

The Relationship between Personality Traits and State-Trait Anxiety among Students of Shahid Sadoughi University of Medical Sciences, Yazd

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Abstract

Background: Personality traits, defined as an organized set of relatively stable and enduring characteristics that distinguish one individual from others, can influence anxiety levels.

Objectives: Given the role and importance of personality traits and anxiety among students, the present study aimed to determine the relationship between personality traits and state-trait anxiety in students at Shahid Sadoughi University of Medical Sciences in Yazd City, Iran.

Methods: This study employed a correlational, cross-sectional design. The study population consisted of 389 students selected through proportional stratified sampling from various faculties. Data were collected using two standard questionnaires. To assess participants' personality profiles, the Bass Questionnaire was utilized, which measures dimensions such as fair-mindedness, bravery, and introversion. Anxiety levels were evaluated using the STAI (State-Trait Anxiety Inventory), encompassing both state and trait anxiety subscales. Data analysis was performed using SPSS26, utilizing descriptive statistics (mean and standard deviation). To examine the relationships between personality dimensions and anxiety levels, Spearman's rank correlation coefficient was employed, as the data did not meet the assumptions of normality.

Results: The mean scores for personality traits and state-trait anxiety were 74.67 ± 11.13 and 113.74 ± 11.61 , respectively. A significant correlation was observed only between the overall mean score of personality traits and gender ($P = 0.021$) and marital status ($P = 0.019$). Students' personality traits leaned more towards being conscientious, exhibiting fairness, and a tendency to respect the rights of others. Trait anxiety was more evident than state anxiety among students. Regarding state and trait anxiety, the mean scores indicated moderate to high levels of both manifested and hidden anxiety. In general, a significant negative relationship was observed between state-trait anxiety and personality traits ($r = -0.158$, $P = 0.002$).

Conclusion: Personality traits can play a significant role in the onset and severity of anxiety in students. Therefore, identifying the personality type of each student using personality typing tests, which can determine the appropriate type of counseling for that individual, followed by organizing specialized counseling sessions for vulnerable personality types, is considered an important step.

Keywords: State Anxiety, Trait Anxiety, Personality Trait, Medical Sciences Students

1. Background

Personality traits serve as the foundational framework for an individual's behavioral systems, influencing cognitive processes and decision-making patterns. Variations in these traits lead to diverse behavioral responses in similar situational contexts, significantly impacting emotional regulation and anxiety levels.^{1,2} Specifically, certain personality dimensions, such as neuroticism or emotional instability, can act as critical determinants in how individuals perceive and cope with stressful or anxiety-

provoking stimuli.³

In academic environments, anxiety manifests through complex perceptual, physiological, and behavioral responses. While various forms of anxiety exist, academic-related stress, stemming from examinations, intensive study loads, and practical training, is a prominent factor that can impair academic achievement. Research indicates an inverse relationship between anxiety levels and academic progress; as anxiety increases, cognitive performance and achievement tend to decline.^{4,5} Globally, studies have

highlighted the prevalence of test-related anxiety, particularly among university students.⁶ Furthermore, high levels of anxiety are often associated with maladaptive coping mechanisms, including substance misuse and diminished psychological well-being.^{7,8} In the context of Iran, medical students have been identified as a particularly vulnerable population, frequently exhibiting significantly higher symptoms of stress compared to other student cohorts.^{9,10} In Iran, reports have also noted significant symptoms of stress in medical sciences students, showing that these students in this field are more anxious than others.^{11,12}

2. Objectives

Despite the well-documented impact of stress on academic success, there is a lack of comprehensive research investigating the interplay between specific personality dimensions and both state and trait anxiety within the unique academic environment of medical sciences. Therefore, this study aims to examine the relationship between personality traits and state-trait anxiety among students at Shahid Sadoughi University of Medical Sciences in Yazd, Iran.

3. Methods

3.1. Study Design and Setting

This study employed a correlational, cross-sectional design conducted during the 2023-2024 academic semester.

