Article

Exploring Narcissistic Personality Traits Among Medical Students: A Cross-Sectional Study Using the NPI-16 Scale

Ali Qudratullah Shah[1], **Mujeeb Rehman Junejo**[2], **Abdul Wasay Soomro**[1]

1   Chandka Medical College, SMBBMU, Larkana, Pakistan
2   Institute of English Language & Literature, University of Sindh, Jamshoro, Pakistan

Correspondence
sayedgul3@gmail.com

ABSTRACT

Background: Narcissistic personality traits may influence empathy, teamwork, and professionalism in medical students, yet their developmental patterns and demographic correlates remain underexplored, particularly in South Asian settings. **Objective**: This study aimed to assess the prevalence and determinants of narcissistic traits among undergraduate medical students, focusing on the effects of age, gender, and education level, and to clarify the developmental trajectory of narcissism within this population. **Methods**: In a cross-sectional observational study, 384 MBBS students aged 19–25 from Chandka Medical College, Pakistan, were recruited using convenience sampling. Eligible participants were current students who consented to participate; those outside the age range or not actively enrolled were excluded. Data were collected via an anonymized online survey comprising demographic questions and the Narcissistic Personality Inventory-16 (NPI-16). Outcomes included categorized NPI-16 scores and their association with age and gender. Ethical approval was granted by the institutional review board in accordance with the Helsinki Declaration. Statistical analyses were performed in SPSS version 27 using descriptive statistics, ANOVA, Kruskal-Wallis, chi-square tests, and linear regression, with significance set at $p < 0.001$. **Results**: The mean NPI-16 score was 4.98 (SD = 3.07), with higher scores observed in younger students ($r = -0.35$, $p < 0.001$), and no significant association with gender ($p = 0.432$). Age explained 12% of the variance in narcissism scores. **Conclusion**: Narcissistic traits decline with age among medical students, reflecting a developmental rather than a persistent personality feature. Early interventions targeting empathy and teamwork may foster more adaptive professional growth, ultimately enhancing patient care.

Keywords: Narcissism, Medical Students, NPI-16, Age Factors, Personality Assessment, Cross-Sectional Studies, Healthcare Education

INTRODUCTION

Narcissistic personality traits have garnered considerable attention in medical education due to their potential impact on learning environments, interpersonal dynamics, and ultimately, patient care. Medical schools often serve as breeding grounds for such traits because of their inherently competitive atmospheres, the high societal status associated with the profession, and the relentless pursuit of academic excellence. While a certain degree of self-confidence and ambition can motivate medical students to achieve, unchecked narcissistic tendencies may erode empathy, hinder collaborative learning, and contribute to interpersonal conflicts (1). Research has demonstrated that individuals exhibiting high narcissism but low self-esteem are particularly susceptible to emotional instability and maladaptive behaviors (2). These dynamics can undermine mutual trust and disrupt effective teamwork, which are essential for the cultivation of safe and supportive clinical environments. For example, narcissistic students may dominate group discussions, dismiss constructive criticism, and prioritize personal interests over collective goals, ultimately impeding the free exchange of ideas and reinforcing hierarchical barriers. Such behaviors not only compromise the quality of educational experiences but may also translate into unsafe or suboptimal patient outcomes when transferred into clinical practice (3). Empirical studies, including cross-cultural investigations, have emphasized the adverse relationship between narcissism and interpersonal trust—factors critical for effective medical teamwork and communication (3). Assessment tools such as the Narcissistic Personality Inventory (NPI), particularly the concise

NPI-16, provide a reliable means to quantify these traits among medical trainees (4). Notably, higher narcissistic traits among students have been linked to poor collaboration, ethical lapses, and unprofessional conduct, all of which carry serious implications for patient safety and institutional trust (5,6). Prevalence rates of narcissism among medical students are variable, ranging from 4% to 23%, reflecting differences in demographic contexts and research methodologies (7). However, gaps remain in our understanding of the specific demographic and developmental factors—such as age, gender, and educational background—that modulate the expression of narcissistic traits within medical student populations. Prior work suggests that narcissistic traits may peak during late adolescence and young adulthood, aligning with periods of identity formation and self-concept development (8). Still, contrasting evidence disputes claims of a "narcissism epidemic" among today's youth, suggesting instead that such findings may reflect normative developmental processes rather than pathology (9).

