sampling. The study included 65 patients (30 females and 35 males) aged between 18 and 60 years. Sample size was calculated using correlation coefficient of 0.12 between gender and depression scores with 95% confidence interval and 90% power, the minimum required sample was 26 per group. To improve precision a total of 65 participants were taken.

Inclusion criteria were diagnosis of depressive disorder as per ICD-11 criteria, ability to provide informed written consent, and absence of medical comorbidities. Patients with other psychiatric disorders or unwilling to participate were excluded. Ethical approval was obtained from the Institutional Ethics Committee prior to data collection.

Sociodemographic and clinical details were recorded using a semi-structured proforma. Severity of depression was assessed using the Hamilton Depression Rating Scale (HDRS), a clinician-rated scale widely used in both clinical and research settings [9].

The Big Five Personality Scale was used to evaluate personality traits. Two higher-order meta-traits were identified based on hierarchical personality frameworks: plasticity (extraversion and openness to experience) and stability (emotional stability, agreeableness, and conscientiousness) [15–18]. Mean scores were calculated for each meta-trait and used for analysis.

Data were analyzed using SPSS software. Continuous variables were expressed as mean ± standard deviation and compared using independent t-tests. Categorical variables were expressed as frequencies and percentages and analyzed using chi-square or Fisher's exact tests. A p value < 0.05 was considered statistically significant.

Results

A total of 65 patients diagnosed with depressive disorder were included in the study, comprising 30 females (46.2%) and 35 males (53.8%). The mean age of females was 35.56 ± 8.79 years, while that of males was 34.20 ± 6.97 years, with no statistically significant gender difference (t = 0.67, p = 0.50). Distribution across age categories also did not differ significantly between genders (χ^2 = 3.03, p = 0.395). Sociodemographic variables including religion (χ^2 = 0.24, p = 0.88), educational status (χ^2 = 3.53, p = 0.32), occupation (χ^2 = 4.01, p = 0.26), marital status (χ^2 = 0.98, p = 0.61), place of residence (χ^2 = 0.07, p = 0.79), and socioeconomic status (χ^2 = 2.69, p = 0.44) were comparable between females and males. A statistically significant gender difference was observed with respect to type of family, with a higher proportion of males belonging to nuclear families (χ^2 = 3.95, p = 0.047).

With regard to clinical variables, the mean age of onset of depressive illness did not differ significantly between females and males (29.1 ± 6.24 years vs 28.6 ± 5.91 years; t = 0.60, p = 0.55). The mean duration of illness was significantly longer among males compared to females (32.57 ± 6.36 months vs 20.40 ± 8.29 months; t = 6.68, p < 0.001). The duration of the current depressive episode was comparable between females and males (6.53 ± 2.21 months vs 7.17 ± 2.64 months; t = 1.48, p = 0.14). The course of illness (episodic versus continuous) did not differ significantly between genders (χ^2 = 0.05, p = 0.83). The number of depressive episodes (single, two, or three or more) was also comparable between females

and males (χ^2 = 0.40, p = 0.82). History of previous psychiatric hospitalization did not show a statistically significant gender difference (χ^2 = 1.99, p = 0.16). Psychiatric comorbidity was significantly more common among females than males (χ^2 = 5.31, p = 0.02). None of the participants reported a family history of psychiatric illness.

Assessment of depressive severity using the Hamilton Depression Rating Scale revealed no statistically significant difference in the distribution of mild and moderate depression between females and males (χ^2 = 0.19, p = 0.667). Among patients with mild depression, the mean HDRS score was 9.96 ± 1.28 in females and 9.76 ± 1.27 in males, with no statistically significant difference (t = 0.51, p = 0.61). Similarly, among patients with moderate depression, mean HDRS scores were 19.10 ± 0.82 in females and 18.60 ± 1.07 in males, which did not differ significantly (t = 1.17, p = 0.25).

Analysis of personality meta-traits revealed that stability was the predominant personality orientation in both females and males. Stability was observed in 28 females (93.33%) and 29 males (82.86%), while plasticity was observed in 2 females (6.67%) and 6 males (17.14%). The gender-wise distribution of stability and plasticity did not differ significantly (Fisher's exact test, p = 0.27). Mean stability scores were slightly lower in females than males (18.25 ± 2.67 vs 19.28 ± 2.35), though this difference was not statistically significant (t = 1.66, p = 0.10). Mean plasticity scores were also comparable between females and males (24.60 ± 3.64 vs 23.58 ± 3.05; t = 1.18, p = 0.24).

Further comparison of personality meta-traits across depression severity categories revealed no statistically significant differences. Patients with mild depression had a mean stability score of 18.86 ± 2.29, while those with moderate depression had a mean score of 18.61 ± 3.37, with no statistically significant difference (t = 0.30, p = 0.76). Mean plasticity scores were 24.19 ± 3.39 in patients with mild depression and 23.52 ± 3.21 in those with moderate depression, which also did not differ significantly (t = 0.78, p = 0.4)

Discussion

The current study emphasizes that stability-oriented personality meta-traits are more common in depressed patients, regardless of gender. This result is in line

with previous research that links depression to increased behavioral inhibition, decreased adaptive flexibility, and difficulties regulating emotions [4,10].Stability-related traits such as conscientiousness and agreeableness, while adaptive in normative contexts, may predispose individuals to internalization of distress and maladaptive coping. The lack of discernible gender differences in stability and plasticity implies that, once depression is established, higher-order personality organization has a comparable impact on both genders. This lends credence to hierarchical personality models that suggest stability and plasticity are trait-level, biologically based constructs that are largely constant across demographic factors [16–18]. While gender differences in depression prevalence are well documented, the present findings suggest that underlying personality architecture may be comparable among clinically depressed males and females.

