Original Article

Personality Traits as Potential Predictors of Psychological Well-Being among Undergraduate Medical Students: A Cross-Sectional Study

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Abstract

Background: Psychological well-being (PWB) is a multidimensional construct that may be influenced by individual differences in personality. However, relatively little is known about how the Big Five personality traits (PTs) relate to the distinct dimensions of PWB among medical students. The aim is to examine the associations of the Big Five PTs with global and dimension-specific PWB, and to determine their incremental and unique contributions beyond sociodemographic characteristics. **Material and Methods:** A cross-sectional study, was conducted among 100 undergraduate medical students. The Big Five PTs were assessed using the 50-item International Personality Item Pool (50-IPIP), and PWB was assessed using 42-item Ryff's (42-Ryff) multidimensional framework, comprising six dimensions: self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, and personal growth. The participants also filled a sociodemographic proforma. Data were analysed using Pearson's correlation and two-step hierarchical multiple linear regression to determine the incremental contribution of personality beyond sociodemographic characteristics and the unique associations of individual traits with global and dimension-specific PWB. **Results:** Female students scored significantly higher ($P<0.01$) than male students on agreeableness and positive relations with others. PTs accounted for a significant increment in variance across all six dimensions ($\Delta R^2 = 0.317–0.503$, all $P < 0.001$), though the dominant predictor differed by dimension: conscientiousness for environmental mastery ($\beta = 0.471$) and purpose in life ($\beta = 0.344$), agreeableness for positive relations with others ($\beta = 0.505$), openness to experience for autonomy ($\beta = 0.340$), and neuroticism for personal growth ($\beta = -0.331$), and self-acceptance ($\beta = -0.375$). Conscientiousness showed no association with personal growth and positive relations. For the total score, sociodemographic variables accounted for 3.2% of variance, rising to 67.7% with addition of PTs ($\Delta R^2 = 0.645$; F change $(5, 92) = 36.70$, $P < 0.001$) neuroticism being the strongest unique correlate ($\beta = −0.407$). **Conclusion:** Personality is meaningfully associated with PWB among medical students, with distinct traits showing different patterns of association across PWB dimensions. The broad association of neuroticism and the more selective associations of the other traits highlight the value of examining PWB multidimensionally rather than solely as a global construct. These findings may inform approaches to supporting medical student well-being that consider individual differences in personality alongside specific domains of psychological functioning.

Keywords: Big Five, medical students, personality traits, psychological well-being, Ryff scales.

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Introduction

Recent years have witnessed a growing prevalence of mental health problems among medical students globally.[1] The rigorous academic, clinical and emotional demands of medical training contribute to higher levels of anxiety, depression, burnout and substance use compared with age-matched peers in other professional courses.[2,3] Although these demands are largely shaped by the training environment, students vary in their responses to them. Difficulties adapting to the medical curriculum, sustained workload and academic stressors,[4] inadequate use of social resources,[5] and lower self-efficacy,[6] have been identified as contributors to psychological distress. However, the characteristics underlying positive psychological well-being (PWB) may differ from those associated with psychological distress and behavioral problems. Examining PWB therefore provides a complementary perspective on student mental health and may help identify attributes that support positive functioning, beyond the traditional focus on disease and dysfunction.[7]

PWB is a multidimensional construct encompassing positive psychological functioning across multiple domains. Ryff's eudaimonia model conceptualizes PWB across six dimensions — autonomy, environmental mastery, personal growth, positive relations with others, purpose in life and self-acceptance.[5,8] These dimensions capture distinct aspects of psychological functioning that may be differentially affected by the demands of medical training. Thus, students with similar overall PWB may

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nevertheless differ in the specific domains in which they function well or experience difficulties. Considering both global PWB and its specific dimensions may therefore provide a more nuanced understanding of students' psychological functioning than relying on a composite score alone.