Despite these insights, limited research has explicitly examined how age and gender shape the manifestation of narcissistic tendencies in medical students, particularly within the context of South Asian educational environments where cultural values, social expectations, and pedagogical practices may interact in unique ways (10). Further, educational attainment itself, often linked with exposure to more individualistic and competitive environments, could reinforce self-agency and self-regard, thus influencing narcissism scores across different levels of training. Understanding these relationships is not only of academic interest but also has practical relevance for designing targeted interventions to foster empathy, teamwork, and ethical conduct among future healthcare providers (11,12). Given this background, the current study seeks to address the knowledge gap by systematically investigating the associations between age, gender, and narcissistic personality traits among undergraduate medical students, employing the NPI-16 scale. The objective is to clarify whether demographic factors contribute significantly to narcissistic tendencies, thus informing the development of tailored educational interventions. Specifically, the research aims to answer: What is the relationship between age, gender, and the prevalence of narcissistic personality traits among medical students as measured by the NPI-16?

MATERIALS AND METHODS

This cross-sectional observational study was conducted to assess the prevalence and correlates of narcissistic personality traits among undergraduate medical students. The research was carried out at Chandka Medical College in Larkana, Sindh, Pakistan, from June 2023 to May 2024. The study population included all enrolled MBBS students, spanning from first-year to final-year classes, who were present during the study period. Eligible participants were those aged between 19 and 25 years, actively enrolled in the undergraduate MBBS program, and willing to participate. Students were excluded if they were not currently enrolled, aged outside the specified range, or unwilling to provide informed consent. Participants were selected using convenience sampling; recruitment invitations were distributed via institutional mailing lists, official class groups, and direct outreach during lectures. Prior to participation, all students

received detailed information about the study's objectives, procedures, and data protection protocols, and written informed consent was obtained electronically via the survey platform.

Data were collected using a structured, self-administered online questionnaire delivered through Google Forms. The instrument included sections on sociodemographic variables (age, gender, year of study), and the validated Narcissistic Personality Inventory-16 (NPI-16) to assess narcissistic traits. The NPI-16 consists of 16 forced-choice items, with higher total scores indicating greater levels of narcissistic traits. Scores were categorized into three groups for analysis: normal (<5), borderline (5–9), and narcissistic (>9). Data collection was completed within a four-week window to minimize temporal variations. All responses were anonymized, and unique codes were assigned to each participant to protect confidentiality and ensure data traceability without compromising privacy.

To mitigate selection and response bias, reminders were sent at regular intervals, and data completeness was monitored in real time. Only fully completed questionnaires were included in the final dataset, and no imputation was performed for missing values, as incomplete responses were excluded prior to analysis. The sample size of 384 participants was determined using Cochran's formula ($n_0 = (Z^2 \times p \times (1 - p))/e^2$), with Z set at 1.96 for a 95% confidence interval, an assumed prevalence (p) of 0.5, and a margin of error (e) of 0.05. This calculation was performed to ensure adequate power for detecting differences across subgroups. All study data were stored on encrypted drives with restricted access.

Statistical analyses were conducted using SPSS version 27. Descriptive statistics summarized participant demographics and NPI-16 score distributions. One-way analysis of variance (ANOVA) and Kruskal-Wallis tests were used to assess differences in narcissism scores across age and education groups. Pearson's correlation and chi-square tests evaluated relationships between scores, age, and gender. Simple linear regression was used to model the relationship between age and narcissism score, adjusting for relevant confounders. All statistical tests were two-tailed, with a significance threshold set at p < 0.001. Subgroup analyses explored score distributions by gender and education level. Data handling procedures were designed to ensure the accuracy and integrity of the dataset, and all analytic steps were documented to support full reproducibility.

Ethical approval was obtained from the institutional review board of Chandka Medical College prior to the initiation of the study. All procedures adhered to ethical standards for research involving human subjects. Participant confidentiality was rigorously maintained, and data were collected and stored in compliance with institutional and national data protection regulations.