3.2. Study Participants and Sampling

The statistical population consisted of all undergraduate and graduate students enrolled at the university during the target semester ($N = 4361$). A proportional stratified sampling method was implemented, using academic faculties as strata to ensure representative participation. Based on a calculated sample size of $n = 394$ (considering $\alpha = 0.05$, $\beta = 0.2$, and a correlation coefficient $r = 0.119$),¹³ the final sample was recruited. To minimize confounding variables, individuals with a documented history of psychiatric disorders were excluded from the study via self-report.

$$n_0 = \frac{(Z_{1-\alpha} + Z_{1-\beta})^2}{\mu_p^2} + 3$$

$$n = \frac{n_0}{1 + \{(n_0 - 1)/N\}}$$

$$\mu_p = \frac{1}{2} \ln \frac{1+r}{1-r}$$

3.3. Data Collection Tools

Data were collected using a structured questionnaire comprising three sections:

1) **Demographic Profile:** This section included gender,

age, marital status, academic level, faculty, and history of psychological disorders.

2) **Personality Traits Questionnaire:** Personality was assessed using the Bass Questionnaire. This standardized instrument consists of 27 items measured on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). The reliability of this tool in the Iranian context was previously validated by Faraji et al., demonstrating a test-retest reliability coefficient of 0.80.¹⁴

3) **State-Trait Anxiety Inventory (STAI):** To evaluate anxiety levels, the STAI was employed. This scale comprises 40 items divided into two subscales: the State Anxiety Scale (20 items) and the Trait Anxiety Scale (20 items). The State scale assesses current emotional responses, while the Trait scale evaluates habitual anxiety patterns. Responses are recorded on a 4-point scale (from “very little” to “very much”). The reliability of this instrument was confirmed by Khanipour¹⁵ et al., with a Cronbach’s alpha of 0.92.

Data were collected through in-person administration to ensure high response rates and clarify any potential ambiguities in the questionnaires. To minimize disruptions to the academic schedule, the study was conducted with the prior coordination of the students and faculty. Data collection took place immediately before the commencement of scheduled classes, providing a standardized time frame for all participants and minimizing the impact of external academic stressors on measured anxiety levels.

3.4. Statistical Analysis

Data analysis was performed using IBM SPSS Statistics (Version 26). Descriptive statistics, including means and standard deviations, were used to summarize the data. The normality of the distribution was assessed using the Kolmogorov-Smirnov test. Since the data did not follow a normal distribution, the non-parametric Spearman’s rank correlation coefficient was utilized to examine the relationship between personality traits and anxiety levels.

4. Results

The demographic characteristics of the participants are presented in Table 1. Moreover, the mean age of the students was 23.3 years, with a standard deviation of 3.57.

The descriptive statistics for personality characteristics and the scores for state and trait anxiety are shown in Table 2.

The above table shows that the mean score of Trait anxiety (61.00 ± 6.03) was higher than the mean score of State anxiety (52.73 ± 15.39). The total anxiety score was 113.74 ± 11.61 .

Table 3 then presents the correlation coefficients between the students’ personality characteristics and their state/trait anxiety, along with demographic variables.

Table 1. Demographic Characteristics of the Studied Population

Variables	Category	Frequency	Percentage (%)
Gender	Female	269	69.15
	Male	120	30.85
Education/Professional status	Bachelor's student	145	37.27
	Master's student	38	9.76
	Ph.D. student	6	1.54
	Medical student	164	42.15
	Medical resident	36	9.25
Faculty	Public health	83	21.33
	Medicine	147	37.78
	Paramedical sciences	47	12.08
	Midwifery	17	4.37
	Nursing	40	10.28
	Pharmacy	21	5.39
	Dentistry	34	8.74
Marital status	Single	257	66.06
	Married	126	32.39
	Other	6	1.54

Table 2. Descriptive Statistics for Personality Characteristics and State-Trait Anxiety

Component	Mean ($\pm$ Standard Deviation)
Personality characteristics	74.67 $\pm$ 11.13
Fair-minded	29.92 $\pm$ 4.80
Brave	14.55 $\pm$ 2.88
Equality-oriented	16.31 $\pm$ 3.72
Introverted	13.88 $\pm$ 3.32
Anxiety (Total)	113.74 $\pm$ 11.61
State anxiety	52.73 $\pm$ 15.39
Trait anxiety	61.00 $\pm$ 6.03

Table 3. Correlation between Personality Characteristics and State-Trait Anxiety with Demographic Variables

Variable	Personality characteristics		State-trait anxiety	
	P-value	r	P-value	r
Age	0.432	-0.04	0.368	-0.046
Gender	0.021	-0.117	0.067	0.093
Marital status	0.019	0.119	0.780	-0.014
Faculty	0.324	-0.05	0.406	0.042
Education/Professional status	0.663	-0.022	0.449	0.039

Based on the results presented in the above table, there was a statistically significant negative relationship only between personality characteristics and gender ($P = 0.021$), and a statistically significant relationship between

personality characteristics and marital status ($P = 0.019$).