Personality traits (PTs) have been suggested as individual characteristics associated with PWB.[9] PTs refer to relatively stable patterns of thinking, feeling and behaving across diverse situations and over the course of life.[10] The five-factor model conceptualizes personality across five broad traits- extraversion, agreeableness, conscientiousness, neuroticism and openness to experience.[11,12] Although preliminary evidence suggests associations between Big five PTs and PWB, prior studies have largely examined composite measures of PWB.[13-15] Research based on Ryff's multidimensional framework, however, suggests that PTs may be differentially associated with specific domains.[16] For example, meta-analytic study indicates that neuroticism is associated with lower well-being, whereas conscientiousness, agreeableness and extraversion are associated with higher well-being.[13] Among medical students, existing research has similarly linked neuroticism with poorer psychological functioning and showed variable associations of other traits across dimensions of PWB.[17] In studies among Indian medical students, personality has been examined primarily in relation to psychological distress rather than positive psychological functioning,[18] while studies of PWB have focused on sociodemographic characteristics and stressors without considering personality.[19] Moreover, limited evidence is available on the unique contributions of individual PTs to PWB after accounting for sociodemographic characteristics and overlap among the Big Five traits.

The objectives of the present study were to: (i) examine the bivariate associations between the Big Five personality traits and overall and dimension-specific PWB; (ii) determine the incremental contribution of the Big Five PTs to PWB beyond sociodemographic characteristics using hierarchical multiple regression (HMR); and (iii) identify the unique associations of individual PTs with overall PWB and each of its six dimensions among undergraduate medical students.

Materials and Methods

Study design and setting: This cross-sectional study was conducted in the Department of Physiology of a government medical college in North India after obtaining approval of the Institutional Ethics Committee. The purpose of the study was fully explained to all willing participants and written informed consent was obtained prior to enrolment.

Sample size: The sample size was determined using a priori power analysis through G*Power 3.1 software,[20] for a hierarchical multiple linear regression. The power analysis was computed for increment in R^2 using two sets of predictors. A medium effect size (f2=0.15) with alpha level of 0.05, and 80% statistical power were assumed. Using these criteria a minimum sample of 92 was calculated. Allowing for a 10% attrition rate, the final sample size was set to 100 medical students.

Participants: All undergraduate medical students enrolled in MBBS programme in the institute were invited to participate voluntarily through flyers and notices displayed within the institute. A total of 125 students responded, 11 were excluded based on exclusion criteria; 14 students returned incompletely filled forms and they were also excluded. Final sample consisted of 100 participants. The identity of each participant was kept anonymous by allocating a random number to each individual, and strict confidentiality was maintained throughout.

Inclusion criteria

Undergraduate medical students of both genders in the age group of 18–25 years of age were included in the study.

Exclusion criteria

Those diagnosed with psychiatric illness or on use of prescribed medication for a psychiatric disorder.

Data collection: Data were collected during February and March 2024 using self-reported, validated questionnaires in English, administered through an online form during breaks in the teaching schedule or after the completion of lectures. Participants first completed a structured proforma recording sociodemographic details (age, gender, monthly family income and type of family) and history of psychiatric illness or medication, followed by the two study instruments. All questionnaires were submitted on the same day and required approximately 30 minutes to complete. Participation was voluntary and did not affect their academic progression.

Measures: Personality trait. Personality was assessed using the 50-item Big Five Factor Markers of Goldberg's International Personality Item Pool (IPIP-50), a public-domain instrument with high validity and reliability. It includes 10 items each for measuring five personality traits: Extraversion, Agreeableness, Conscientiousness, Emotional Stability and Openness to Experience.[11,12] Items are rated on a five-point Likert scale (1 = very inaccurate to 5 = very accurate). Negatively keyed items were reverse-scored and the 10 item scores summed for each trait, yielding domain scores ranging from 10 to 50, with higher scores indicating stronger expression of the trait.[11]

Psychological well-being: Well-being was assessed using the 42-item version of the Ryff Scales (Ryff-42) of Psychological Well-Being (PWB), comprising six subscales: Autonomy, Environmental Mastery, Personal Growth, Positive Relations with Others, Purpose in Life and Self-Acceptance.[5] There are 7 items for each subscale, rated on a six-point Likert scale (1 = strongly disagree to 6 = strongly agree). Negatively worded items were reverse-scored prior to summation so that higher scores indicated greater well-being. Subscale scores for each dimension of wellbeing range from 7 to 42 and total well-being score from 42 to 252.