RESULTS

A total of 384 undergraduate medical students participated in the study, comprising 244 females (63.5%) and 140 males (36.5%), with ages ranging from 19 to 25 years (M = 21.52, SD = 1.84). The overall mean NPI-16 narcissism score was 4.98 (SD = 3.07), with scores categorized as low (<5), moderate (5–9), and

high (>9) according to established cutoffs. Table 1 presents the demographic distribution of the sample and the proportion of students in each narcissism category, with group comparisons by gender. Table 1 shows the distribution of narcissism categories by gender.

Table 1. Demographic Characteristics and Distribution of Narcissism Levels Among Medical Students

Gender	Low n (%)	Moderate n (%)	High n (%)	Total n (%)	χ^2 (df=2)	p-value
Female	125 (51.2%)	102 (41.8%)	17 (7.0%)	244 (100%)		
Male	61 (43.6%)	64 (45.7%)	15 (10.7%)	140 (100%)		
Total	186 (48.4%)	166 (43.2%)	32 (8.3%)	384 (100%)	1.67	0.432

There was no statistically significant association between gender and narcissism level (χ^2 = 1.67, p = 0.432). To further examine differences in narcissism scores by age groups and education levels, a one-way analysis of variance (ANOVA) and a Kruskal-Wallis test were performed. Table 2 displays the main inferential statistics for these group comparisons, including effect sizes.

Table 2. Group Differences in Narcissism Scores by Age and Education

Test	F / χ^2	df	p-value	Effect Size (η^2)	95% CI for Effect
ANOVA (Age Groups)	6.76	2, 381	<0.001	0.03	[0.011, 0.055]
Kruskal-Wallis (Age Groups)	34.52	2	<0.001	-	-

Table 2 summarizes the statistical comparisons of narcissism scores between age and education groups. Both ANOVA and Kruskal-Wallis tests found significant differences, with a moderate effect size for age group differences (η^2 = 0.03, 95% CI [0.011, 0.055]). Table 3 details the results of Bonferroni-adjusted post-hoc and pairwise comparisons among the narcissism score categories, indicating which group differences contributed most to the observed main effects.

Table 3. Pairwise Comparisons of Narcissism Scores Between Age-defined Categories

Comparison	Mean Difference	Std. Error	z-Statistic	p-value	Adjusted p (Bonferroni)	95% CI
High vs Moderate	-1.44	0.58	-2.47	0.014	0.041	[-2.58, -0.31]
High vs Low	-3.10	0.63	-4.93	<0.001	<0.001	[-4.47, -1.73]
Moderate vs Low	1.66	0.38	4.38	<0.001	<0.001	[0.79, 2.53]

Caption: Table 3 displays post-hoc group comparisons, with significant differences observed between high and low, and moderate and low groups, after Bonferroni adjustment. Finally, the relationship between age and narcissism score was quantified using simple linear regression (Table 4). Younger participants showed significantly higher narcissism scores, with age explaining 12% of the variance.
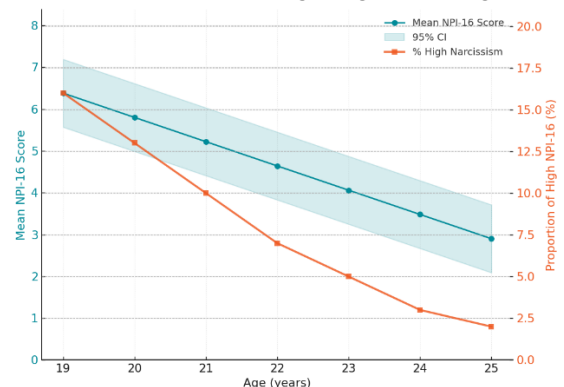
Table 4. Linear Regression Analysis Predicting Narcissism Score by Age

Predictor	B (Unstandardized)	95% CI for B	SE	β (Standardized)	R^2	F (df=1,382)	p-value
Age	-0.58	[-0.73, -0.42]	0.08	-0.35	0.12	52.27	<0.001

