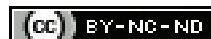


Association of Vedic Personality Traits and Empathy among Medical Students: A Cross-sectional Study

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ABSTRACT

Introduction: Medical students are expected to provide compassionate and empathic care to their patients. Empathy is a crucial component of the doctor-patient relationship. The Triguna theory is a fundamental concept in Hindu philosophy that describes three inherent qualities of nature: Sattva, Rajas, and Tamas. Each individual has a unique combination of these qualities, which shapes their personality and behaviour. However, the relationship between Triguna personality and empathy in medical students has not been explored in depth.

Aim: To examine the association between Triguna personality and empathy in medical students.

Materials and Methods: The present study was a cross-sectional questionnaire-based survey conducted among first-phase medical undergraduates in the Department of Physiology, Rama Medical College Hospital and Research Centre, Kanpur, Uttar Pradesh, India from July 2024 to August 2024. A total of 122 medical students participated in the study. The Vedic Personality Inventory (VPI) was used for assessing personality, and the Brief form of Interpersonal Reactivity Index (B-IRI) was used for assessing empathy. Correlational analysis and an unpaired student's t-test were performed.

Results: There were 122 subjects; the proportion of male and female students was 52 (42.6%) and 70 (57.4%), respectively.

The mean±Standard Deviation (SD) age was 20.43±1.23 years. Sattva score was positively correlated with Perspective-taking (PT) ($r=0.193$, $p<0.05$) and negatively correlated with Personal Distress (PD) scores ($r=-0.322$, $p<0.01$). Tamas scores were positively correlated with Fantasy (FT) ($r=0.251$, $p<0.01$) and PD scores ($r=0.401$, $p<0.01$). Female participants demonstrated significantly higher mean scores as compared to males in Empathic Concern (EC) (16.9±2.681 vs. 14.730±2.951), PT (15.442±2.618 vs. 14.038±2.779), and PD (13.552±2.776 vs. 12.288±3.291) in the present study. There was no significant difference in Sattva, Rajas, and Tamas scores between males and females.

Conclusion: The study explores the association between the VPI traits, such as Sattva, Rajas, and Tamas, and empathy measures. Sattva shows a positive correlation with Perspective Taking (PT) and a negative correlation with PD, indicating that individuals with higher Sattva scores are likely to exhibit better social competence and emotional stability. Additionally, gender differences were observed in empathy scores, with females scoring higher than males in PT, EC, and PD, emphasising the relevance of considering personality traits in medical education to foster empathic skills among healthcare professionals.

Keywords: Education, Fantasy, Personality inventory, Social skills

INTRODUCTION

Empathy is a multidimensional construct that encompasses both cognitive and affective elements, allowing healthcare providers to understand and share the feelings of their patients. In the context of patient care, it is defined as the cognitive ability to comprehend a patient's inner experiences and perspective and the capacity to communicate this understanding [1]. Personality traits play a crucial role in shaping the doctor-patient relationship. Studies have demonstrated that personality traits can affect the stress levels and clinical competence of medical students. Empathy has been found to be associated with factors such as gender, personality characteristics, family environment, early experiences with parents, and social-educational experiences [2,3]. The Gunas theory is a concept that originated from the Sankhya Indian philosophy and describes three basic qualities or attributes of nature, called gunas. The three gunas are sattva, rajas, and tamas. Each guna represents different aspects of human behaviour, and understanding an individual's dominant guna can provide insight into their personality [4]. The Triguna model takes into account both state and trait components, with the latter being relatively constant and accounting for an individual's personality type. The former, on the other hand, is dynamic and involves the formation of a particular combination of different components from the Triguna model, namely sattva, rajas, and tamas. This model provides a comprehensive understanding

of the interplay between environment and personality, allowing for a deeper insight into the complexities of human behaviour [5,6]. Persons with dominant sattva-guna are associated with balance, peace, equanimity, truthfulness, dutifulness, detachment, discipline, and contentment. Persons with dominant rajas-guna are associated with intense activity, dynamic, passion, agitation, anxiety, nervousness, and a materialistic mentality. Persons with dominant tamas-guna are associated with mental imbalance, anger, ignorance, arrogance, and helplessness [4,6]. Davis MH (1983) included cognitive and emotional components in the definition of empathy and said that empathy "can best be considered as a set of constructs, related in that they all concern responsivity to others". The B-IRI derived from the Interpersonal Reactivity Index Test, is a four-subscale item-based instrument quantitatively assessing empathy through PT, PD, EC, and FT subscales [7,8]. The PT scale assesses the tendency to spontaneously adopt the psychological point of view of others; the FT scale delves into their capacity for imaginative empathy towards fictional characters. The other two subscales measure typical emotional reactions of the respondents: EC scale assesses the level of compassion and concern for those facing adversity, and the PD scale provides insight into their personal anxiety and discomfort in challenging social settings [7].

