

Imposter Feelings among Medical Students During Medical Education

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Abstract: Impostor syndrome is a prevalent and neglected mental health problem in the area of medical education, as it manifests through the development of self-doubt and inability to internalize performance even when competent. Though it is widely researched in the Western context, it has not been properly explored in Pakistan, where the cultures and academic pressure can increase its impacts. The current research evaluated the prevalence, the levels of the severity, and the predictors of impostor syndrome among medical students in Punjab, Pakistan. A cross-sectional study was done on 600 medical students (aged 18–25 years) in public (n=300) and private (n=300) colleges in Punjab who were selected using multi-stage stratified random sampling. Data were collected using the Impostor Syndrome Scale (ISS) and the Burnout Scale for Medical Students (BSMS). The findings revealed that 64.5% of students had experienced impostor syndrome, of which 51.2% had mild, 38.8% moderate, 8.3% severe, and 1.8% intense levels of the syndrome. The neural networks were analyzed and the findings indicated that the best predictor of impostor syndrome was the percentage of academic performance (marks). Part-time employment and year of study had significant effects and income, gender and residential status were of moderate effects in the case of impostor syndrome. These results indicate that the rates of impostor syndrome are high among Pakistani medical students, and such results can be used to outline the necessity of applying certain psychological, academic, and institutional interventions to make sure that health and professional sustainability are promoted among future medical practitioners.

Keywords: Impostor Syndrome, Medical Students, Neural Network Analysis, Pakistan

Introduction

The impostor syndrome, or Impostor Syndrome (IPS), is a feeling of self-doubt and intellectual fraudulence that is incessantly experienced in spite of evident capability and success. Individuals of IPS usually explain success through the circumstances like chance, time or overestimation of their capacities by other people. They are constantly afraid of being discovered as a fraud even when they are doing well in an objective sense (Clance & Imes, 1978; Kollárik & Sollárová, 2021; Neufeld et al., 2023; Huecker et al., 2025). The common ones include anxiety, self-doubt, mood loss, and a lack of confidence that can impair motivation and professional growth. IPS is not officially listed in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5-TR) or International Classification of Diseases (ICD-11), however, it is commonly known as a major psychological experience among high-achieving individuals in several different areas (Bravata et al., 2020; Price et al., 2024).

The feelings of impostor are especially common in medical education. Medical students are under high academic pressure, are exposed to the clinical world at an early age and are constantly tested, and these aspects can all contribute to a sense of incompetence. The rivalry and the necessity to excel in all life fields, academics, and clinical in particular, can make students doubt their ability even when they are performing well objectively (Alrayyes et al., 2022; Mirabal et al., 2024). These emotions may cause stress, self-criticism, and low self-esteem, which may become barriers to learning and professional growth.

According to the recent studies, IPS is quite prevalent among medical students around the world with the prevalence rates of 64.8, 63.5, and 60.3 in Pakistan, the United States, and Malaysia respectively (Meghji et al., 2025). There are also gender differences and female students have a higher rate of reported impostor tendencies (Kristoffersson et al., 2024; Wrench et al., 2024). The cultural and contextual issues are also important, e.g., the high status of hierarchy of medical education system and family-related

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expectations in South Asia possibly contribute to heightened self-doubt and fear of not doing well in a medical trainee (Memon et al., 2025; Mashhadi et al., 2024).

Moreover, the quick development of the medical knowledge contributes to these problems. During 1950, medical knowledge doubled about after 50 years, 3.5 years in 2010, and only 73 days in 2020 (Densen, 2011). This rapid growth requires students to constantly revise what they know and in many cases at the cost of their own well-being. This means that a significant number of medical students face chronic stress and perfectionism as well as emotional exhaustion, which are strongly linked with impostor tendencies (Sheveleva et al., 2023; Meghji et al., 2025; Türkel et al., 2025; Goswami & Baksi, 2025).