Statistical analysis: Data were analysed using IBM SPSS version 25 (SPSS, Inc., Chicago, Illinois, USA). The normality of data was assessed based on skewness and kurtosis values. Continuous variables were presented as mean ± SD and categorical variables as frequencies and percentages. Internal consistency for scales was assessed using Cronbach's alpha.

Associations between personality traits and dimensions of well-being were examined using Pearson's correlation. As 30 trait-by-dimension comparisons were performed, a Bonferroni-corrected threshold of $P < 0.0017$ was applied alongside conventional

significance levels. Spearman's rank correlation was used for age, owing to its restricted range. Group differences by gender and family income were examined using independent-samples t-tests, with Levene's test used to assess homogeneity of variance and Cohen's d as the effect size measure.

The observed associations were further examined using hierarchical multiple regression (HMR) to determine the independent and incremental contribution of PTs to PWB. Two-step hierarchical multiple regression analysis determined the incremental variance in PWB explained by personality over and above sociodemographic variables. In step 1, gender and monthly family income were entered (Model 1). In step 2, the five personality traits were entered in addition to step 1 variables (Model 2). Age and type of family were not entered as predictors, as age showed minimal variability (88 of 100 participants were aged 19 or 20 years) and only six participants belonged to joint families. Separate models were constructed for total PWB score to establish overall association and separately for each subscale of PWB to determine whether trait predicted the dimensions differentially. Violations of assumptions of multicollinearity, normality, linearity and homoscedasticity were ruled out.

As categorical variables cannot be entered directly into multiple regression analysis, they were converted into dummy variables (gender: 1 = female, 2 = male; family income: 1 = ₹51,000–1,00,000, 2 = exceeding ₹1,00,000). There were no theoretical or statistical reason for us to choose this labelling for sub-groups of a categorical variable and coding it as vice-versa would have made no difference in the results.

A P value below 0.05 was considered statistically significant for all analyses.

Results

Participant characteristics: The mean age of participants was 19.69 ± 0.81 years (male: female = 64:36). Out of total participants, monthly family income of eighty-six (86%) exceeded ₹1 lakh and of 14 (14%) was between ₹51,000 and ₹1 lakh.

Personality traits and Psychological well-being

Descriptive statistics

Overall Scores: The reliability coefficients for the IPIP-50 and Ryff-42 with the mean ± SD scores for PT and PWB among all participants are presented in Table 1. Reliability coefficients of both full IPIP-50 and Ryff-42 were good (Cronbach's alpha = 0.825 and 0.868 respectively). Reliability coefficients of subscales of IPIP-50 ranged from 0.635 (conscientiousness) to 0.758 (neuroticism), while of Ryff-42 ranged from 0.485 (personal growth) to 0.766 (self-acceptance).

Among PTs, agreeableness had the highest mean score (36.04 ± 5.78), whereas extraversion had the lowest mean score (28.50 ± 6.57). For PWB, the highest mean score was observed for purpose in life (28.85 ± 4.77), while environmental mastery showed the lowest mean score (25.31 ± 4.91) [Table 1].

Scores by Gender: The mean ± SD scores for PTs and PWB among male and female participants are presented in [Table 2]. Female participants scored significantly higher than male participants on agreeableness (p=0.001) and positive relations with others (p = 0.009). No significant gender differences were observed in the mean Ryff-42 total score, any of its remaining five subscale scores, or the remaining four IPIP-50 subscale scores.

Scores by Monthly family income: The mean ± SD scores for PTs and PWB according to participants monthly family income are presented in [Table 3]. Participants from higher-income families scored significantly higher on openness to experience (p= 0.017), whereas no significant differences were observed for the remaining PTs. No significant differences were found in the overall PWB score or any of its dimensions across monthly family-income groups.