Empathy is a crucial personal attribute that plays a significant role in fostering positive interpersonal relationships. Several studies have

shown a strong relationship between personality characteristics and empathy [9-11]. As such, it was expected that there would be significant correlations between empathy scores and personality measures related to human relationships [2]. Considerable research has been conducted to investigate the western modules of personality. However, there was a need to delve into the indigenous Vedic theory of triguna personality and its relationship with widely accepted concepts such as empathy. In the realm of Indian psychological literature, the guna theory has been subjected to empirical testing and widely accepted. The Guna constructs have been supported by robust psychometric evidence, including reliability and validity, making them compatible with empirical studies influenced by the western style [6]. Little research has been done on the association between triguna personality and empathy among medical students. The present study posed the research question: Is there an association between triguna personality and empathy in medical students? Hypothesis: Medical students with a higher Sattva quality in their triguna personality will demonstrate higher levels of empathy. The present study was conducted with the objective to examine the association between triguna personality and empathy in medical students.

	Sattva	Rajas	Tamas	Fantasy (FT)	Perception Taking (PT)	Empathic Concern (EC)	Personal Distress (PD)	B-IRI
Cronbach's alpha, α	0.754	0.714	0.838	0.804	0.503	0.701	0.585	0.786

[Table/Fig-1]: Cronbach alpha for VPI and Brief form-of Interpersonal Reactivity Index (B-IRI).

MATERIALS AND METHODS

This cross-sectional questionnaire-based was conducted in the Department of Physiology, Rama Medical College Hospital and Research Centre, Kanpur, Uttar Pradesh, India from July 2024 to August 2024. Approval from the Institutional Ethics Committee (RMCHRC/Ethics/2023/2686-A) was taken before the initiation of the study. Participants were well informed about the study's objectives. Participants in the online survey provided consent by clicking the "yes" option and completing the questionnaire, as there was no physical informed consent form.

Inclusion criteria: Study participants included first-phase medical undergraduates above 18 years of age.

Exclusion criteria: Participants with any history of psychiatric disorders were excluded from the study.

Sample size calculation: Assuming a low correlation of 0.3 and to test the hypothesis other than null, alpha at 5%, power of 0.9. A sample of 112 subjects was required. The sample size was calculated using G Power 3.1 [12]. However, the authors invited the entire eligible first-phase medical undergraduates to participate in the present study. Out of a batch of 150 students, 122 participated and completed the questionnaire.

Study Procedure

The VPI is a self-report questionnaire that measures an individual's personality in terms of the three trigunas. The B-IRI is a self-report questionnaire that measures an individual's empathy in terms of PT, FT, EC, and PD.

Vedic Personality Inventory (VPI): This inventory has 56 items to assess the Vedic concept of personality. It gives a standardised score for each guna. It includes 15 Sattva items, 19 Rajas items, and 22 Tamas items. Participants were required to indicate their level of agreement towards the given items using a 7-point scale that encompassed responses from very strongly disagree (1) to very strongly agree (7). The percentage of guna scores was calculated by dividing the sum of all responses for a guna by the total possible score for that guna, and the score was then converted into a percentage. To obtain the standardised score of a guna, the sum of the percentage scores of all three gunas is divided by each guna score [6,13].

Cronbach's alpha (α) for the three subscales ranged from 0.93 to 0.94, and the corrected item-total correlation of every item score with its subscale score was greater than 0.50 [6]. Since a few items were removed from the scale, the authors think these items were not appropriate for the population studied. Therefore, the VPI consisted of 47 items, including 14 Sattva items, 15 Rajas items, and 18 Tamas items. In the present study, α values for Sattva, Rajas, and Tamas were 0.754, 0.714, and 0.838, respectively.