Although there is an increased international body of research, there is a lack of empirical studies on prevalence and severity of impostor syndrome among medical students in Pakistan. It is also essential to understand its extent in the context of this particular cultural and educational environment to develop interventions aimed to help students achieve psychological well-being and academic success. Therefore, the present study aims to examine the prevalence and severity of impostor syndrome among medical students in Punjab, Pakistan.

Objective of the Study

1. To find the prevalence and severity levels of Impostor Syndrome among medical students in Punjab, Pakistan
2. To determine the predictive strength of demographic variables in Impostor Syndrome.

Methodology

Research Design: A cross-sectional research design was used to investigate the prevalence of impostor syndrome among medical students in Punjab, Pakistan. This design was appropriate in measuring the incidence and prevalence of impostor feelings in a specified population at one point in time (Creswell & Creswell, 2018)

Target Population: The study population was undergraduate medical students of both public and private medical colleges in Punjab, Pakistan.

Sampling Technique: Multi-stage stratified sampling was applied to draw a representative and balanced sample. A total of four public and four private medical colleges were chosen in the first stage from the four major cities of Punjab. Names of colleges and cities were kept confidential. At the second stage, academic year (1st year–5th year) and gender (male/female) stratification were used to select students. Participants from each stratum was then randomly chosen to obtain a representative sample to reduce sampling bias and provide proportional representation.

Sample Size: The participants of the study were 600 medical students between the ages of 18 and 25 years. The sample was also divided (public & private) in terms of the number of medical colleges ($n = 300$ and $n = 300$ respectively). Equal number of respondents were chosen randomly from each of the academic years and from both genders.

Inclusion Criteria and Exclusion Criteria: Participants included medical students aged 18–25 years who were currently enrolled in undergraduate medical programs at selected public and private medical colleges in Punjab. Students with a non-medical prior degree, diagnosed psychological or chronic physical illness, and medication affecting mood or cognition were also excluded.

Measures: The instrument of present study consisted of demographic form and Imposter Syndrome Scale (Ishaq & Kausar, 2025).

Demographic Form: Participants completed a demographic information form that gathered details on their age, gender, academic year, institution type, residence, marks percentage, monthly income, part-time job status, and English language proficiency.

Table 1

Demographic characteristics of participants (N=600)

Variables	f	%
Gender		
Male	300	50.0
Female	300	50.0
Age		
18_21	220	36.7
22_25	380	63.3
Academic Year		
First	120	22.0
Second	120	28.2
Third	120	25.7
Forth	120	12.3
Fifth	120	11.8
Institution		
Public	300	50.0
Private	300	50.0
Residence		
Day schooler	343	57.2
Hostel	257	42.8
Marks Percentages		
High Achievers $\geq 80\%$	130	21.7
Moderate Achievers 70–79%	179	29.8
Low Achievers $\leq 69\%$	178	29.7
Monthly Income		
Below 50,000	95	15.8
51,000 to 75,000	154	25.7
76,000 to 1 lac	218	36.3
Above 1 lac	133	22.2
Part-Time Job		
Yes	341	56.8
No	259	43.2
English proficiency		
Beginner	83	13.8
Elementary	93	15.5
Intermediate	197	32.8
Upper intermediate	91	15.2
Advanced	85	14.2
Proficient	51	8.5

Imposter Syndrome Scale (Ishaq & Kausar, 2025)

The Impostor Syndrome Scale is a 41-item instrument that measures attribution to external factors, negative self-concept, and self-defeating behavior. It includes nine subscales rated on a 5-point Likert scale (1 = Never to 5 = Always). The high scores indicate the higher imposter tendencies and low indicates low imposter tendencies with the score range of 41–205. The scale has shown high levels of reliability ($\alpha = .95$).