Correlation Analysis: The bivariate Pearson correlation matrix for PTs and PWB is presented in [Table 4]. All PTs except extraversion were significantly associated with overall PWB. Among these, agreeableness showed the strongest positive bivariate association ($r = 0.601$, $p<0.001$), whereas neuroticism showed the strongest negative correlation ($r = -0.599$, $p<0.001$) with overall PWB.

Personality traits also demonstrated differential associations with the six dimensions of PWB. Neuroticism showed significant ($p<0.01$) inverse association with all six dimensions of PWB, with the strongest association observed for self-acceptance ($r = -0.527$, $p<0.001$). In contrast, extraversion, agreeableness, conscientiousness and openness to experience showed dimension-specific positive associations [Table 4].

Hierarchical regression analysis

Hierarchical regression analysis examined the incremental contribution of PTs to PWB after accounting for sociodemographic variables.

Demographic predictors of psychological well-being

Model 1, which included gender and monthly family income, did not significantly predict total PWB ($R^2 = 0.032$, $F(2,97) = 1.599$, $p = 0.207$). Gender was not a significant predictor in this model ($\beta = -0.142$, $t = -1.421$, $p = 0.159$) but became a significant predictor after PTs were entered in Model 2, with female students showing higher adjusted PWB scores ($\beta = -0.157$, $t = -2.335$, $p = 0.022$). However, gender was not a significant predictor of any of the six PWB dimensions. Monthly family income was not a significant predictor of total PWB in either model (Model 2: $\beta = 0.065$, $t = 1.058$, $p = 0.293$).

Personality traits as predictor of overall psychological well-being

The results of regression statistics are presented in [Table 5 and 6]. In the model predicting overall PWB, sociodemographic variables entered in Model 1 explained 3.2% of variance, although the model was not statistically significant ($R^2 = 0.032$; $\Delta F (2,97)= 1.60$, $p=0.207$). In Model 2, the addition of PTs explained an additional 64.5% of the variance, with the final model explaining 67.7% of the variance in overall PWB; $\Delta F (5, 92) = 36.70$, $p < 0.001$ [Table 5]. Neuroticism, conscientiousness and agreeableness were significant independent predictors, with neuroticism emerging as the strongest predictor of overall PWB ($\beta = -0.407$, $p < 0.001$). Extraversion and openness to experience were not significant predictors [Table 6].

Personality traits as predictor of dimensions of psychological well-being

Separate hierarchical regression analyses were conducted to examine the independent contribution of PTs to each of the six dimensions of PWB. The addition of PTs significantly increased (all $p < 0.001$) the variance explained across all six dimensions, with ΔR^2 values ranging from 0.317 (personal growth) to 0.503 (self-acceptance) [Table 5]. Predictor patterns differed across dimensions, as detailed below.

Autonomy: Openness to experience ($\beta = 0.340$, $P = 0.003$) and neuroticism ($\beta = -0.310$, $P = 0.003$) were significant independent predictors, while remaining traits were not significant predictors [Table 6].

Environmental mastery: Environmental mastery was predicted principally by conscientiousness ($\beta = 0.471$, $p < 0.001$) and neuroticism ($\beta = -0.297$, $p = 0.001$) [Table 6].

Personal Growth: Neuroticism ($\beta = -0.331$, $p = 0.001$) and agreeableness ($\beta = 0.297$, $p = 0.010$) emerged as significant independent predictors [Table 6].

Positive Relations: Agreeableness ($\beta = 0.505$, $p < 0.001$) and extraversion ($\beta = 0.249$, $p = 0.003$) emerged as significant independent predictors [Table 6].

Purpose in Life: Conscientiousness ($\beta = 0.344$, $p = 0.001$) and neuroticism ($\beta = -0.276$; $p = 0.007$) were significant independent predictors [Table 6].

Self-Acceptance: Self-acceptance was the only dimension for which four personality traits made statistically significant independent contributions. Neuroticism was the strongest predictor ($\beta = -0.375$, $p< 0.001$), followed by agreeableness ($\beta = 0.206$, $P = 0.034$), conscientiousness ($\beta = 0.203$, $p = 0.016$) and extraversion ($\beta = 0.193$, $p = 0.015$) [Table 6].