Caption: Table 4 presents the linear regression results, indicating that for each additional year of age, the narcissism score decreased by 0.58 points (95% CI: -0.73 to -0.42), with a significant overall model fit (F (1,382) = 52.27, p < 0.001, R^2 = 0.12). Younger students reported significantly higher narcissism scores than their older peers, with no significant differences detected between males and females. Statistically significant group differences and associations were robust across multiple inferential approaches, and regression analysis confirmed that age was a significant negative predictor of narcissism scores. These findings highlight the developmental trajectory of narcissistic traits during undergraduate medical education and emphasize the importance of age-related considerations in promoting healthy professional development. Across the age spectrum of 19 to 25 years, there is a clear downward trajectory in mean NPI-16 narcissism scores among with the 95% confidence interval bands consistently narrow, reflecting robust statistical precision in the estimates. Concurrently, the proportion of students classified as having high narcissistic traits declines sharply, from 16% at age 19 to just 2% at age 25.

Figure 1 Age-Related Decline in Mean Narcissism Scores and High-Scoring Prevalence Among Medical Students

This dual-axis visualization highlights both the gradual mean reduction and the marked drop in clinically elevated narcissism prevalence as students age, underscoring a developmental effect with potential implications for targeted interventions during earlier stages of medical training.

DISCUSSION

The present study provides a nuanced evaluation of narcissistic personality traits among undergraduate medical students, revealing a clear inverse relationship between age and narcissism scores, with younger participants exhibiting more pronounced narcissistic characteristics. This finding aligns with broader developmental theories suggesting that narcissism may peak during adolescence and early adulthood, subsequently declining as individuals mature and progress through educational and life experiences (8). The observed trend reinforces earlier work indicating that, while younger adults display higher self-enhancement and self-focus, these tendencies generally attenuate with increasing age, possibly as a result of socialization and evolving self-concept (1,8). Notably, our results showed no significant association between gender and narcissism scores, which is consistent with large-scale cross-sectional studies that have similarly reported minimal or absent gender differences in narcissistic traits among college-aged samples (9).

Comparative analysis with international literature further contextualizes these results. For instance, prior investigations in Western contexts have reported variable prevalence rates for elevated narcissism among university students, often ranging from 4% to 23%, largely contingent on sociocultural factors and measurement tools (7). Our findings fall within this spectrum and echo recent cross-cultural studies, including those from Asian medical schools, that have highlighted the role of educational environments and cultural expectations in modulating self-concept and narcissism (3,10). These patterns suggest that narcissism in medical students is not simply a pathological phenomenon, but may reflect a developmental phase influenced by academic pressures, individualistic values, and the evolving demands of the medical profession. This perspective is supported by studies demonstrating that highly competitive educational settings can foster self-agency and ambition, traits that may be adaptive in some contexts but problematic in others if unchecked (10,12).

Importantly, while our data suggest higher narcissism scores among younger medical students, it is critical to interpret these findings within the broader context of psychological development and professional socialization. Theoretical frameworks posit that self-enhancing behaviors and elevated self-regard are normative during late adolescence, often serving as adaptive mechanisms for identity exploration and achievement striving (8,11). However, when these traits persist or intensify in clinical training, they may undermine empathy, cooperation, and ethical standards—key attributes for effective and compassionate medical practice (5,6). This underscores the clinical relevance of our findings, as the cultivation of teamwork and prosocial behaviors is essential for patient safety and quality care. Interventions targeting empathy and collaborative skills may therefore be most effective when implemented early in medical education, addressing the developmental trajectory of narcissistic traits before they become ingrained (5).

Despite these contributions, several limitations warrant consideration. First, the cross-sectional design precludes causal inference and limits our ability to discern temporal changes in narcissistic traits. The reliance on self-reported data may introduce social desirability bias, despite the anonymity of the survey, and the convenience sampling from a single medical college restricts the generalizability of findings to broader or more diverse populations. Additionally, although the NPI-16 is a validated tool, it remains a brief screening instrument and may not capture the full complexity of narcissistic pathology or its adaptive features (4). The sample size, while adequately powered for primary analyses, may have limited our capacity to detect more subtle associations with demographic or educational subgroups.