Subsequently, the correlation coefficients between each dimension of personality characteristics and state-trait anxiety among the students are examined and displayed in Table 4.

Table 4. Correlation Coefficient between Students' Personality Characteristics and State-Trait Anxiety

Component	State anxiety		Trait anxiety	
	P-value	r	P-value	r
Fair-minded	0.000	-0.288	0.000	0.352
Brave	0.328	-0.05	0.067	0.093
Equality-oriented	0.112	-0.081	0.000	0.235
Introverted	0.000	-0.27	0.000	0.221
State-trait anxiety (Total)				
Personality characteristics (Total)	P-value	r		
	0.002	-0.158		

Based on the results presented above, a statistically significant negative association was observed between state anxiety and the fair-minded and introverted personality dimensions. A statistically significant positive association was observed between trait anxiety and the fair-minded, introverted, and equality-oriented personality dimensions. Overall, a statistically significant negative association was observed between total state-trait anxiety

and personality characteristics ($r = -0.158$, $P = 0.002$).

5. Discussion

The results of the study indicated that the mean score for personality characteristics among students at Shahid Sadoughi University of Medical Sciences was generally high. Specifically, the highest mean score was associated with the fair-minded personality dimension, suggesting a

prevalence of characteristics such as fairness and a tendency to respect the rights of others among the majority of students. Conversely, personality traits such as bravery and introversion were identified with lower mean scores in this research. Regarding anxiety, the mean scores indicated moderate to high levels of both state and trait anxiety among the students, with trait anxiety being particularly prominent in the majority of the sample. A particularly noteworthy finding in this study was the divergent relationship between introversion and anxiety dimensions. We observed a significant negative correlation between introversion and state anxiety, yet a positive correlation with trait anxiety. This paradox can be theoretically interpreted through the lens of emotional regulation. It is possible that introverted students, by preferring solitary environments, experience lower levels of acute situational anxiety (state anxiety) during social or classroom interactions. However, their inherent temperament may predispose them to higher baseline levels of enduring anxiety (trait anxiety), potentially due to increased internal cognitive processing or heightened sensitivity to environmental stimuli. This distinction underscores the necessity of differentiating between transient emotional states and stable personality-driven vulnerabilities in student mental health interventions.

Numerous studies have been conducted on the relationship between personality characteristics and anxiety, each addressing the topic from different angles. These studies underscore the importance of understanding the relationship between personality traits and different levels of anxiety in academic and professional settings. While Dargahi and Shaham¹⁶ observed a predominance of meticulous and organized personalities among hospital managers, our study identified a higher inclination toward fair-mindedness among medical students. This discrepancy is not merely a result of different demographic profiles but reflects the distinct psychological demands of each role. Managers operate in high-stakes environments requiring rigid structure and precision to mitigate systemic risks, which fosters "organized" traits. In contrast, the medical student environment—characterized by heavy social interaction, peer learning, and ethical development—may prioritize "fair-mindedness" as a foundational social competence necessary for collaborative learning and future clinical empathy. Nesaian et al.,¹⁷ in their research examining the relationship between occupational stress, personality characteristics, and spiritual experiences, provided significant findings. They found a meaningful relationship between occupational stress and personality characteristics. They found a meaningful relationship between occupational stress and personality characteristics. This finding is consistent with the results of the present study, which indicated a significant relationship between state-trait anxiety and personality characteristics. Research on the link between stress and personality traits suggests that

individuals with varying personality traits have different ways of coping with stress. Research on the link between stress and personality traits indicates that individuals with varying personality traits exhibit different patterns of coping with stress. Similarly, Hasani and Rezaee¹⁸ showed that trait anxiety was higher than state anxiety in secondary school students, a finding consistent with the present study. This consistency may indicate a stable pattern regarding anxiety in educational environments.