Procedure

First of all, approval from the selected medical institutes was obtained. Faculty members and institutional representatives to facilitate participant recruitment during scheduled academic sessions. The data collection was done alongside the faculty members and the institutional representatives to help in recruiting the participants during the scheduled academic meetings. The study aim was well noted to the participants and informed consent was signed in writing before collecting the data. Medical students were provided with individual questionnaires under conditions ensuring anonymity and confidentiality and were encouraged to respond honestly and independently. The researcher remained available throughout the process to address any queries or concerns. The questionnaires were completed on average by 15–20 minutes and included the demographic Information form and Impostor Syndrome Scale. At the conclusion

of the research, the researcher appreciated the time and co-operation of the participants. The gathered data were then analyzed.

Ethical Considerations

Advanced Studies and Research Board of University of Gujrat gave approval. The study was also formally authorized by the respective heads and administrative authorities of the participating medical institutions to go ahead with the study. Data collection was done after all the participants had given informed consent. The questionnaires were given one by one so that there was confidentiality and anonymity and the participants were directed to answer them in an honest and deliberate way. The researcher remained available throughout the process to address any questions or concerns. Upon completion, participants were thanked for their time, cooperation, and valuable contribution to the study.

Statistical Analyses

After data collection, the responses were typed and analyzed using SPSS 29. Demographic variables were summarized on the basis of descriptive statistics (frequencies, percentages, means, and standard deviations) and described the sample characteristics in general. Frequency distributions and cross-tabulations were conducted in order to investigate the prevalence and severity of impostor syndrome amongst medical students. Also, a neural network analysis was used to investigate the predictive power of demographic factors (e.g., gender, academic year, residence, income, and English proficiency) in impostor syndrome. This analysis method was able to identify complicated, non-linear associations between demographic variables and psychological outcomes.

Results

Table 1

Reliability Analysis of the Imposter Syndrome Scale (N=600)

Variable	No. of Items	Cronbach's α
Imposter syndrome scale	41	.93

The Impostor Syndrome Scale ($r = .93$) in Table 1 had excellent internal consistency making it a highly reliable measure of impostor syndrome amongst medical students.

Table 2

Descriptive Statistics of Imposter Syndrome among Medical Students (N=600)

Variables	Mean	SD	Skewness	Kurtosis	Shapiro-Wilk
Imposter syndrome	103.56	35.37	.71	-.06	.00

Note. SD = Standard Deviation. Shapiro-Wilk significance values less than .05 indicate a violation of the normality assumption.

Table 2 represents the descriptive statistics of the Impostor Syndrome Scale. The findings indicated that the average score of medical students was 103.56 (SD = 35.37) which indicated that the impostor tendencies were moderate in the sample. The skew was skewed to the positive slightly (0.71) and platykurtic (-0.06), which means that the normality was slightly violated. The Shapiro Wilk test was significant ($p < .05$) indicating that this variable did not satisfy the condition of normality.

Table 3

Frequencies and Percentages of Imposter Syndrome among Medical Students (N=600)

Imposter Syndrome Status	Ranges	Frequency	Percentage
Non-imposter category	(42-73)	213	35.5%
Having imposter syndrome	(74-210)	387	64.5%

Note. Classification based on score ranges of the Impostor Syndrome Scale (ISS)

Table 3 reveals that 64.5 percent of the medical students were reported to be experiencing impostor syndrome and 35.5 percent are in the non-impostor group meaning that there are high prevalence levels of impostor tendencies in the sample.

Table 4
Severity Levels of Imposter Syndrome Among Medical Students (N=387)

Severity Level	Range	Frequency (n)	Percentage (%)
Mild/occasional impostor feelings	74-105	198	51.2
Moderate/regular impostor feelings	106-147	150	38.8
Severe/frequent impostor feelings	148-179	32	8.3
Intense/pervasive impostor feelings	180-210	7	1.8

Note. Percentages are based on students identified with impostor syndrome. Higher scores indicate greater severity of impostor feelings.

