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An integrative study of temperament-specific susceptibility to stress-related emotional symptoms in premenstrual syndrome

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Abstract
Premenstrual syndrome (PMS) is characterized by recurring emotional and physical symptoms during the luteal phase of the menstrual cycle, with stress recognized as a major exacerbating factor. This study investigates the influence of psychosocial stress on emotional PMS symptoms-such as mood swings, irritability, and anxiety-across different Unani temperaments (Mizaj). A total of 119 participants were assessed using standardized temperament classification, the Anxiety-Depression-Stress Scale (ADSS), and a structured menstrual symptom evaluation. Temperament-specific variations in emotional PMS symptoms were analyzed. Logistic regression identified temperament as the strongest predictor of emotional PMS symptoms. Safrawi (choleric) women demonstrated significantly higher odds of irritability, tension, and mood swings compared to Balghamī (phlegmatic) women (B = +2.68, p = 0.005). While stress levels were moderately correlated with overall PMS severity, they did not independently predict emotional symptoms when temperament was taken into account. These findings suggest temperament is the dominant determinant of emotional PMS vulnerability, with stress acting as an amplifier. Integrating Unani and modern perspectives underscores the importance of temperament-based, personalized interventions in managing PMS.

Keywords: Premenstrual syndrome, stress, temperament, Mizaj, emotional symptoms, Unani medicine

Introduction
Premenstrual syndrome (PMS) affects nearly 30-40% of reproductive-age women globally and is marked by affective, behavioral, and somatic symptoms recurring in the luteal phase [1, 2]. Emotional symptoms-irritability, tension, short-temperedness, and depression-are particularly distressing and impair daily functioning [3]. Stress is a key trigger and amplifier of PMS symptoms, mediated by the dysregulation of the HPA axis and neurotransmitters such as serotonin and GABA, which play central roles [4, 5].

Unani medicine conceptualizes PMS as a manifestation of Su-e-Mizaj (deranged temperament), where imbalance in the four humors, Dam (sanguine), Safra (choleric), Balgham (phlegmatic), and Sauda (melancholic) affects emotional and reproductive health [6, 7]. Classical scholars emphasized the psychosomatic link between stress, emotion, and physiology through Harkat-o-Sukoon-e-Nafsani (mental movement and stillness) [8].

Although stress has been extensively studied in PMS, limited evidence explores temperament-specific differences in stress reactivity. Safrawi and Saudawi women are hypothesized to exhibit stronger emotional symptoms due to heightened cortisol reactivity and lower stress tolerance, while Damvi women are more resilient, and Balghami women exhibit more stable responses [9, 10].

This study examines the interaction between stress and Mizaj (temperament) in shaping emotional PMS symptoms, integrating modern psychoneuroendocrinology with classical Unani principles.

Materials and Methods
This study was conducted after getting ethical clearance from the Institutional Ethical Committee of Aligarh Muslim University.

Study Design: A cross-sectional observational design was used to assess the impact of psychosocial stress on emotional PMS symptoms across different temperaments.

Study Population: Women aged 19-28 years were recruited and classified into Safrāwī (choleric) and Balghamī (phlegmatic) groups using a standardized Unani temperament assessment tool.

Inclusion Criteria: Apparently healthy participants, aged 19-28 years, Unmarried, no psychiatric or endocrine disorders

Exclusion Criteria: Below 19 years and above 28 years of age, Married, Pregnancy, lactation, or hormonal therapy, Chronic illness or medication affecting stress/cortisol.

Tools used

1. Standard Unani diagnostic questionnaire- Temperament (Mizaj) Classification
2. Anxiety Depression Stress Scale (ADSS-BSPSA) - Stress Assessment. (Borenstein *et al*., 2003).
3. ACOG (the American College of Obstetricians and Gynecologists) PMS criteria- to assess Emotional PMS Symptoms (Irritability, tension, short-tempered, and depression).

Statistical Analysis

- Independent t-test for between-group comparisons.
- Pearson correlation for stress and PMS severity.
- Logistic regression for predictors of emotional PMS symptoms.
- $p< 0.05$ is considered statistically significant.