Khosravi and Bigdeli¹⁹ found no significant relationship between test anxiety and introversion, which contrasts with the current findings where a significant association was observed between general anxiety and introversion. This discrepancy may stem from the specificity of test anxiety compared to the more generalized nature of the anxiety measured in this study, as well as differences in measurement tools and populations. It is important to note that while introversion scores were lower in our sample, the observed negative association between introversion and anxiety suggests that individuals with higher levels of introversion in this population tend to report lower anxiety levels. Our findings regarding fair-mindedness also contrast with Abdavi and Dehghani,²⁰ who reported lower scores in physical education students. This divergence is likely rooted in the nature of professional socialization inherent to each field. The physical education discipline often emphasizes competitive, extroverted, and dominance-oriented traits essential for athletic performance. Conversely, the medical curriculum demands a high degree of interpersonal fairness and ethical cooperation, which aligns with the higher fair-mindedness scores observed in our sample. Thus, the field of study acts as a selective environment that shapes and highlights specific personality dimensions.

5.1. Limitations

One of the limitations of the present study was the use of a cross-sectional design, which cannot establish causal relationships between personality characteristics and anxiety. Additionally, the research was conducted at only one university, which may limit the results to the specific conditions of this university, reducing their generalizability. Furthermore, the use of self-report questionnaires to measure anxiety and personality characteristics may be subject to response biases and social desirability effects.

6. Conclusion

In conclusion, this study demonstrated significant associations between personality characteristics and anxiety levels among medical students. Specifically, a significant negative association was observed between state anxiety and the fair-minded and introverted dimensions, while a significant positive association was observed between trait anxiety and the fair-minded, introverted, and equality-oriented dimensions. These findings suggest that

personality profiles are closely linked to anxiety patterns in academic settings. Rather than implying that personality changes can directly reduce anxiety, these results highlight the importance of recognizing how different personality dimensions are associated with anxiety vulnerability. Consequently, understanding these associations may facilitate the development of tailored psychological support and stress management strategies that account for the diverse personality profiles of students. Integrating personality assessment into student health services could assist in identifying individuals with higher vulnerability to anxiety, thereby enabling more personalized and targeted counseling interventions.

6.1. Suggestions

- **Tailored psychological interventions:** Instead of one-size-fits-all mental health services, universities should develop specialized counseling programs that align with students' personality profiles. For instance, students exhibiting personality traits associated with higher anxiety vulnerability could be offered targeted Cognitive Behavioral Therapy (CBT) or mindfulness-based interventions specifically designed to address their unique coping mechanisms.
- **Personality-informed skill building:** Rather than general stress management, universities should organize specialized workshops focused on enhancing specific coping skills. For example, students with traits predisposed to anxiety could participate in training sessions focused on emotional regulation, social skills training (for those with higher introversion-related anxiety), or resilience-building exercises.
- **Proactive screening and early identification:** Institutions should implement periodic, non-intrusive psychological screening tools within the student health services. By integrating personality and anxiety assessments into regular health check-ups, faculty can proactively identify "at-risk" students and provide early-stage support before academic performance or mental health significantly declines.
- **Adaptive pedagogical approaches:** To mitigate academic stress, medical curricula could integrate "personality-aware" teaching methodologies. This includes diversifying assessment methods, such as balancing high-stakes individual examinations with collaborative group projects or practical clinical simulations, to accommodate the diverse learning preferences and anxiety profiles (e.g., introverted vs. extroverted) of the student body.

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Author Contributions

HJ: Scientific conception and design, drafting of the article,

final review and approval of the version to be published; MKR: Scientific conception and design, final review and approval of the version to be published; MZ: Scientific conception and design, data acquisition, drafting of the article, final review and approval of the version to be published; EK: Data analysis, final review and approval of the version to be published.

Conflict of Interest Disclosures

All authors declared that they have no conflict of interest.

Ethical Approval

This research approved by the Ethics Committee of Shahid Sadoughi University of Medical Sciences under the approval code IR.SSU.SPH.REC.1402.151.

Research Highlights

What Is Already Known?

- Students with higher levels of anxiety achieve lower scores compared to students under similar conditions but with lower anxiety levels.
- In Iran, reports have also been made observing significant symptoms of stress in medical sciences students, showing that these students in this field are more anxious than others.

What Does This Study Add?

- The students' personality characteristics lean more towards the fair-minded personality, and trait anxiety is more evident in them than state anxiety.
- The more an individual possesses fair-minded and introverted personality traits, the less state anxiety they experience.

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