ISSN 0973-2063 (online) 0973-8894 (print)

Bioinformation 22(8): 4797-4800 (2026)

BIOINFORMATION
Discovery at the interface of physical and biological sciences

BIOMEDICAL INFORMATICS

www.bioinformation.net

Volume 22(8)

Research Article

Received August 1, 2026; Revised August 31, 2026; Accepted August 31, 2026, Published August 31, 2026

DOI: 10.6026/973206300224797

SJIF 2026 (Scientific Journal Impact Factor for 2026) = 8.478
2022 Impact Factor (2023 Clarivate Inc. release) is 1.9

Edited by Vini Mehta
E-mail: vmehta@statsense.in
Citation: Prasad *et al.* Bioinformation 22(8): 4797-4800 (2026)

Determining the frequency of imposter syndrome among Indian medical undergraduate students by evaluating correlation with social comparison and personality traits

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ISSN 0973-2063 (online) 0973-8894 (print)
Bioinformation 22(8): 4797-4800 (2026)

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Abstract:
Imposter syndrome can adversely affect the psychological well-being and academic experience of medical students, yet its relationship with social comparison and personality traits remains insufficiently explored among Indian medical undergraduates. The present study included 200 medical students who were evaluated using the standardized tools to assess Imposter syndrome as NEOFive Factor Inventory (NEO-FFI), Clance Impostor Phenomenon Scale (CIPS), Social Comparison Scale (SCS), and Beck Anxiety Inventory (BAI) to judge the presence of Imposter syndrome. Data shows higher prevalence of imposter syndrome among students MBBS students with a strong correlation to anxiety, social comparison, and neuroticism.

Keywords: Anxiety, emotional regulation, impostor syndrome, MBBS, personality traits, social comparison

Background:
Imposter phenomenon, popularly known as imposter syndrome has a peculiar characteristic associated with a feeling of fear about getting caught or exposed as an intellectually fraud person despite of availability of established evidence of competence and success **[1].** This psychology pattern is more commonly being observed in students that are achievers particularly from the medical background and commonly internalize and consider their achievement as non-deserving or attribute it to their luck **[2].** The medical background is usually demanding and competitive for its students and can exaggerate the experiences associated with the imposter phenomenon or imposter syndrome. The medical culture which is associated with academic pressure, frequent assessments, and associated perfectionism can lead to psychological stress that can further diminish the well-being and confidence in students affected by the imposter phenomenon **[3]**. Continued feelings and consideration of one-self as an imposter have been associated with various adverse events including depression, burnout, anxiety, and/or poor academic performance **[4]**. Existing data from the literature has depicted a confirmed association in imposter phenomenon and the personality traits of students with imposter syndrome. These personality traits are being mentioned as high neuroticism and low conscientiousness. Also, negative social comparison and tendency towards perfectionism have been associated with the reinforcement of various thoughts of being considered as an imposter **[5, 6]**. The description of such links has been scarce in the existing literature data, particularly considering the medical background students from MBBS curriculum of India. Even where such links are being mentioned, it has not been explored how the anxiety and imposter phenomenon has evolved in various years of the MBBS training **[7, 8]**. Therefore, it is of interest to judge the imposter syndrome prevalence in medical undergraduate Indian students and assessing its association with social comparison and personality traits.

Materials and Methods:
This prospective cross-sectional observational study aimed to determine the prevalence of imposter syndrome among Indian medical undergraduate students and assess its association with social comparison and personality traits. The study subjects were from Department of Psychiatry of the Institute. Verbal and written informed consent was taken from all the subjects before study participation. The present study assessed 264 undergraduate students from the MBBS curriculum that were randomly selected. The MBBS students were from 1st year MBBS to final year MBBS. The study included subjects selected randomly. The identity of the subjects was kept confidential and anonymous. Equal numbers of students were selected from each year. The present study included 200 medical students enrolled in the MBBS course and was included randomly for study participation. The study included subjects studying MBBS from the Institute, gave consent to participate in the trial, not on any psychotropic medication, and not under any psychiatry treatment at present, and not on any psychotropic medication. The study excluded subjects that did not provide the consent, under psychiatric management, using chronic psychotropic drug, verified from checklist based on DSM-5 symptom criteria, and were self-verified. For study data collection, a pretested questionnaire which was semi-structured was used that included 5 sections pertaining to sociodemographic data as the standardized tools to assess personality traits including Imposter syndrome as NEOFive Factor Inventory (NEO-FFI), **[5]**. Clance Impostor Phenomenon Scale (CIPS), **[6]**. Social Comparison Scale (SCS) **[7]** and Beck Anxiety Inventory (BAI) **[8]**. To judge the presence of Imposter syndrome where CIPS is self-reported questionnaire comprising of 20-items assessed with a 4-point