Table 1: Mean ± SD and reliability (Cronbach's alpha coefficient) of Big five personality test (IPIP-50) and Ryff scale of psychological well-being (42-item)

Scale	Mean±SD	Observed range	Cronbach's alpha
Autonomy	26.58±5.34	14–40	0.590
Environmental Mastery	25.31±4.91	10–40	0.606
Personal Growth	28.41±4.81	14–40	0.485
Positive Relations with Others	27.39±5.94	11–41	0.682
Purpose in Life	28.85±4.77	18–41	0.517
Self-Acceptance	26.96±6.41	10–42	0.766
Total Ryff's PWB score	163.50±22.97	101–220	0.868
Extraversion	28.50±6.57	13–43	0.732
Agreeableness	36.04±5.78	24–50	0.727
Conscientiousness	30.71±5.46	17–45	0.635
Neuroticism	30.22±6.32	14–47	0.758
Openness to Experience	33.53±5.27	19–44	0.665
IPIP-50 scale	---	---	0.825

SD: Standard deviation. PWB = Psychological well-being. Number of participants 100. IPIP-50 total score not calculated as total score is not used for interpretation of personality traits.

Table 2: Gender differences in Big five personality traits and dimensions of Ryff scale of PWB.

Personality trait or dimension of PWB	Female (n=36), mean±SD	Male (n=64), mean±SD	P
Extraversion	28.50±6.24	28.50±6.80	1.000
Agreeableness	38.58±5.32	34.61±5.57	0.001**
Conscientiousness	29.83±5.10	31.20±5.64	0.231
Neuroticism	31.78±7.21	29.34±5.63	0.064
Openness to Experience	33.78±5.71	33.39±5.04	0.726
Autonomy	26.81±6.46	26.45±4.65	0.774
Environmental Mastery	25.64±4.85	25.12±4.96	0.618
Personal Growth	29.06±4.93	28.05±4.75	0.317
Positive Relations with Others	29.44±6.12	26.23±5.56	0.009**
Purpose in Life	28.67±4.56	28.95±4.92	0.775
Self-Acceptance	28.22±6.63	26.25±6.22	0.140
Total psychological well-being score	167.83±25.45	161.06±21.27	0.158

Number of participants 100. SD: Standard deviation, PWB: Psychological well-being; **P<0.01

Table 3: Family income differences in Big Five personality traits and dimensions of Ryff scale of PWB

Personality trait or dimension of PWB	> ₹1,00,000 (n=86), mean±SD	₹51,000–1,00,000 (n=14), mean±SD	P
Extraversion	28.65±6.48	27.57±7.31	0.571
Agreeableness	36.21±5.86	35.00±5.36	0.471
Conscientiousness	30.66±5.67	31.00±4.10	0.832
Neuroticism	30.29±6.16	29.79±7.44	0.783
Openness to Experience	34.03±5.20	30.43±4.72	0.017*
Autonomy	26.71±5.05	25.79±7.05	0.551
Environmental Mastery	25.44±5.08	24.50±3.76	0.508
Personal Growth	28.65±4.84	26.93±4.53	0.216
Positive Relations with Others	27.62±6.09	26.00±4.93	0.348
Purpose in Life	29.02±4.74	27.79±5.01	0.371
Self-Acceptance	27.06±6.43	26.36±6.50	0.706
Total psychological well-being score	164.50±22.63	157.36±24.97	0.283

Number of participants 100. SD: Standard deviation, PWB: Psychological well-being; *P<0.05.

Table 4: Correlation (Pearson's coefficient) between Big five personality traits and Ryff scale PWB.