Brief Form-interpersonal Reactivity Index (B-IRI): This is a 16-item instrument consisting of four subscales (FT, EC, PT, and PD). The subscales showed reasonable reliability and validity. Participants were required to read 16 statements and indicate how well the statements described him or her on a scale of 0-4. Scores were reported for each subscale and ranged from 0 to 16 [8].

Cronbach's alpha (α) of 0.79 to 0.82, 0.68, 0.68 to 0.69, and 0.71 to 0.72 for FT, EC, PT, and PD, respectively, has been reported for this instrument [8]. In the present study, α values for perception taking, EC, PD, FT, and overall B-IRI were 0.503, 0.701, 0.585, 0.804, and 0.786, respectively [Table/Fig-1].

To recruit participants, a link to a Google form was shared. Those willing to participate simply clicked the "yes" option and were directed to the questionnaire. If they chose not to participate, the link was terminated. The principal and co-investigator assessed completed questionnaires.

STATISTICAL ANALYSIS

The data were analysed using International Business Machines (IBM) Statistical Package for the Social Sciences (SPSS) version 26.0. Data were coded and entered into Microsoft excel. After ensuring that all assumptions for correlational analysis between VPI and B-IRI were met, the Pearson's correlation coefficient test was used. Based on the normal distribution of data and homogeneity of variance, an unpaired Student's t-test was used to analyse any differences in VPI and B-IRI scores based on gender. A p-value of <0.05 was considered significant.

RESULTS

Demographic characteristics: There were 122 subjects; the proportion of male and female students was 52 (42.6%) and 70 (57.4%), respectively. The mean (\pm SD) age was 20.43 \pm 1.23 years. No statistical difference was found between the mean age for men (20.31 \pm 1.17) years and women (20.58 \pm 1.30) years. The demographic characteristics of the participants is shown in [Table/Fig-2].

Variables		Frequency
Gender	Male	52 (42.6%)
	Female	70 (57.4%)
Family Residence	Village	13 (10.7%)
	Town	35 (28.7%)
	Non metropolitan city	54 (44.3%)
Choice of career	Metropolitan city	20 (16.4%)
	Parent	11 (9%)
	Self-chosen	111 (91%)
Extracurricular activity	No	33 (27%)
	Yes	89 (73%)

[Table/Fig-2]: Frequencies for demographic characteristics.

Assumption testing: VPI subscale scores and B-IRI subscale scores were assessed for normality testing. The normality tests

for the VPI and B-IRI subscales is shown in [Table/Fig-3]. For correlational analysis, data followed a normal distribution as assessed by skewness, kurtosis, and the Z test [14].

Subscales	Skewness	Z _{Skewness}	Kurtosis	Z _{Kurtosis}
Sattva	0.103	0.470	-0.227	-0.522
Rajas	-0.320	-1.46	-0.308	-0.708
Tamas	-0.334	-1.53	-0.218	-0.501
Fantasy (FT)	-0.627	-2.86	0.194	0.446
Empathic Concern (EC)	-0.601	-2.74	-0.016	-0.037
Perspective Taking (PT)	0.0701	0.320	-0.748	-1.719
Personal Distress (PD)	0.006	0.027	-0.105	-0.241

[Table/Fig-3]: Normality tests for VPI and Brief form of Interpersonal Reactivity Index (B-IRI).
SE_{Skewness} -0.219
SE_{Kurtosis} -0.435
SE: Standard error

There were a few outliers present in the data, as assessed by inspection of the boxplot and Z score. They were replaced with 5th or 95th percentile values and included in the analysis.

Correlation analysis: [Table/Fig-4] shows the Pearson product-moment correlation among the VPI and B-IRI subscales. As with

VPI, sattva was found to be negatively correlated with both rajas ($r=-0.409$, $p<0.01$) and tamas ($r=-0.585$, $p<0.01$), while tamas and rajas were positively correlated ($r=0.733$, $p<0.01$). Sattva was negatively correlated with PD ($r=-0.322$, $p<0.01$) and positively correlated with PT ($r=0.193$, $p<0.05$). In contrast, both rajas and tamas were positively correlated with FT and PD ($p<0.01$).

The normality testing for VPI subscale scores and B-IRI subscales at the gender level is shown in [Table/Fig-5]. There were no outliers, as assessed by an inspection of a boxplot. For the independent t-test, data followed a normal distribution as assessed by skewness, kurtosis, and the Z test. Homogeneity of variances was non significant as assessed by Levene's test for equality of variances.