Likert scale. Other 4 domains of questionnaire were age, gender, academic year, and family income. Data were gathered using a semi-structured, pretested questionnaire that comprised of five sections as sociodemographic data including family income, academic year, gender, and age of the subjects; personality traits assessed using the NEO-Five Factor Inventory (NEO-FFI) **[9]**. Imposter syndrome assessed using CIPS (Clance Impostor Phenomenon Scale) which is a self-reported questionnaire of 20 items assessed on 4-point Likert scale of 0-3, **[10]**. Anxiety assessed with BAI (Beck Anxiety Inventory) which is a 21-item scale assessing symptoms of anxiety over the past week, **[11]**. Social comparison assessed with Social Comparison Scale (SCS), where higher scores indicate more favourable self-evaluation relative to others **[12]**. The questionnaire was given physically in class and was collected anonymously. Statistical analysis in the study was performed using the chi-square test, Fisher's exact test, Mann Whitney U test, and SPSS (Statistical Package for the Social Sciences) software version 24.0 (IBM Corp., Armonk. NY, USA) using ANOVA, chi-square test, and student's t-test. The significance level was considered at a p-value of <0.05.

Results:

This present cross-sectional observational study was aimed to judge the imposter syndrome prevalence in medical undergraduate Indian students and assessing its association with social comparison and personality traits. The present study included 200 medical students enrolled in the MBBS course and was included randomly for study participation. These 200 subjects were then evaluated using the standardized tools to assess Imposter syndrome as NEO-Five Factor Inventory (NEO-FFI), Clance Impostor Phenomenon Scale (CIPS), Social Comparison Scale (SCS), and Beck Anxiety Inventory (BAI) to judge the presence of Imposter syndrome. Among 200 MBBS students, there were 55% (n=110) males and 45% (n=90) female subjects. The mean age of participants was 21.5±1.8 years. There were 22% (n=44), 28% (n=56), 28% (n=56), and 22% (n=44) subjects from MBBS year 1st, 2nd, 3rd, and final year respectively. Concerning imposter syndrome prevalence following the CIPS scores, few (mild), moderate, frequent, intense, and clinically significant imposter syndrome was seen in 15% (n=30), 39% (n=78), 32% (n=64), 14% (n=28), and 46% (n=92) subjects respectively. The study results showed that for average CIPS scores in study participants from different academic years of MBBS curriculum, imposter scores were 62.5±13.2 and 54.9±11.1 in females and male study subjects respectively depicting a statistically significant difference with p=0.001. Concerning the year of MBBS curriculum, an increase was noted in mean CIPS scores with least scores in MBBS first year students that increased to MBBS 2nd, 3rd, and 4th year respectively. The difference was highly statistically significant with p=0.03 **(Table 1)**. It was seen that for Spearman's correlation for the different traits in study participants from MBBS curriculum, the correlation coefficient values for neuroticism, openness, extraversion, agreeableness, and conscientiousness were 0.55, -0.06, -0.35, -0.18, and -0.38 respectively with a statistically significant correlation in imposter syndrome and neuroticism, extraversion, agreeableness, and conscientiousness with p-values of <0.001, <0.001, 0.01, and <0.001 respectively. However, a non-significant correlation was seen in imposter syndrome and openness with p=0.277 **(Table 2)**. Concerning the linear regression analysis in study participants from MBBS curriculum, it was noted that 65% (n=130) subjects had some level of anxiety in them. Significantly higher scores for anxiety were seen in subjects with CIPS >61 which was significant with p<0.001. A strong correlation was seen in imposter syndrome with neuroticism, female gender, conscientiousness, social comparison, and BAI scores for anxiety with respective p-values of <0.001, 0.01, 0.001, 0.001, and <0.001 **(Table 3)**.