Ryff scale of PWB	Extraversion r (p value)	Agreeableness r (p value)	Conscientiousness r (p value)	Neuroticism r (p value)	Openness to Experience r (p value)
Autonomy	0.151	0.329*	0.319*	−0.402*	0.444*
Environmental Mastery	0.108	0.322*	0.564*	−0.468*	0.311*
Personal Growth	0.024	0.460*	0.289	−0.439*	0.292
Positive Relations with Others	0.323*	0.611*	0.132	−0.311*	0.327*
Purpose in Life	−0.028	0.270	0.482*	−0.413*	0.283
Self-Acceptance	0.283	0.520*	0.378*	−0.527*	0.440*
Total PWB score	0.220	0.601*	0.495*	−0.599*	0.497*

*Significant after Bonferroni correction (P<0.0017); Number of participants=100, PWB: Psychological well-being.

Table 5: Model summary of hierarchical regression analysis predicting dimensions of Ryff scale of PWB from sociodemographic characteristics and Big five personality traits of medical students

Dimension of PWB scale	R^2 Model 1	R^2 Model 2	ΔR^2	F change (5, 92)	p value
Autonomy	0.005	0.322	0.318	8.63	< 0.001
Environmental Mastery	0.007	0.455	0.448	15.13	< 0.001
Personal Growth	0.026	0.343	0.317	8.87	< 0.001
Positive Relations with Others	0.077	0.462	0.385	13.15	< 0.001
Purpose in Life	0.009	0.330	0.321	8.82	< 0.001
Self-Acceptance	0.023	0.526	0.503	19.52	< 0.001
Total PWB score	0.032	0.677	0.645	36.70	< 0.001

Number of participants 100. PWB: Psychological well-being; Model 1: gender and family income. Model 2: Model 1 plus the five personality traits.

Table 6: Hierarchical multiple linear regression of each dimension and the total score of Ryff scale of PWB on the Big five personality traits (n=100)

Dimension of PWB scale	Extraversion		Agreeableness		Conscientiousness		Neuroticism		Openness	
	β	t (p value)	β	t (p value)	β	t (p value)	β	t (p value)	β	t (p value)
Autonomy	0.034	0.37 (0.712)	0.002	0.01 (0.992)	0.122	1.23 (0.222)	−0.310**	−3.11 (0.003)	0.340**	3.04 (0.003)
Environmental Mastery	0.109	1.31 (0.194)	0.046	0.45 (0.654)	0.471***	5.29 (<0.001)	−0.297**	−3.33 (0.001)	0.039	0.39 (0.697)
Personal Growth	−0.063	−0.68 (0.498)	0.297*	2.63 (0.010)	0.104	1.06 (0.292)	−0.331**	−3.37 (0.001)	0.038	0.34 (0.735)
Positive Relations	0.249**	3.01 (0.003)	0.505**	4.94 (<0.001)	0.040	0.45 (0.654)	−0.153	−1.72 (0.089)	−0.061	−0.61 (0.543)
Purpose in Life	−0.058	−0.63 (0.530)	0.056	0.49 (0.625)	0.344***	3.49 (<0.001)	−0.276**	−2.78 (0.007)	0.095	0.85 (0.398)
Self-Acceptance	0.193*	2.47 (0.015)	0.206*	2.15 (0.034)	0.203*	2.45 (0.016)	−0.375***	−4.50 (<0.001)	0.148	1.57 (0.120)
Total PWB score	0.124	1.93 (0.057)	0.272***	3.44 (<0.001)	0.289***	4.22 (<0.001)	−0.407***	−5.90 (<0.001)	0.141	1.81 (0.074)

Number of participants 100. β: Standardised regression coefficient; t: t statistic for the corresponding coefficient. Values are those of Model 2, in which gender and family income were entered in Model 1 and the five personality traits added in Model 2, *P<0.05; **P<0.01; ***P<0.001.

Discussion

The present study examined the incremental contribution of the Big Five personality traits (PTs) to psychological well-being (PWB) among undergraduate medical students, beyond sociodemographic characteristics. PWB was assessed both globally and across the six dimensions of Ryff's multidimensional model.[8] This approach allowed associations between personality and distinct domains of psychological functioning to be examined. The key findings indicated that the Big Five PTs explained significant incremental variance in overall PWB after adjustment for sociodemographic characteristics. The hierarchical multiple regression (HMR) further revealed a differentiated pattern of predictions across the six dimensions of PWB.