Comparison analysis: The results of the independent t-test to see if there were any differences in VPI and B-IRI scores based on gender is shown in [Table/Fig-6]. There was no significant difference in sattva, rajas, and tamas between males and females. EC, PT, and PD scores were higher in females than males, indicating a statistically significant difference.

DISCUSSION

The present study indicates that sattva has a significant positive and negative correlation with perception-taking and PD, respectively.

Subscales	Sattva	Rajas	Tamas	Fantasy (FT)	Empathic Concern (EC)	Perspective Taking (PT)	Personal Distress (PD)
Sattva	1	-0.409**	-0.585**	-0.119	-0.011	0.193*	-0.322**
Rajas	-0.409**	1	0.733**	0.378**	0.112	-0.098	0.467**
Tamas	0.585**	0.733**	1	0.251**	0.090	-0.094	0.401**
Mean	5.096	4.225	3.541	14.696	15.975	14.844	13.024
SD	0.648	0.701	0.866	3.835	2.988	2.766	3.145

[Table/Fig-4]: Pearson's product-moment correlation among VPI and Brief form of Interpersonal Reactivity Index (B-IRI) subscales.
**Correlation is significant at the 0.01 level (2-tailed), *Correlation is significant at the 0.05 level (2-tailed)

Subscales		Skewness	SE _{Skewness}	Z _{Skewness}	Kurtosis	SE _{kurtosis}	Z _{Kurtosis}
	Gender						
Sattva	Female	0.102	0.287	0.355	-0.372	0.566	-0.6572
	Male	0.096	0.330	0.291	0.045	0.650	0.0692
Rajas	Female	-0.404	0.287	-1.407	-0.242	0.566	-0.4276
	Male	-0.219	0.330	-0.664	-0.273	0.650	-0.4200
Tamas	Female	-0.309	0.287	-1.077	-0.261	0.566	-0.4611
	Male	-0.141	0.330	-0.427	-0.560	0.650	-0.8615
Fantasy (FT)	Female	-0.581	0.287	-2.024	-0.008	0.566	-0.0141
	Male	-0.527	0.330	-1.597	0.060	0.650	0.0923
Empathic Concern (EC)	Female	-0.758	0.287	-2.641	0.207	0.566	0.3657
	Male	-0.478	0.330	-1.448	0.001	0.650	0.0015
Perspective Taking (PT)	Female	0.62	0.287	2.160	-1.062	0.566	-1.8763
	Male	0.21	0.330	0.636	-0.418	0.650	-0.6431
Personal Distress (PD)	Female	-0.175	0.287	-0.609	-0.379	0.566	-0.6696
	Male	0.249	0.330	0.754	0.069	0.650	0.1062

[Table/Fig-5]: Normality tests of VPI and Brief form of Interpersonal Reactivity Index (B-IRI) subscales at the level of gender.

Subscales	Mean (±SD)		t	95% CI	
	Males (n=52)	Females (n=70)		Lower	Upper
Sattva	5.090±0.591	5.101±0.691	0.089	-0.225	0.246
Rajas	4.184±0.684	4.257±0.717	0.566	-0.182	0.328
Tamas	3.493±0.856	3.592±0.845	0.638	-0.208	0.407
Fantasy (FT)	14.711±3.549	14.728±3.959	0.025	-1.357	1.391
Empathic Concern (EC)	14.730±2.951	16.9±2.681	4.232**	1.154	3.184
Perspective Taking (PT)	14.038±2.779	15.442±2.618	2.854**	0.429	2.378
Personal Distress (PD)	12.288±3.291	13.552±2.776	2.297**	0.174	2.354

[Table/Fig-6]: Differences in VPI and Brief form of Interpersonal Reactivity Index (B-IRI) subscales scores between males and females.
**p<0.001