Table 1: Average CIPS scores in study participants from different academic years of MBBS curriculum

S. No	Year of curriculum	Mean CIPS
1	**1st year**	52.2±10.4
2	**2nd year**	55.4±11.2
3	**3rd year**	59.5±12.1
4	**4th year**	63.6±12.9
5	**p-value**	**0.03**

Table 2: Spearman correlation for the different traits in study participants from MBBS curriculum

S. No	Trait	Correlation	p-value
1	**Neuroticism**	0.55	**<0.001**
2	**Openness**	-0.06	0.277
3	**Extraversion**	-0.35	**<0.001**
4	**Agreeableness**	-0.18	**0.01**
5	**Conscientiousness**	-0.38	**<0.001**

Table 3: Linear regression analysis in study participants from MBBS curriculum

Predictor	r- value	95% CI	p-value
Academic year	0.12	-0.02, 0.22	0.08
Neuroticism	0.43	0.26, 0.53	**<0.001**
Female gender	0.14	0.01, 0.28	**0.01**
Conscientiousness	-0.21	-0.38, 0.11	**0.001**
Social comparison	-0.21	-0.37, 0.11	**0.001**
BAI score (anxiety)	0.27	0.14, 0.40	**<0.001**

Discussion:

The present study depicted a high imposter syndrome prevalence in 46% (n=92) subjects from all the years of the MBBS curriculum. These findings were consistent with those reported by Bravata *et al.* **[13]** in 2020, who examined impostor syndrome in educational settings and reported a comparable prevalence. The gender difference in the study was significant with higher scores for imposter syndrome reported by females compared to the males which was consistent with the earlier studies **[14]**. This pattern can be attributed to the sociocultural factors that affect the way achievements are varyingly internalized in the genders concerning the educational environments that are competitive. The study findings also reported a positive and strong correlation in imposter syndrome and neuroticism providing substantial evidence that being emotionally vulnerable functions as a fundamental psychological substrate for experience of being an imposter. Individuals that have a high neuroticism scores experience high negative effects and emotional reactions that create a background associated with self-doubt even in cases with objective success as also reported by Sawant *et al.* **[15]**. In 2023 and these data extend earlier work that identify neuroticism as a trait of personality which has strongest association with the imposter beliefs across different academic

and professional backgrounds. In the study, conscientiousness was seen a significant factor linked to imposter syndrome with p=0.001 depicting that persistence, organization, and goal-directed behavior can act as buffer to shield the feelings of being an imposter. This effect is protective and probably functions Vis increased confidence in completion of the task and better self-regulation that allows individuals with conscientiousness to internalize their accomplishments as resulting from their efforts are not by chance as depicted in the work of Langton & Morley **[16]** in 2025. The negative association seen in imposter syndrome and extraversion reports that positive emotionality and social engagement can help in imposter experience mitigation probably via better opportunities for social validation and positive feedback. The study data also reported a two-directional relation in imposter syndrome and anxiety with both having potential of reinforcing each other in a maladaptive fashion. A significant correlation noted suggested that interventions aimed at either factor can be beneficial for both. This relationship is concerning for medical education where there is high prevalence of performance anxiety and which may further affect the distress of imposter syndrome. An increase in the imposter syndrome scores with higher professional years also report a significant result that need to be interpreted carefully. It can be derived that better competency can be related to decrease in the feelings of being an imposter, the results from the present study reported that increased pressure of evaluations with progressive years in strict medical curriculum can intensify the imposter feelings. These findings were in line with the theory of competence-difficulty gap where expectation for performance and increase in responsibilities outgrow subjective sense of competence growth in students as discussed by Flägel *et al.* **[17]** in 2022. The transition in MBBS from theoretical to clinical training with advancing years that use observational assessment and increased stakes can exacerbate the experience of being an imposter. Social comparison has been evolved as a significant factor for prediction of imposter syndrome with p=0.001 that highlight the role of interpersonal evaluation processes that help in shaping self-perception. Medical education is competitive environment which could facilitate the comparisons that are unfavourable, particularly when students compare among them to perceive high achievement overlooking the factors that affect the performance as suggested by pioneer study of Finch **[18]** in 2026. A significant strength in this association report that intervention that promote real social comparison and emphasize on the fact that individual growth can decrease the experience of being an imposter. On regression analysis, it was seen that considerate variation in scores of imposter syndrome can indicate that psychological factors identified in imposter syndrome can indicate that psychological factors that are identified can provide meaningful insight into imposter syndrome etiology in subjects from MBBS curriculum. Understanding of this multifactorial etiology can suggest that comprehensive interventions that address social comparison tendencies, anxiety management, and personality vulnerabilities can be more effective than other approaches **[19, 20]**.

Conclusion:

We show that higher prevalence of imposter syndrome is seen among MBBS students with a strong correlation to anxiety, social comparison and neuroticism. Distress associated with imposter syndrome can be decreased using targeted and specific psychological interventions that focus on social evaluation and emotions regulation that could promote well-being of affected subjects.

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