Results and Observations

Table 1: Descriptive Statistics

		Mizaj	Tension	Short-tempered	Depression	Irritability	Stress
N	Valid	119	119	119	119	119	119
	Missing	0	0	0	0	0	0
Mean		1.50	.55	.59	.45	.51	1.2437
Std. Error of Mean		.046	.046	.085	.046	.046	.03952
Std. Deviation		.502	.500	.924	.500	.502	.43113
Variance		.252	.250	.854	.250	.252	.186
Skewness		.017	-.188	6.415	.188	-.051	1.209
Std. Error of Skewness		.222	.222	.222	.222	.222	.222
Kurtosis		-2.034	-1.999	58.176	-1.999	-2.032	-.547
Std. Error of Kurtosis		.440	.440	.440	.440	.440	.440
Minimum		1	0	0	0	0	1.00
Maximum		2	1	9	1	1	2.00
Percentiles	25	1.00	.00	.00	.00	.00	1.0000
	50	1.00	1.00	1.00	.00	1.00	1.0000
	75	2.00	1.00	1.00	1.00	1.00	1.0000

Table 1 displays the descriptive statistics of all study variables, including *Mizaj*, tension, short-tempered behavior, depression, irritability, and stress.

The mean values suggest moderate levels of *Mizaj* (M = 1.50) and stress (M = 1.24), whereas emotional symptoms-tension, short-tempered behavior, depression, and irritability-show relatively low means (ranging from 0.45 to 0.59). This indicates that emotional symptoms occurred less frequently among participants.

Standard deviations were generally low, indicating homogeneity across the sample, except for short-tempered behavior, which showed higher variability (SD = 0.924). Skewness and kurtosis revealed approximate normality for most variables, though short-tempered behavior showed a high positive skewness (6.415) and kurtosis (58.176), implying a concentration of low scores in that domain.

Overall, descriptive results point toward a predominantly mild emotional symptom profile, with stress and temperament showing moderately elevated mean values.

Table 2: Frequency distribution

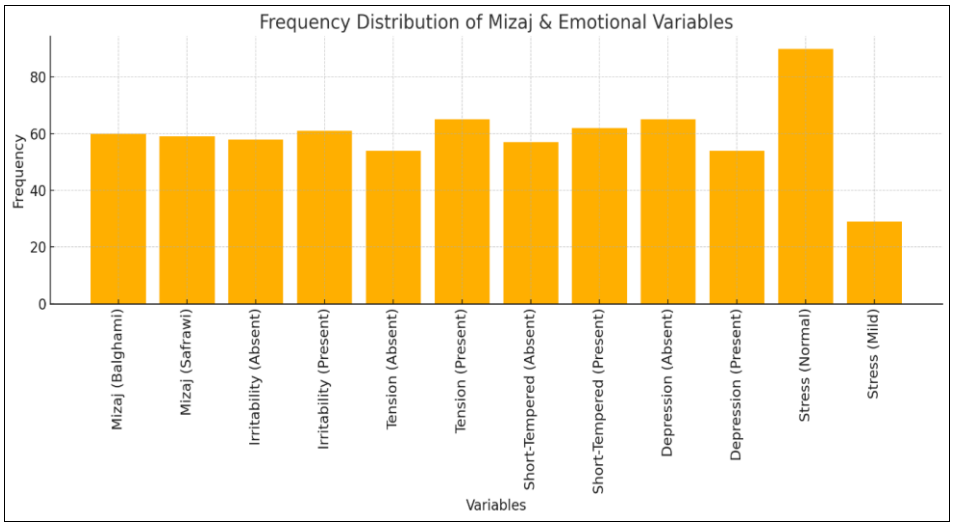
Variable	Frequency (119)	Percentage (%)
Mizaj-Balghami	60	50.4
Mizaj- Safrawi	59	49.6
Irritability (0)	58	48.7
Irritability (1)	61	51.3
Tension (0)	54	45.4
Tension (1)	65	54.6
Short-Tempered (0)	57	47.9
Short-Tempered (1)	62	52.1
Depression (0)	65	54.6
Depression (1)	54	45.4
Stress- Normal	90	75.6
Stress- Mild	29	24.4

Among the 119 participants, 60 were Balghami and 59 were Safrawi Temperament, nearly evenly distributed, ensuring balanced representation for comparative analysis between the two temperaments. In the frequency distribution of Emotional Premenstrual Symptom, 51.3% reported irritability before menstruation, while 48.7% denied such symptoms. A total of 54.6% experienced premenstrual tension, whereas 45.4% did not. The presence of tension