Table 4 demonstrated that, primarily, students with impostor syndrome had mild (51.2%), moderate (38.8%), or severe (8.3%), or intense (1.8%), of impostor feelings.

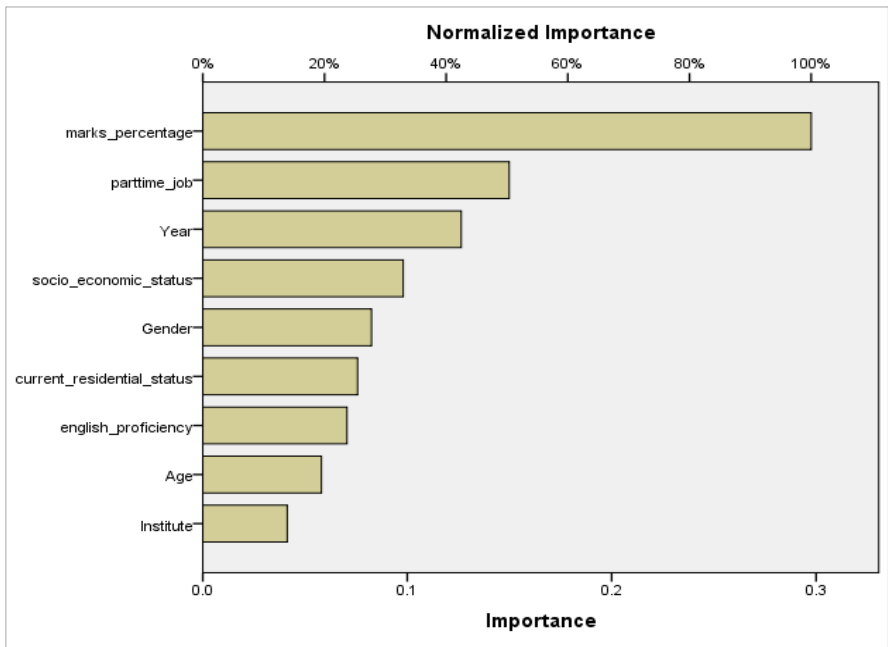
Table 5
Neural Network Analysis of Demographic Variables With Imposter Syndrome Among Medical Students (N=600)

Predictors	Importance	Normalized Importance (%)
Gender	.083	27.7
Age	.058	19.5
Year	.126	42.5
Institute	.041	13.9
Residential status	.076	25.4
Marks Percentage	.298	100.0
Monthly Income	.098	32.9
Part-time Job	.150	50.4
English Proficiency	.071	23.7S

Note. Normalized importance values represent the relative predictive strength of each variable compared to the strongest predictor (marks percentage).

The findings showed that a percentage of marks was the most predictive predictors of impostor syndrome (100%). Others that had significant contributions are part-time job status (50.4%) and academic year (42.5%). Income, gender, and residential status were moderate predictors (32.9, 27.7, and 25.4%). Influence on impostor tendencies was relatively low in English proficiency (23.7) and age (19.5).