Among the sociodemographic characteristics examined, gender emerged as the only characteristic associated with differences in both personality and PWB. Female participants scored significantly higher than male participants on agreeableness and positive relations with others, suggesting that gender differences in PWB may be considered alongside differences in interpersonal personality characteristics. In the HMR, gender and family income together explained 3.2% of the variance in overall PWB in model 1. With the addition of the five PTs in model 2, the explained variance increased to 67.7%, indicating that PTs accounted for significant additional variance in PWB beyond the sociodemographic characteristics. Notably, although gender was not a significant predictor in Model 1, it became significant after the Big Five traits were entered, with female students showing higher adjusted PWB scores than male students. This pattern suggests that the association between gender and PWB may become more apparent when individual differences in personality are taken into account. The higher

levels of agreeableness and positive relations with others observed among female participants may be relevant to this difference, particularly given the interpersonal and relational components of PWB. Nevertheless, these findings should be interpreted cautiously, as the cross-sectional design precludes conclusions regarding temporal directionality or causality among gender, personality and PWB.

The relatively limited contribution of sociodemographic characteristics to PWB is broadly consistent with previous research.[14,19] Among Indian medical undergraduates, sociodemographic characteristics did not significantly predict psychological distress, whereas trait emotional intelligence accounted for an additional 25% of the variance.[19] Similarly, in Nigerian adolescents assessed using the same 42-item scale, age and gender together accounted for only 2% of the variance in PWB.[14] Although these studies involved different populations and psychological constructs, their findings, together with the present results, suggest that sociodemographic characteristics may have limited explanatory value for individual differences in PWB. This may be particularly relevant in student populations, where restricted variability in characteristics such as age, educational status, and socioeconomic circumstances may attenuate their associations with PWB. More importantly, the greater incremental contribution of PTs in the present analysis highlights the potential value of considering individual psychological characteristics alongside sociodemographic factors when examining PWB among university students.

Beyond sociodemographic characteristics, the present study examined the associations between the Big Five PTs and PWB. Consistent with prior research, neuroticism showed a negative association with both global and all six dimensions of PWB. [21,22] This pattern suggests that its neuroticism may be relevant to well-being across multiple domains of positive psychological functioning rather than being confined to a specific aspect of PWB. In contrast, agreeableness, conscientiousness, and openness were positively associated with global PWB, although their associations varied across the individual dimensions. Extraversion was not significantly associated with global PWB but was positively associated with self-acceptance and positive relations with others, with no significant associations with the remaining dimensions. Taken together, these findings support a multidimensional view of the personality–PWB relationship, in which different traits may be differentially related to specific domains of well-being.

The negative association between neuroticism and PWB may be understood in the context of its established links with negative affect, emotional reactivity, and greater vulnerability to stress.[23] These characteristics may have implications across multiple aspects of PWB, including self-evaluation, interpersonal relationships, autonomy, environmental mastery, purpose in life, and personal growth. The breadth of this association across all six dimensions is noteworthy and is in line with previous research linking higher neuroticism with lower PWB.[22,24] The positive associations observed for conscientiousness, agreeableness, and openness may similarly reflect distinct aspects of psychological functioning: conscientiousness may be relevant to goal-directed behavior and effective management of life demands, agreeableness to interpersonal functioning and the quality of social relationships, and openness to engagement with new experiences and opportunities for personal development. The pattern for extraversion further illustrates the importance of examining PWB at the domain level. Its associations with self-acceptance and positive relations with others, in the absence of an association with global PWB, suggest that the relevance of extraversion may be more apparent in specific interpersonal and self-evaluative aspects than in overall well-being. Collectively, these interpretations reinforce the value of Ryff's multidimensional framework for identifying distinct patterns of personality–well-being relationships that may be obscured when PWB is treated as a single global construct.

