ORIGINAL ARTICLE

Impostor Syndrome Among Medical Students: A Comparative Study of Public and Private Medical Institutions in Pakistan

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ABSTRACT

Objective: To determine and compare the prevalence of impostor syndrome among students of public and private medical colleges in Pakistan

Methodology: This cross-sectional study included 430 MBBS students from public and private medical schools in Pakistan from March 2025 to June 2025. These students were selected using simple random sampling. They completed an online form that used the Clance Impostor Phenomenon Scale (CIPS). Jamovi software was used to analyze the data. Variables such as age, medical school type, and year of study were analyzed to determine the severity of impostor feelings.

Results: In total, 91.4% of students in the study had moderate to severe feelings of being an impostor. Fourth-year students experienced it the most, suggesting that they may face challenges as they begin clinical training. Female students (58%) were more affected than male students. No significant difference was noted between students from public and private medical schools.

Conclusion: The widespread prevalence of impostor syndrome in all groups shows a strong need for quick action through mental health initiatives in medical schools. Plans should aim to build resilience, promote mentorship, and encourage acceptance of imperfection. This helps to support student well-being, regardless of their medical school type.

Keywords: Clance impostor phenomenon scale, impostor phenomenon, medical students, mental health, perfectionism, self-doubt

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INTRODUCTION

Impostor Syndrome (IS) is defined as a persistent failure to take personal achievements and fear of being found out as incompetent, despite objective achievement[1]. Clance and Imes initially defined IS in 1978 and it has since been recognized in numerous high-achieving careers such as medicine[2].

In medical education, the impostor syndrome (IS) is significantly common with a percentage of between 22.5 and 46.6%[3]. The demanding nature of medical education, the culture of competitive exams, and the hierarchical learning environments may worsen the feelings of inadequacy and anxiety, especially in female students and early trainees[4,5]. The impostor syndrome among medical students has been associated with anxiety, depressive symptoms, low self-esteem, burnout, poor academic achievement, and a lack of confidence during clinical training. Such psychological consequences may affect the learning process, clinical judgment, and the general professional growth6. Existing studies from different regions have recorded different prevalence trends and emphasized the links with gender, culture of the institution, academic stress, and competitive learning conditions[6,7]. Nevertheless, the vast majority of studies have concentrated on a single institution or even a single sector, and have not compared medical students in the public and private sectors of education in Pakistan.

Medical colleges in Pakistan are different in terms of academic pressure, competition, number of classes in colleges, clinical exposure, and institutional support systems between the public and the private colleges.

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With these structural and cultural variations, it is significant to compare impostor syndrome in the two sectors to determine whether there are institutional specifics in the factors that can cause psychological burden. The objective of the study was to determine the prevalence and severity of the impostor syndrome among medical students in Pakistan and to compare the trends across the public and private medical institutions. Additionally, the study has also focused on relationships with gender, year of study, and awareness of impostor syndrome.

METHODOLOGY

IRB/ERC Approval:

The Institutional Review Board of Islam Medical and Dental College, Sialkot, granted permission for the study protocol under registration number 900/IMC/ERC/000103.

A descriptive cross-sectional study was conducted between March and June 2025 across public and private medical schools in Pakistan. Data were collected using a self-administered questionnaire designed in Google Forms and distributed through LinkedIn and WhatsApp platforms. Participation was entirely voluntary, and informed consent was obtained from all participants prior to data collection. Confidentiality and anonymity were strictly maintained throughout the study. Medical students from 11 medical colleges across Pakistan participated, representing both public and private sectors. Public institutions included King Edward Medical University, Jinnah Sindh Medical University, Bolan Medical College, and Khyber Medical College, while private institutions included Islam Medical College, Avicenna Medical College, Jinnah Medical College, United Medical and Dental College, Quetta Institute of Medical Sciences, Northwest School of Medicine, and Rehman Medical College.

All MBBS students from first to final year were eligible for inclusion in the study. Students who reported having a pre-existing mental health condition were excluded to minimize potential confounding. Participants were selected using a simple random sampling technique. The minimum required sample size was calculated using Cochrane's formula for large populations, assuming a 95% confidence level, a 50% estimated population proportion, and a 5% margin of error. The initial sample size was calculated as 384.16. Since the total population of medical students across the selected institutions was approximately 11,000, a finite population correction was applied, resulting in an adjusted sample size of approximately 371. To enhance statistical power and account for non-response or incomplete questionnaires, the final sample size was increased to 430 participants.

Data were collected using a structured questionnaire comprising two sections. The first section included demographic information such as age, gender, year of study, and type of institution (public or private). The second section consisted of the Clance Impostor Phenomenon Scale (CIPS), a validated 20-item instrument used to assess the severity of impostor feelings.