Figure 1
Normalized Importace



Discussion

Imposter Syndrome is a prevalent issue in medical education, where feelings of intellectual inadequacy can undermine motivation, performance, and mental health. The present study investigated the frequency, severity levels, and demographic predictors of impostor syndrome (IS) among medical students in Punjab, Pakistan. The prevalence of impostor syndrome in medical students in the current research (64.5) shows that nearly two-thirds of the respondents were affected by impostor feelings meaning that the phenomenon is persistent in a medical education. This percentage is significantly similar to the findings of Mashhadi et al. (2024) who reported that the incidence of impostor syndrome was 62.63 percent among medical and dental students in Islamabad, Rawalpindi, and Lahore, Pakistan. The consistency in the prevalence rates is due to the fact that of academic rigor, systems of competitive grading and social pressures of perfection exist whereby, it is due to these factors that the Pakistani medical setting experiences increased self-doubts. Imposter syndrome has been experienced in international studies in the same ways. In point, Wrench et al. (2024) found out that students of the first year in the field of medicine in the US were prone to impostor syndrome in 61 of the identified cases, which demonstrates the lack of dependence on the culture or geography but the symptom of the general psychological burden of being a medicinal student. Likewise, Jabali et al. (2025) reported high prevalence of over 80% in dental students in Middle East universities, which indicated that health profession students in various regions have comparable psychological stress and perfectionist demands contributing to the development of impostor feelings. Previous cultural studies by Qureshi (2017) and Alzufari et al. (2025) also reported 46.4% to 47.5% ratio of impostor characteristics among medical students which though slightly less than this study is within a similar range of range and is presumably because of differences in scale measures and sample variables. However, these results show that impostor syndrome is a widespread and enduring mental issue in medical learning settings, and the prevalence rates are usually between 50 to 70%. Both national and international studies also provide evidence that the findings of the current study are strong and that the experiences of impostors are universal among medical students.

The severity of the impostor syndrome as showed by the medical students that participated in the present research was as follows: 51.2 percent of sample participants had mild or occasional impostor feelings, 38.8 percent had moderate or regular feelings, and 8.3 percent had severe and 1.8 percent intense or pervasive feelings. These results demonstrate that there is a continuum of the intensity of impostor phenomenon, and most students experience the transient self-doubt but no chronic impostor distress. This trend correlates with Elnaggar et al. (2023), which have emphasized that the majority of medical students experience some recurrent impostor thoughts based on the demands of the studies, and the minority of medical students experience chronic and debilitating impostor thoughts disrupting their performance. The majority of Asian studies, such as those by Vidanapathirana et al. (2024) and Simanjuntak et al. (2025), pointed out that medical trainees had mild and moderate impostor behaviors with a small percentage being severe impostors. It means that situational variables such as the comparison with peers, academic load, and evaluative stress can intensify impostor experiences but do not lead to pathological levels. The present results are also consistent with Zulfuqar and Abbasi (2024) and Fatemah et al. (2024), who observed that about half of Pakistani medical students exhibited mild impostor characteristics, as the feelings of expectations to achieve academic excellence and the fear of failure are inherent to the local educational environment. In Western research, Wrench et al. (2024) similarity recognized that the most significant number of American medical students have experienced low or moderate impostor emotions in the early phases of their academic careers, and these emotions tend to stabilize with the growth of professional identity. Comprehensively, the distribution pattern in this study is consistent with previous studies, which suggests that despite the prevalence of impostor syndrome among medical students, its intensity is usually at manageable levels among a majority of them, with only a few developing chronic and troubling impostor symptoms which may require psychological support or treatment.

The neural network analysis has found that among the demographic and academic predictors, the highest importance of impostor syndrome was identified as the percentage of marks (100%), followed by part-time job (50.4%), academic year (42.5%), and income level (32.9%). Lack of academic success among students showed them to have greater impostor tendencies, indicating that perceived inadequacy and

consistent comparison to high-achieving students lead to imposter feelings. As Afzal et al. (2024) also reported that perceived academic competence had predictor of imposter beliefs in medical students, it can be a cause of academic low performance and chronic self-doubt and fear of failure. On the same note, Mashhadi et al. (2024) and Elnaggar et al. (2023) found that students who had low grades or had inconsistent academic performance tended to have imposter experiences most of the time, which was usually as a result of unrealistic school performance expectations and challenging institutional cultures. The importance of part-time job status as a predictor indicates that students in the academic and financial constraints could have an increased role strain contributing to feelings of inadequacy and self-doubt similar to observations by (Yahya et al., 2025).