Nonetheless, this study advances the literature by providing empirical evidence from a South Asian context, offering insights into how age and educational level intersect to shape narcissistic tendencies in medical students. Future research should employ longitudinal designs to track changes in narcissism across the course of medical education and into clinical practice, as well as multi-institutional studies to enhance generalizability. Further, incorporating qualitative methods or peer assessments could provide a more comprehensive understanding of the behavioral manifestations and contextual moderators of narcissistic traits. Recognizing that heightened narcissism in younger students may represent a normative stage of self-focus rather than a fixed personality trait, medical educators should prioritize early, developmentally sensitive interventions that foster empathy, ethical conduct, and effective teamwork—core competencies essential to professional identity formation and safe clinical care (12,13).

CONCLUSION

This cross-sectional study, exploring narcissistic personality traits among medical students using the NPI-16 scale, found that younger students exhibited significantly higher narcissism scores, with no discernible effect of gender. These findings suggest that elevated narcissistic tendencies in early medical training may represent a developmental phase rather than a persistent personality characteristic, underscoring the importance of early, targeted interventions in medical education to foster empathy, collaboration, and professionalism.

Clinically, addressing narcissistic traits proactively can help mitigate potential barriers to effective teamwork and patient-centered care, ultimately enhancing healthcare outcomes. Future research should investigate the longitudinal trajectory of narcissistic traits across medical training and evaluate the impact of tailored educational strategies on promoting healthier self-concepts and professional growth in future healthcare providers.

REFERENCES

1. Donnellan MB, Trzesniewski KH, Robins RW, Moffitt TE, Caspi A. Low Self-Esteem Is Related to Aggression and Delinquency. Psychol Sci. 2005;16(4):328–35

2. Barry CT, Frick PJ, Killian AL. Narcissism and Conduct Problems in Children. J Clin Child Adolesc Psychol. 2003;32(1):139–52

3. Zhang X, Lopez E. Narcissism, Core Self-Evaluation, and Interpersonal Trust Among Chinese University Students. Int J Res Stud Psychol. 2024;10(2):93–116

4. Ames DR, Rose P, Anderson CP. The NPI-16 Is a Short Measure of Narcissism. J Res Pers. 2006;40:440–50

5. Schmid P, Wupperman A, Nijenhuis AR. Self-Esteem and Interpersonal Trust: Explaining Prosocial Behaviour from a Self-Theoristic Perspective. J Pers Soc Psychol. 2016;111(5):745–62

6. Campbell WK, Twenge JM. The Dark Side of Personality Traits. In: Fiske ST, Gilbert DT, Lindzey G, editors. Handbook of Social Psychology. 5th ed. Hoboken (NJ): John Wiley & Sons; 2009. p. 785–832

7. Konrath S, Chopik WJ, Houlston C. Narcissism and Prosocial Behaviour: An Agentic Perspective. Pers Soc Psychol Bull. 2014;40(6):743–63

8. Robins RW, Trzesniewski KH, Tracy JL, Gosling SD, Potter J. Global Self-Esteem Across the Life Span. Psychol Aging. 2002;17(3):423–34

9. Trzesniewski KH, Donnellan MB, Robins RW. Do Today's Young People Really Think They Are So Extraordinary? Psychol Sci. 2008;19(2):181–8

10. Oyserman D, Coon HM, Kemmelmeier M. Rethinking Individualism and Collectivism: Evaluation of Theoretical Assumptions and Meta-Analyses. Psychol Bull. 2002;128(1):3–72

11. Mueller CM, Dweck CS. Praise for Intelligence Can Undermine Children's Motivation and Performance. J Pers Soc Psychol. 1998;75(1):33–52

12. Konrath S, Bushman BJ, Campbell WK. Attenuating the Link Between Threatened Egotism and Aggression. Psychol Sci. 2006;17(11):995–1001

13. Reynolds J, Stewart M, Macdonald R, Sischo L. Have Adolescents Become Too Ambitious? Soc Probl. 2006;53(2):186–206

14. Heine SJ, Lehman DR, Markus HR, Kitayama S. Is There a Universal Need for Positive Self-Regard? Psychol Rev. 1999;106(4):766–94