The significantly longer duration of illness observed among males may reflect delayed help-seeking behavior, sociocultural norms discouraging emotional disclosure, and reduced utilization of mental health services among men [11]. In contrast, the higher prevalence of psychiatric comorbidity among females aligns with robust evidence indicating greater internalizing tendencies and anxiety-related comorbidity in women with depressive disorders [7,12].

IImportantly, the lack of association between HDRS severity and personality meta-traits indicates that stability and plasticity are not merely reflections of current symptom burden. Instead, they seem to serve as persistent vulnerability factors that endure during both the symptomatic and remission stages. Longitudinal studies have similarly demonstrated that personality traits remain stable over time and predict chronicity, relapse, and treatment response in depression [13,14].

In the Indian sociocultural context, emphasis on conformity, emotional restraint, and interpersonal harmony may further reinforce stability-oriented traits, potentially influencing both vulnerability to depression and illness expression [8]. From a clinical standpoint, integrating assessment of personality meta-traits into routine evaluation may facilitate individualized treatment planning, with interventions

targeting emotional regulation, cognitive flexibility, and behavioral activation tailored to dispositional patterns rather than symptom severity alone.

Limitations

The cross-sectional design limits causal inference. The modest sample size and single-center setting restrict generalizability. Grouping personality traits into higher-order meta-traits may oversimplify dimensional complexity.

Conclusion

Stability is the predominant personality meta-trait among patients with depressive disorder, independent of gender and depressive severity. Stability and plasticity appear to represent trait-level vulnerability factors rather than state-dependent correlates of depression. Incorporating personality meta-trait assessment into clinical practice may enhance personalized and long-term management strategies.

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Table 1 : Sociodemographic characteristics of males and females in depressive disorder patients

		Female (n=30)	Male (n=35)	P value
Age		35.566 ± 8.791	34.2 ± 6.973	0.50
Age (years)	<30	8(26.66)	15(42.86)	
	31 to 40	13(43.33)	12(34.28)	
	41 to 60	9(30.0)	8(22.85)	0.395
Religion	Hindu	26(86.66)	31(88.57)	
	Christian	1(3.33)	2(5.71)	
	Muslim	3(10.0)	2(5.71)	0.744
Education	Primary school	1(3.33)	3(8.57)	
	Middle school	7(23.33)	12(34.28)	
	High school	7(23.33)	9(25.71)	
	Graduate	15(50.0)	11(31.428)	0.421
Occupation	Skilled	6(20.0)	8(22.86)	
	Semi skilled	11(36.66)	21(60.0)	
	Unskilled	13(43.33)	6(17.14)	0.059
Residence	Rural	19(63.33)	20(57.14)	
	SemiUrban	7(23.33)	9(25.71)	
	Urban	4(13.33)	6(17.15)	0.864
Marital status	Married	22(73.33)	20(57.14)	0.271

	Unmarried	8(26.66)	15(42.86)	
Type of family	Nuclear	22(73.33)	33(94.28)	
	Joint	8(26.66)	2(5.714)	0.047
Socioeconomic status	Lower middle	26(86.66)	26(74.28)	0.351

Table 2 : Clinical characteristics of males and females with depressive disorder

		Female n=30	Male n=35	P value
Age of onset (in years) , mean ± SD		33.7 ± 8.29	32.57 ± 6.36	0.55
Duration of illness(in months), mean ±SD		20.4 ± 8.29	32.57 ± 6.36	<0.001
Duration of current episode (in months), mean ± SD		9.2 ± 7.65	6.8 ± 4.66	0.14
Course of illness	Episodic	12	12	
	Continuous	18	23	0.83
Number of illness episodes	0	18	23	
	1	8	7	
	≥2	4	5	0.25
Previous hospitalisation	Yes	2	7	
	No	28	28	0.16
Comorbidity	Yes	7	1	
	No	23	34	0.02
Family history	Yes	0	0	
	No	30	35	1

Table 3 : Comparision of HAM - D scores between both the genders

		Female	Male	P value
Hamilton depression rating scale (number of individuals)	Mild	19(63.33)	25(71.42)	0.667
	Moderate	11(36.66)	10(28.58)	
Severity of current episode	Mild	9.96 ± 1.28	9.76 ± 1.27	0.61
	Moderate	19.1 ± 0.82	18.6 ± 1.07	0.25

Table 4 : Comparision of personality between both the genders

		Female	Male	P value
Stabilty	Number of individuals	28(93.33)	29(82.86)	0.27
Plasticity		2(6.66)	6(17.14)	
Stability	Mean	18.25 ± 2.67	19.28 ± 2.35	0.10
Plasticity		24.6 ± 3.64	23.58 ± 3.05	0.24

Table 5 : Association between personality and depression scores

	HDRS		
	Mild	Moderate	p value
Stability	18.86 ± 2.29	18.61 ± 3.37	0.76
Plasticity	24.19 ± 3.39	23.52 ± 3.21	0.44