The academic year also had an effect on the experiences of impostors with those in the senior years exhibiting more imposter tendencies, probably because of accumulating clinical and assessing pressures as mentioned by Sharma et al. (2023). Besides, the gender (27.7) proved to be a moderate predictor, as female students were more likely to report higher imposter tendencies, which aligns with the results of different research (Bhatti et al., 2023; Siraj & Ali, 2023; Chang & Rawian, 2024) explained that it was caused by sociocultural and gender expectations related to achievement and competence. Residential status, income, and English proficiency also played a minor role, indicating that environmental, linguistic, and socioeconomic influences have a combined effect on imposter experiences in medical education. Altogether, the findings support the idea that imposter syndrome in medical students is a complex factor, which is caused by the complex interaction of academic achievements, social pressure, and context-specific factors associated with the competitive nature of medical education.

Implications

The present study suggests that the healthcare institutions should develop well-being initiatives, such as mentorship, reflective practice, and academic counseling, to help students to reorganize maladaptive self-conceptions connected to imposter syndrome. These interventions would be in a position to encourage student to realistically take whatever he or she accomplishes, deal with ideals of perfectionism, and develop a strength against persistent self-doubt. Additionally, the performance-related anxiety, which is likely to be tied with the feeling of an imposter, may be reduced with the assistance of the language proficiency and academic support programs. It is important to note that psychological safety and reducing the stigma of imposter experiences in medical education may be aided by promoting the culture of regarding the occasional self-doubt as a healthy feature of professional growth, and not as a sign of incompetence.

Conclusion

There were high reported incidences of imposter syndrome among medical students and this indicates that in medical education, many times students start doubting their own achievements and abilities. Marks percentage, part time job and academic year were the strongest predictors found through the analysis of neural networks. Moreover, gender and socioeconomic status influenced it moderately. These findings indicate that academic demands, cultural norms, and available coping resources influence the degree of self-doubt and perceived competence among students. Certain interventions that help build resilience, self-efficacy and institutional support need to be implemented so that the psychological wellness and professional development of students can be improved.