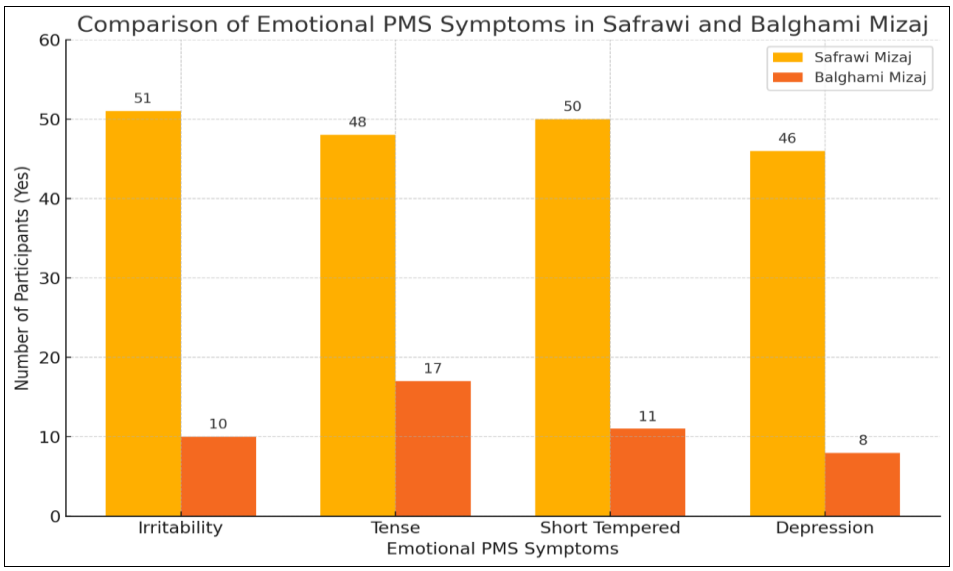
was slightly higher compared to irritability, suggesting that anxiety-related symptoms were more prevalent. 52.1% of subjects reported becoming short-tempered before menstruation, while 47.9% did not. This shows a modest increase in irritability-related reactivity during the premenstrual phase. Depressive symptoms were reported by 45.4% of the participants, whereas 54.6% reported no depressive feelings. Thus, mood depression was less frequently observed than other emotional symptoms. Seventy-five-point-six percent of subjects reported normal stress levels, while twenty-four-point-four percent experienced mild stress.

Table 3: Presents the frequency distribution of emotional PMS variables by temperament

Groups	Irritability		Total	Pearson Chi-Square (X2)	Degree of Freedom (df)	p
	No (0)	Yes (1)				
Safrawi	8	51	59	57.97	1	<0.001
Balghami	50	10	60			
Total	58	61	119			
Tension						
Safrawi	11	48	59	33.74	1	<0.001
Balghami	43	17	60			
Total	54	65	119			
Short-tempered						
Safrawi	9	50	59	52.61	2	<0.001
Balghami	48	11	60			
Total			119			
Depression						
Safrawi	13	46	59	50.14	1	<0.001
Balghami	52	8	60			
Total	35	25	119			



4.5 Association between Temperament and Emotional Premenstrual Symptoms



Irritability: Chi-square analysis (χ^2 = 57.97, p< 0.001) revealed a significant association between *Mizaj* and irritability. Safrawi participants showed markedly higher irritability (86.4%) compared to Balghami (16.7%).

Tension: A highly significant relationship was observed between *Mizaj* and tension (χ^2 = 33.74, p< 0.001). 81.4% of Safrawi women reported premenstrual tension, compared to only 28.3% of Balghami women.

Short-Tempered Behavior: The association between *Mizaj* and short-temperedness was significant (χ^2 = 52.61, p< 0.001). 84.7% of Safrawi participants experienced short-temperedness, while only 18.3% of Balghami reported this symptom.

Depression: A significant difference was also found for depression (χ^2 = 50.14, p< 0.001). 78% of Safrawi participants reported premenstrual depressive symptoms, whereas only 13.3% of Balghami participants did.