The primary outcome of the study was the prevalence and severity of impostor syndrome, measured using total CIPS scores. The main independent variable was the type of medical school (public versus private). Additional variables included gender, academic year, and age, which were considered potential confounders. Students with self-reported pre-existing mental illness were excluded from the analysis.

Several measures were implemented to reduce bias. Selection bias was minimized through random sampling, while information bias was reduced by using a standardized and validated instrument (CIPS). Ensuring participant anonymity and confidentiality helped reduce social desirability bias.

Statistical analysis was performed using Jamovi software. Descriptive statistics, including means, standard deviations, frequencies, and percentages, were used to summarize participant characteristics. Pearson's chi-square test was applied to assess associations between categorical variables. Mean CIPS scores across different academic years and institution types were compared using one-way analysis of variance (ANOVA). Although comparisons involved only two groups in some analyses, one-way ANOVA was used to maintain consistency across statistical procedures, as it yields equivalent results to an independent t-test while allowing standardized handling of multiple comparisons and control of potential Type I error.

Sample size:

The minimum required sample size was calculated using Cochrane's formula, which is appropriate for large populations:

$$N = \frac{Z^2.p.1-p}{e^2}$$

Where:

N= first sample size
Z = Z-score corresponding to the desired confidence level
p = estimated proportion of the population with the characteristic
e = margin of error (set at 5% or 0.05)

$$N = \frac{(1.96)^2.0.5.(1-0.5)}{(0.05)^2} = \frac{3.8416-0.25}{0.0025} \frac{0.9604}{=0.0025} = 384.16$$

Since the population size was finite (approximately 11,000 medical students in selected medical colleges of Pakistan), the sample size was adjusted using the finite population correction:

$$N = \frac{n_0}{1+(\frac{n_0-1}{N})} \frac{384.16}{=1+(\frac{384.16-1}{11000})} \frac{384.16}{=1+0.0349} = \frac{384.16}{1.0349} \approx 371.2$$

To ensure statistical power and account for non-response or incomplete forms, a final adjusted sample size of 430 was selected.

RESULTS

The study comprised 430 participants, including 241 women (56%) and 189 men (44%). The median age of participants was 21 years (interquartile range [IQR]: 20–23 years). The sample was evenly distributed between private (n = 215, 50%) and public (n = 215, 50%) institutions. The distribution across study years was as follows: first year (n = 78, 18%), second year (n = 82, 19%), third year (n = 82, 19%), fourth year (n = 112, 26%), and fifth year (n = 76, 17%). (Table 1)

Table 1: Demographic Characteristics of Participants

Characteristic	N = 430 (%)
Gender	
Female	241 (56%)
Male	189 (44%)
Age	21 (20, 23)
Institute	
Private	215 (50%)
Public	215 (50%)
Year of Study	
1st	78 (18%)
2nd	82 (19%)
3rd	82 (19%)
4th	112 (26%)
5th	76 (17%)

n (%); Median (IQR)

Of all participants, 280 (65.1%) were familiar with the term “impostor syndrome,” while 115 (34.9%) were not. The median Clance Impostor Phenomenon (CIP) score was 61 (IQR: 51–71), with scores ranging from 20 to 97. According to CIP classification, 393 participants (91.3%) had characteristics consistent with impostor syndrome. Specifically, 37 participants (8.7%) had mild or no features, 176 (40.9%) had moderate features, 172 (40%) had frequent features, and 45 (10.5%) had severe impostor syndrome. (Table 2)

Table 2: Knowledge and Prevalence of Impostor Syndrome (N = 430)

Characteristic	Overall (N=430)
Do you know about impostor syndrome?	
Yes	280 (65.1%)
No	115 (34.9%)
CIP Score	
Median (IQR)	61 (51, 71)
Range	20.0 - 97.0
having impostor Syndrome	
Yes	393 (91.3%)
No	37 (8.7%)
CIP Classification	
Mild or no characteristics	37 (8.7%)
Moderate	176 (40.9%)
Frequent	172 (40.0%)
Severe	45 (10.5%)

Among private medical school students, 196 (91.2%) reported experiencing impostor syndrome, compared to 198 (91.4%) in public medical schools. Only 37 students (8.7%) across both institution types did not exhibit impostor characteristics. The chi-square test ($\div^2$ = 0.00155, p = 0.969) indicated no significant difference in the prevalence of impostor syndrome between public and private medical school students. The relative risk (0.999; 95% CI: 0.949–1.05) and odds ratio (0.988; 95% CI: 0.547–1.79) indicated similar probabilities of experiencing impostor syndrome among students in both institution types. Additionally, the contingency coefficient, phi-coefficient, and Cramer’s V were each 0.00167, indicating a negligible association between impostor syndrome and institution type. (Table 3)