References

- Afzal, S., Zamir, S., & Ali, M. A. (2024). Intricacies of imposter phenomenon, mental well-being, self-compassion, and academic integrity interactions among students: Parallel mediation analysis. *Annals of Human and Social Sciences*, 5(II), 527–542. [https://doi.org/10.35484/ahss.2024\(5-II\)40](https://doi.org/10.35484/ahss.2024(5-II)40)
- Alrayyes, S., Dar, U. F., Alrayes, M., Alghutayghit, A., & Alrayyes, N. (2020). Burnout and imposter syndrome among Saudi young adults: The strings in the puppet show of psychological morbidity. *Saudi Medical Journal*, 41(2), 189–194. <https://doi.org/10.15537/smj.2020.2.24841>
- Alzufari, Z., Makkiyah, R., Alowais, A., Almazrouei, A., Abu Ali, A. K. A., Alnaqbi, A., & Muhammad, J. S. (2024). Prevalence of Imposter Syndrome and its risk factors among University of Sharjah medical students. *Cureus*, 16(3), e57039. <https://doi.org/10.7759/cureus.57039>
- American Psychiatric Association. (2022). *Diagnostic and statistical manual of mental disorders* (5th ed., text rev.; DSM-5-TR). American Psychiatric Publishing.
- Bhatti, S., Rehman, A., & Hassan, M. (2023). Exploring gender differences in impostor syndrome and self-efficacy among Pakistani university students. *Pakistan Journal of Psychological Research*, 38(2), 245–260. <https://doi.org/10.33824/PJPR.2023.38.2.12>
- Bravata, D. M., Watts, S. A., Keefer, A. L., Madhusudhan, D. K., Taylor, K. T., Clark, D. M., Nelson, R. S., Cokley, K. O., & Hagg, H. K. (2020). Prevalence, predictors, and treatment of impostor syndrome: A systematic review. *Journal of General Internal Medicine*, 35(4), 1252–1275. <https://doi.org/10.1007/s11606-019-05364-1>
- Chang, G., & Rawian, R. (2024). Gender differences and similarities in reading motivation from the perspective of social cognitive theory. *World Journal of English Language*, 15(1), 206–215. <https://doi.org/10.5430/wjel.v15n1p206>
- Clance, P. R., & Imes, S. A. (1978). The impostor phenomenon in high achieving women: Dynamics and therapeutic intervention. *Psychotherapy: Theory, Research & Practice*, 15(3), 241–247. <https://doi.org/10.1037/h0086006>
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approach* (5th ed.). SAGE Publications.
- Densen, P. (2011). Challenges and opportunities facing medical education. *Transactions of the American Clinical and Climatological Association*, 122, 48–58. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3116346/>
- Elnaggar, M., Alanazi, T., Alsayer, N. A., Alrawili, M., Alanazi, R., Alghamdi, R., & Alrwili, R. (2023). Prevalence and predictor of impostor phenomenon among medical students at Jouf University, Saudi Arabia. *Cureus*, 15(11), e48866. <https://doi.org/10.7759/cureus.48866>
- Fatemah, M., Bint Amir, H., & Zaheer, R. (2024). Behind the mask: Impostor phenomenon and social anxiety in medical students of Pakistan—A cross-sectional study. *Rawal Medical Journal*, 49(2), 310–316.
- Goswami, A., & Baksi, R. (2025). Perfectionism as a catalyst to anxiety and burnout: A study among students. *The International Journal of Indian Psychology*, 7(1), 1–7. <https://doi.org/10.33545/26648377.2025.v7.i1d.103>
- Huecker, M. R., Shreffler, J., McKeny, P. T., & Davis, D. (2025). Impostor phenomenon. In StatPearls [Internet]. StatPearls Publishing. <https://www.ncbi.nlm.nih.gov/books/NBK585058>
- Hutchins, H. M., & Rainwater, A. J. (2023). Gender, impostor phenomenon, and professional identity development in academia. *Frontiers in Psychology*, 14, 1123456. <https://doi.org/10.3389/fpsyg.2023.1123456>
- Jabali, A. H. (2025). Psychological well-being of medical and dental students in Saudi Arabia post worldwide pandemic: A cross-sectional study. *BMC Medical Education*, 25, Article 1238. <https://doi.org/10.1186/s12909-025-07817-0>
- Kollárik, T., & Sollárová, E. (2021). “They will discover I’m a fraud!” The impostor syndrome among psychology students. *Studia Psychologica*, 63(4), 372–386. <https://doi.org/10.31577/sp.2021.04.831>
- Kristoffersson, E., Boman, J., & Bitar, A. (2024). Impostor phenomenon and its association with resilience in medical education: A questionnaire study among Swedish medical students. *BMC Medical Education*, 24, 782. <https://doi.org/10.1186/s12909-024-05788-2>