Stress

Table 4: Shows the distribution of stress among the Mizaj

Mizaj * Stress Crosstabulation				
Count				
		Stress		Total
		Normal	Mild Stress	
Mizaj	Balghami	57	3	60
	Safrawi	33	26	59
Total		90	29	119

Table 5: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	24.635[a]	1	.000		
Continuity Correction[b]	22.561	1	.000		
Likelihood Ratio	27.382	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	24.428	1	.000		
N of Valid Cases	119				

Table 5 shows that the chi-square test (χ^2 = 24.63, p< 0.001) confirmed a significant relationship between *Mizaj* and stress levels. Among Safrawi subjects, 26 (44%) experienced mild stress, while most Balghami subjects (95%) showed normal stress levels. The correlation coefficient (r = 0.455, p< 0.001) indicated a moderate positive relationship between temperament and stress.

Table 6: Symmetric Measures

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Interval by Interval	Pearson's R	.455	.070	5.527	.000[c]
Ordinal by Ordinal	Spearman Correlation	.455	.070	5.527	.000[c]
N of Valid Cases		119			

Table 6 - The Symmetric Measures table presents the strength and direction of the association between Mizaj (temperament) and stress levels using both Pearson's R and Spearman's Rank Correlation. Both coefficients-Pearson's R = 0.455 and Spearman's ρ = 0.455-indicate a moderate positive correlation between the two variables. This means that as the temperament shifts toward Safrawi characteristics, the likelihood of experiencing mild stress increases correspondingly.

The statistical significance values (p< 0.001) confirm that this correlation is highly significant, implying that the observed relationship is unlikely to be due to chance. The approximate t-value of 5.527 further supports the robustness of this association. Overall, these results indicate that temperament has a significant and statistically meaningful influence on stress levels among the study participants.