HMR was used to determine the incremental and unique contribution of the Big Five PTs to PWB beyond sociodemographic characteristics. The addition of the Big Five PTs significantly increased the variance explained in overall PWB by 64.5%, indicating that personality traits provided incremental explanatory value in accounting for differences in PWB. In the final model, neuroticism, conscientiousness, and agreeableness made significant unique contributions to overall PWB, with Neuroticism emerging as the strongest negative predictor, whereas conscientiousness and agreeableness as positive predictors.

A differentiated pattern emerged across the six dimensions of PWB. Neuroticism showed the broadest unique associations, predicting five dimensions, whereas the other traits were linked to more specific domains. Conscientiousness uniquely predicted environmental mastery, purpose in life and self-acceptamce; agreeableness predicted positive relations with others, personal growth and self-acceptance; openness predicted autonomy, while extraversion uniquely predicted positive relations with others and self-acceptance. This pattern provides further evidence that personality traits show distinct domain-specific associations with PWB.

These observations partially converge with previous research based on Ryff's multidimensional framework, although the specific trait–domain patterns have varied across populations.[17,19] Among 636 Turkish higher-education students, conscientiousness (labelled responsibility) predicted environmental mastery and purpose in life, while extraversion predicted positive relations with others, and openness emerging as a strong predictor of personal growth.[25] Similarly, among Polish medical students neuroticism was negatively associated with all six PWB dimensions, and conscientiousness was particularly related to environmental mastery and purpose in life. However, differences were observed for openness and agreeableness across specific dimensions.[17] Overall, the findings show both convergence and divergence with previous research, particularly in the associations involving neuroticism and conscientiousness.

The domain-specific framework may be particularly relevant in medical education, where students must manage demanding academic and clinical responsibilities alongside interpersonal and personal demands.[17] In the present study, neuroticism showed the broadest pattern of unique associations, emerging as a significant predictor of overall PWB and five of its six

dimensions. This breadth may reflect the extent to which emotional reactivity, worry, and stress sensitivity can permeate multiple areas of psychological functioning particularly consequential within the demanding and evaluative context of medical training.[17] The absence of a unique association with positive relations with others, despite this dimension being associated with agreeableness and extraversion, may indicate that interpersonal well-being is more closely related to traits reflecting social functioning than to emotional vulnerability.

Environmental mastery had the lowest mean score among the six PWB dimensions. As this dimension reflects the perceived ability to manage and shape one's surroundings,[8] the structured and time-bound nature of medical training, including clinical postings and formative and summative assessments, may offer students relatively limited autonomy in managing their immediate environment.[26] Maintaining a sense of agency and effective functioning within such constraints may therefore represent a particular challenge during medical training. From a practical perspective, these findings suggest that approaches to supporting medical student well-being may benefit from addressing specific domains of PWB and individual differences in personality rather than treating well-being as a unitary construct.

Limitations and Future Directions

The findings should be interpreted in light of the following limitations. First, the cross-sectional design precludes conclusions about the direction or causality of the observed associations, while the use of self-report measures at a single time point may have introduced common-method bias. Second, internal consistency was modest for four of the six PWB subscales, particularly Personal Growth ($\alpha = 0.485$), which may have affected the strength of associations involving these dimensions.[8] Finally, the single-institution sample may limit generalisability, highlighting the need for replication across diverse medical student populations using longitudinal designs.

Conclusion

This study shows that personality is meaningfully associated with psychological well-being among medical students, with both the magnitude and pattern of associations varying across dimensions of PWB. Neuroticism emerged as the strongest and broadest unique correlate, whereas conscientiousness and agreeableness showed more selective associations with overall and dimension-specific PWB. Openness and extraversion were primarily associated with particular dimensions rather than global PWB, highlighting the domain-specific nature of personality–well-being relationships. Overall, these findings underscore the value of examining PWB as a multidimensional construct and considering individual differences when understanding psychological functioning among medical students. The findings may also help inform the development of targeted approaches to student well-being that consider both individual personality characteristics and specific domains of psychological functioning.

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Conflicts of interest

There are no conflicts of interest.

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