Gender-based comparisons showed that a greater proportion of females reported impostor characteristics (n = 228, 58.0%) compared to males (n = 165, 42.0%), a statistically significant difference (p = 0.0141). Among those who did not exhibit impostor characteristics, males represented a higher proportion (22/37; 60.4%) compared to females (15/37; 39.6%). Institution type (p = 0.9691), year of study (p = 0.1681), age (p = 0.4272), and prior awareness of impostor syndrome (p = 0.4761) had no significant association with impostor characteristics. Across all study groups, the mean participant age was 21.4 years (SD = 1.9). (Table 4)

Analysis of impostor syndrome severity by gender showed that females were predominantly represented in the moderate (n = 93, 52.7%) and frequent (n = 105, 61.1%) categories, whereas males were more often represented in the mild or none (n = 23,WHY IS

Table 3: Contingency Table for Impostor Syndrome by Institute

Institute	Having Impostor Syndrome (Yes)	Having Impostor Syndrome (No)	Total	÷² Test	Comparative Measures	Nominal Association Measures
Private	196 (49.7%)	19 (50.0%)	215 (49.7%)	÷² = 0.00155	Odds Ratio: 0.988	Contingency Coefficient: 0.00167
Public	198 (50.3%)	17 (50.0%)	215 (50.3%)	df = 1	95% CI: 0.547, 1.79	Phi-Coefficient: 0.00167
Total	393 (91.3%)	37 (8.7%)	430 (100%)	p = 0.969	Relative Risk: 0.999	Cramer's V: 0.00167

Table 4: Characteristics of Participants with and without Impostor Syndrome

Characteristic	Yes (N=393)	No (N=37)	Total (N=430)	p value
Institute				
Private	196.0 (49.7%)	19.0 (50%)	215.0 (49.7%)	0.969*
Public	198.0 (50.3%)	17.0 (50%)	215.0 (50.3%)	
Gender				
Female	228.0 (58.0%)	15.0 (39.6%)	243.0 (56.4%)	0.014*
Male	165.0 (42.0%)	22.0 (60.4%)	187.0 (43.6%)	
Year of study				
1st	70.0 (18.4%)	5.0 (12.5%)	77.0 (17.9%)	0.168*
2nd	76.0 (19.4%)	7.0 (18.8%)	82.0 (19.3%)	
3rd	80.0 (20.2%)	4.0 (10.4%)	84.0 (19.3%)	
4th	100.0 (25.5%)	11.0 (31.2%)	111.0 (26.0%)	
5th	65.0 (16.4%)	10.0 (27.1%)	75.0 (17.4%)	
Age				
Mean (SD)	21.4 (1.9)	21.6 (1.7)	21.4 (1.9)	0.427**
Range	16.0 - 39.0	19.0 - 24.0	16.0 - 39.0	
Do you know about impostor syndrome?				
Yes	257.0 (65.5%)	22.0 (60.4%)	280.0 (65.1%)	0.476*
No	136.0 (34.5%)	15.0 (39.6%)	150.0 (34.9%)	

** Pearson's Chi-squared test ** Linear Model ANOVA*

THERE A DIFFERENCE? STATES 22 ABOVE. 60.4%) and severe (n = 15, 32.8%) categories. No statistically significant differences were found between institution type (p = 0.7661), year of study (p = 0.2041), age (p = 0.0652), or awareness of impostor syndrome (p = 0.3051). The mean age remained approximately 21.4 years (SD = 1.9) across all severity levels. However, participants who were aware of impostor syndrome were more frequently represented in the severe category (n = 34, 75.9%) compared to those who were unaware (n = 11, 24.1%). (Table 5)

DISCUSSION

Impostor syndrome is a mental state in which a person often doubts their abilities, even when it is clear that they are competent in what they do. This study aimed to investigate how impostor syndrome manifests in students of public and private medical schools. The severity of impostor syndrome was categorized according to the CIP score: a mild score of 40 or less indicated that students hardly ever felt like an impostor; a moderate score between 41 and 60 reflected occasional impostor feelings; scores between 61 and 80 indicated frequent feelings; and a severe score of 80 or above suggested that students nearly always experienced these feelings[8].