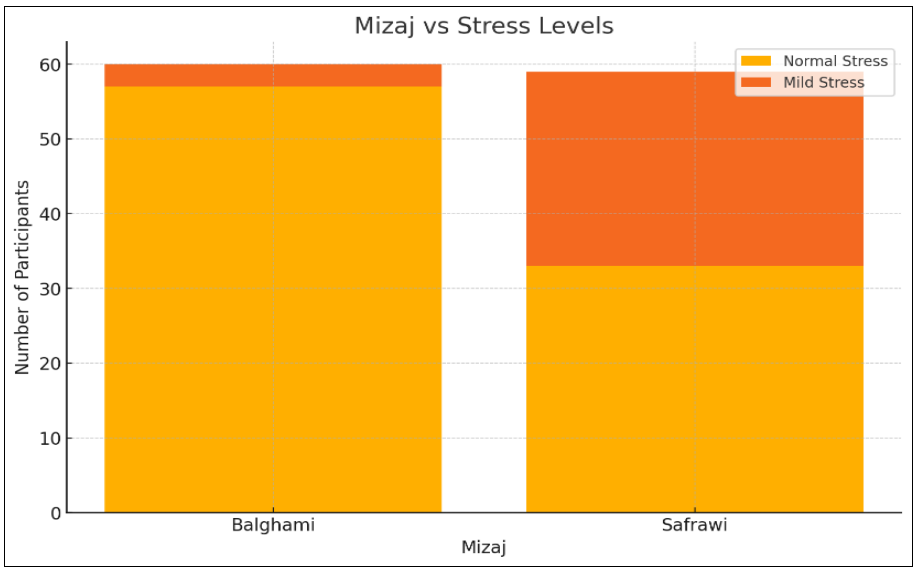


Table 7: Comparison of Present Stress by Temperament

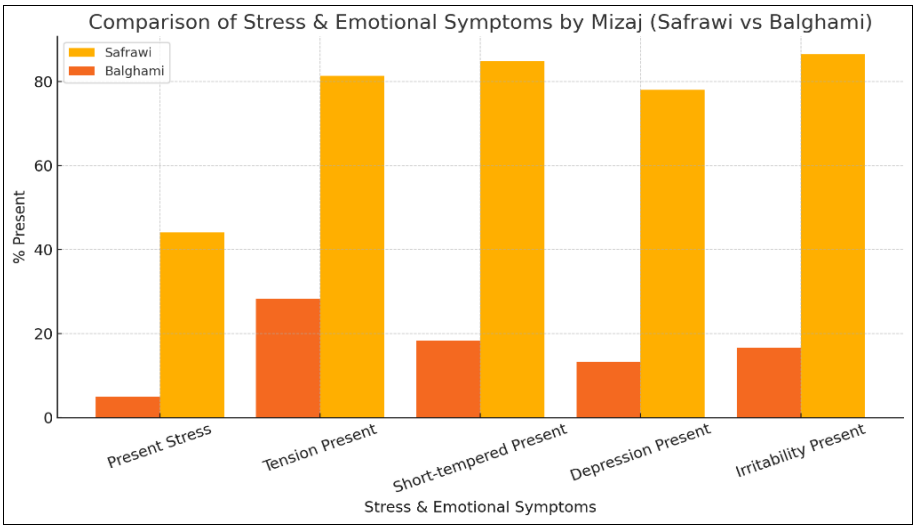
Stress Mean difference by Mizāj							
	Group	N	Mean	Std. Deviation	Std. Error Mean	t	p
Present Stress	Safrawi	59	10.237	1.695	0.221	-10.72	< 0.001
	Balghami	60	7.100	1.492	0.193		

Table 7- The present stress for Safrawi temperament subjects (M = 10.237, SD = 1.695) and for Balghami (M = 7.100, SD = 1.492) indicates that there is a significant difference between the two (t -10.72, p = < 0.001). The level of present stress in the case of Safrawi was higher than that of Balghami.

Correlation Analysis

Table 8: Correlation analyses further supported the significant associations between *Mizaj* and premenstrual emotional symptoms

Emotional Symptom	Pearson's r (Strength of Association)
Tension	0.532 (Moderate Positive)
Short-Temperedness	0.279 (Weak Positive)
Depression	0.649 (Strong Positive)
Irritability	0.698 (Strong Positive)



Positive correlation indicates that Safrawi's temperament exhibits a higher tendency for these emotional symptoms compared to Balghami. Safrawi participants showed a much higher prevalence of all emotional symptoms. Balghami participants mostly remained symptom-absent in tension, stress, depression, and irritability categories. Logistic regression showed temperament as the strongest predictor of emotional PMS symptoms (b = +2.68, p = 0.005). Chi-square results for all symptoms show p< 0.001, strongly confirming that Mizaj and emotional symptoms are not independent - they are significantly associated.

Neuroendocrine Insights: Safrawi women displayed heightened HPA reactivity and cortisol dysregulation, consistent with their vulnerability to stress-induced irritability. Saudawi Temperaments, though not included in this study sample, are classically linked to anxiety and depression due to poor stress tolerance [12, 13].

Discussion

Findings indicate that temperament is a stronger determinant of emotional PMS symptoms than stress alone, though stress acts as an amplifier. This aligns with Unani concepts of Su-e-Mizaj and modern psychoneuroendocrine models, which link stress to mood dysregulation [14, 15].

Safrawi's temperament showed higher mean stress scores, more frequent emotional symptoms: tension, irritability, short-tempered behavior, and depression. Due to the hot, dry nature of Safrawi's temperament, individuals may have higher irritability, greater physiological arousal, and lower stress tolerance. Balghami temperament, being cold and moist, is typically calmer and more stable, which may protect them from stress. Safrawi women were particularly prone to irritability and mood swings, consistent with their hyperactive sympathetic and HPA responses [9].

These results validate the Unani perspective that individual constitution (Mizaj) governs stress reactivity and psychosomatic outcomes. The proposed Neuroendocrine-Temperamental Axis suggests that temperament influences cognitive appraisal, autonomic tone, and cortisol responses, thereby shaping emotional PMS vulnerability [16, 17].

Conclusion

In conclusion, Temperament emerged as a key determinant of PMS-related emotional disturbances and stress, with Safrawi women being significantly more susceptible than Balghami women. The evidence supports both classical Unani concepts and contemporary scientific understanding, indicating that an individual's constitutional makeup governs stress perception and behavioral expression.

Incorporating temperament-oriented evaluation and lifestyle modifications within routine reproductive healthcare may therefore enhance early identification and management strategies for PMS-related distress, ultimately improving women's quality of life.

Conflict of Interest

Not available.

Financial Support

Not available.

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