- Mashhadi, S. F., Khan, N., Khalid, R. A., Raza, H., Hassan, A. U., & Younas, M. F. (2024, November 6). Prevalence of Imposter Syndrome Among Medical Students of Rawalpindi, Islamabad and Lahore: A Cross-Sectional Study Investigating A Trending and Pragmatic Topic: we no Longer Have to Live in Pluralistic Ignorance. *Pakistan Armed Forces Medical Journal*, 72(SUPPL-4), S864-S868. <https://doi.org/10.51253/pafmj.v72iSUPPL-4.9681>
- Meghji, K. A., Shaikh, U. M., & Hiba, U. (2025). Prevalence of imposter phenomenon in students and its correlation with burnout syndrome: Torn between perfection and exhaustion. *Khyber Medical University Journal*, 17(1), 1-7. <https://doi.org/10.35845/kmu.j.2025.23636>
- Memon, T. F., et al. (2025). Imposter syndrome and its association with burnout and psychological morbidity among undergraduate medical students in Sindh, Pakistan. *Khyber Medical University Journal*, 17(3), 266-272. <https://doi.org/10.35845/kmu.j.2025.23673>
- Mirabal, S. C., Chodoff, A., Wright, S. M., & Levine, R. B. (2024). Breaking the cycle: A qualitative study of factors that mitigate impostor phenomenon among internal medicine residents. *Journal of Graduate Medical Education*, 16(4), 427-435. <https://doi.org/10.4300/JGME-D-23-00499.1>
- Neufeld, A., Babenko, O., Lai, H., Svrcek, C., & Malin, G. (2023). Why do we feel like intellectual frauds? A self-determination theory perspective on the impostor phenomenon in medical students. *Teaching and Learning in Medicine*, 35(2), 180-192. <https://doi.org/10.1080/10401334.2022.2056741>
- Price, P. C., Holcomb, B., & Payne, M. B. (2024). Gender differences in impostor phenomenon: A meta-analytic review. *Current Research in Behavioral Sciences*, 5, 100155. <https://doi.org/10.1016/j.crbeha.2024.100155>
- Qureshi, M. A., Taj, J., Latif, M. Z., Zia, S., Rafique, M., & Chaudhry, M. A. (2017). Imposter Syndrome among Pakistani Medical Students. *Annals of King Edward Medical University*, 23(2). <https://doi.org/10.21649/akemu.v23i2.1647>
- Sharma, S., Kaur, P., & Singh, R. (2023). Gender differences in impostor phenomenon and psychological distress among university students. *International Journal of Indian Psychology*, 11(3), 110-120. <https://doi.org/10.25215/1103.011>
- Sheveleva, M. S., Permyakova, T. M., & Kornienko, D. S. (2023). Perfectionism, the Impostor Phenomenon, Self-Esteem, and Personality Traits among Russian College Students. *Psychology in Russia: State of the Art*, 16(3), 132-148. <https://doi.org/10.11621/pir.2023.0310>
- Simanjuntak, R. S., Amelia, R., Effendy, E., & Yunanda, Y. (2025). Struggling with self-doubt: Impostor phenomenon and mental health among medical students at Universitas Sumatera Utara Medan, Indonesia. *Clinical Practice & Epidemiology in Mental Health*, 21, e17450179397570. <https://doi.org/10.2174/0117450179397570250706100944>
- Siraj, S. A., & Ali, Z. (2023). The influence of social media usage on well-being: Evidence from Pakistani university students. *Pakistan Journal of Law, Analysis and Wisdom*, 2(2), 337-348.
- Türkel, N. N., Başaran, A. S., Gazey, H., & Ekmekçi Ertek, İ. (2025). The imposter phenomenon in psychiatrists: Relationships among compassion fatigue, burnout, and maladaptive perfectionism. *BMC Psychiatry*, 25, 30. <https://doi.org/10.1186/s12888-025-06470-7>
- Vidanapathirana, M., Gomez, D., & Atukorala, I. (2024). Impostor phenomenon and self-reported satisfaction among medical and surgical postgraduate trainees in Sri Lanka. *BMC Medical Education*, 24, Article 1352. <https://doi.org/10.1186/s12909-024-06290-5>
- Wrench, A., Padilla, M., O'Malley, C., & Levy, A. (2024). Impostor phenomenon: Prevalence among 1st year medical students and strategies for mitigation. *Heliyon*, 10(8), e29478. <https://doi.org/10.1016/j.heliyon.2024.e29478>
- Yahya, M., Qayyum, S., & Rasheed, S. (2025). Imposter Phenomenon and Burnout in University Students: Moderating Role of Coping Strategies. *Journal of Professional & Applied Psychology*, 6(2), 119-135. <https://doi.org/10.52053/jpap.v6i2.362>
- Zulfiqar, N., & Abbasi, T. (2024). Mediating role of test anxiety in association between imposter phenomenon and perfectionism among high-achieving students. *Gifted Child Quarterly*, 35(4). <https://doi.org/10.1177/1932202X241281782>