Table 5: Severity of Impostor Syndrome by Demographic Characteristics

Variables	Mild or no Characteristics (N=37)	Moderate (N=176)	Frequent (N=172)	Severe (N=45)	Total (N=430)	p-value
Institute						
Private	18.0 (50%)	90.0 (50.4%)	87.0 (50.7%)	19.0 (43.1%)	213.0 (49.7%)	0.766*
Public	19.0 (50%)	86.0 (49.6%)	85.0 (49.3%)	26.0 (56.9%)	217.0 (50.3%)	
Gender						
Female	14.0 (39.6%)	93.0 (52.7%)	105.0 (61.1%)	30.0 (67.2%)	242.0 (56.4%)	0.009*
Male	23.0 (60.4%)	83.0 (47.3%)	67.0 (38.9%)	15.0 (32.8%)	188.0 (43.6%)	
Year of study						
1st	5.0 (12.5%)	30.0 (16.8%)	34.0 (19.9%)	9.0 (19.0%)	77.0 (17.9%)	0.204*
2nd	7.0 (18.8%)	28.0 (15.9%)	35.0 (20.4%)	13.0 (29.3%)	83.0 (19.3%)	
3rd	3.0 (10.4%)	37.0 (21.2%)	37.0 (21.3%)	5.0 (12.1%)	85.0 (19.3%)	
4th	12.0 (31.2%)	48.0 (27.0%)	42.0 (24.4%)	11.0 (24.1%)	111.0 (26.0%)	
5th	10.0 (27.1%)	33.0 (19.0%)	24.0 (14.0%)	7.0 (15.5%)	74.0 (17.4%)	
Age						
Mean (SD)	21.6 (1.7)	21.6 (1.7)	21.3 (2.2)	21.0 (1.7)	21.4 (1.9)	0.065**
Range	19.0 - 24.0	18.0 - 30.0	16.0 - 39.0	18.0 - 24.0	16.0 - 39.0	
Do you know about impostor syndrome?						
Yes	22.0 (60.4%)	113.0 (63.7%)	111.0 (64.7%)	34.0 (75.9%)	280.0 (65.1%)	0.305*
No	15.0 (39.6%)	63.0 (36.3%)	61.0 (35.3%)	11.0 (24.1%)	150.0 (34.9%)	

** Pearson's Chi-squared test ** Linear Model ANOVA*

Although we hypothesized that the prevalence of impostor feelings would differ between students of public and private medical schools, our study found no significant difference. This may suggest that students in both types of institutions encounter similar academic stressors, rigorous exams, and structured curricula—factors that can contribute to feelings of impostrism. The prevalence of our study (91.3%) align with previous findings from the Middle East (45.2%)[9], India (56.7%)[10], Saudi Arabia (42%)[11], and Pakistan (62.65%)[12], showing that impostor feelings are common among medical students worldwide and highlighting the need for better support in these settings.

Our study found that more female students (58%) experienced impostor syndrome symptoms, a trend that was not observed in the Nigerian study[13] or other research reporting no significant gender-based disparities[14]. However, our findings are consistent with previous research, including a study from the United States, which reported a higher prevalence of impostor feelings among female students[15], and a study from Pakistan, where 53.5% of females were found to have impostor syndrome[16]. This disparity could be explained by internalized feelings of inadequacy, fear of failure, and a tendency among female students to compare themselves to high-achieving peers, all of which may exacerbate impostor syndrome symptoms[17].

Furthermore, the highest prevalence of impostor syndrome was observed among fourth-year students, differing from prior studies that reported peaks in the first or third year[18]. The transitional change from pre-clinical to clinical training in the fourth year could explain why this period is particularly challenging.

This study has several limitations. Its cross-sectional design prevents determination of causality or tracking changes over time. The use of self-reported data may be influenced by recall bias or social desirability. Additionally, recruitment via LinkedIn and WhatsApp may have excluded students less familiar with technology, introducing selection bias. Despite these limitations, the study provides valuable insight into how many medical students in Pakistan experience impostor feelings, irrespective of gender, year of study, or type of institution. These findings highlight the importance of identifying and addressing impostor syndrome as part of medical student mental health care.

CONCLUSIONS

This cross-sectional study observed no statistically significant difference in the prevalence of impostor syndrome among students from public and private medical schools. The data show that feelings of inadequacy and self-doubt are common in both educational settings, demonstrating that these experiences are influenced by the inherent challenges of medical training rather than the type of institution. Addressing impostor syndrome as a common challenge among medical students highlights the importance of implementing supportive interventions in all medical institutions. Mentorship programs, peer support networks, and mental health counseling services all assist students in boosting their confidence and mental well-being. Future longitudinal and qualitative studies are needed to better understand the contributing factors, coping mechanisms, and long-term effects of impostor syndrome in medical education.

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All authors approved the final manuscript.

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