Rajas and tamas had a moderate positive association with FT and PD. Sattva was negatively correlated with rajas and tamas, while rajas were positively correlated with tamas. Females scored higher than males in empathy. In the present study, a positive association between sattva and PT was expected since they share attributes related to social competence, for example, better social functioning and higher self-esteem [4-6]. Khanna P et al., found a positive association between sattva and big-five positive personality traits (extraversion, agreeableness, conscientiousness, openness to experience), thereby providing insights into the holistic Indian approach to personality and its relationship with the Western concept of personality traits [15]. Studies by Betkowska-Korpala B et al., Yasien S and Almuzaini F and Song Y et al., lend partial support to the findings, revealing associations between Big Five personality traits like agreeableness, openness to experience, and extraversion with PT [16-18]. Similarly, Melchers MC et al., studied the relationship between Big Five personality traits and empathy using the interpersonal reactivity index in samples from China, Germany, Spain, and the United States, and found that agreeableness and conscientiousness were the most important predictors of cognitive empathy [19]. Melchers MC et al., Yasien S and Almuzaini F and Betkowska-Korpala B et al., found that the Big Five negative personality trait (neuroticism) was significantly associated with PD [16,17,19]. Khanna P et al., found a negative correlation between the Vedic personality trait sattva and neuroticism [15]. The present study also showed that there was a negative correlation between sattva and the PD subscale. A study by Shi M and Du T and Abe K et al., in medical students showed that Emotional Intelligence (EI) was negatively associated with PD and neuroticism [11,20]. Individuals with high sattva scores may also possess EI, greater attention, self-awareness, and social intuition, thus enabling them to handle distressing situations without experiencing PD [5,15].

In the present study, rajas and tamas had a moderate positive association with PD. Khanna P et al., found that rajas and tamas were negatively correlated with emotional, social, psychological well-being indicators and neuroticism [15]. Individuals with higher scores in rajas and tamas may have difficulties in regulating their own emotions, making them more sensitive to the emotions of others and more likely to experience PD [5,20].

The current study did not find any association among sattva, EC, and FT scores. One possibility is that sattva and EC measure fundamentally different constructs. Davis MH (1983) reported that EC scores were positively associated with some shyness and anxiety but negatively related to boastfulness and egotism. EC was also related to slight emotional vulnerability, chronic fearfulness, and insecurity and to a non selfish concern for other people. Sattva is associated with positive emotions, including non fearfulness, no social anxiety, and concern toward others, and does not strongly correlate with the specific aspect of empathy assessed by the EC subscale [6,7].

As expected, sattva was negatively correlated with rajas and tamas, while rajas was positively correlated with tamas, consistent with findings by Khanna P et al., and Wolf DB [6,15]. Khanna P et al., found that tamas was negatively correlated with sattva and positively correlated with rajas across two samples [15]. Wolf DB investigated correlations between the three gunas and found that sattva and tamas had a very strong inverse relationship [6]. The present study did not find any gender differences in VPI subscale scores, which is in contrast to Khanna P et al., findings, which indicated higher rajas scores among males [15].

Significant gender differences were observed in perception-taking, EC, and PD scores, with females scoring higher than males. This aligns with findings from Shi M and Du T and Toto RL et al., where females scored significantly higher than males [20,21]. However,

studies by Lee BK et al., and Williams B and Sadasivan S KA did not find gender differences in empathy levels [22,23]. Self DJ et al., and Hoffman ML postulated that differences between males and females probably do exist with respect to their affective responses to others' experiences; women are more care-oriented, and in order to care, one must understand and relate to others [24,25].

A study conducted on Italian medical students highlights the importance of considering personality traits in medical education to enhance and sustain empathy in students [26]. Few studies demonstrate that yoga and meditation practice could enhance sattva across age groups and among various professionals, resulting in improving their well-being [27,28]. Future studies can incorporate the above intervention to see the changes in personality and empathy.

Limitation(s)

The present study was a step ahead towards integrating the holistic Indian approach to personality with empathy measures. However, the present study had certain limitations. There was a gender imbalance in the study population, with more male students needed for better representation. The study is cross-sectional and does not provide a longitudinal follow-up, limiting its ability to capture the growth and changes in personality and empathy scores over time. The Vedic personality and empathy scores were derived from self-reported measures, which may introduce response bias and limit the accuracy of the findings.

CONCLUSION(S)

The present study delves into the correlation between various domains of empathy and Vedic personality traits among medical students. Specifically, it was observed that sattva exhibited a positive association with PT, while displaying a negative association with PD. On the other hand, rajas and tamas demonstrated a positive association with FT and PD. The study highlights the importance of incorporating personality assessments and interventions into the curriculum of undergraduate medical education programs with the aim of fostering empathic skills and attitudes among future healthcare professionals.

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