Res Dev Med Educ. 2025;14:33340
doi: 10.34172/rdme.025.33340
https://rdme.tbzmed.ac.ir

Letter to the Editor

The merit paradox: when imposter syndrome and the Dunning-Kruger effect fracture medical competence

Sara Heydari*

Department of Medical Education, Medical Education and Development Center, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

Received: May 13, 2025 **Revised:** May 20, 2025 **Accepted:** May 23, 2025 **epublished:** June 29, 2025

Introduction

Behind medicine's culture of excellence lurks a dangerous paradox: nearly one-third of residents secretly believe they don't belong, while others dangerously overestimate their skills. This cognitive rift—where self-doubt and overconfidence coexist—compromises patient care, erodes mental health, and sabotages medical education. Yet traditional training ignores it.

Imposter syndrome

A top-performing medical student, believes all her successes are just luck:

> "These perfect grades were pure chance... If I make one mistake, they'll finally see I know nothing!"

Imposter syndrome (IS) refers to a persistent psychological state where individuals doubt their accomplishments and fear being exposed as inadequate, despite evident success. Initially identified by Clance and Imes in 1978 among accomplished women, research now suggests approximately 70% of people experience these feelings at some life stage.[1]

Despite possessing advanced degrees, exceptional test scores, and professional recognition from peers and experts, these individuals persistently feel inadequate. The syndrome correlates with perfectionism, is exacerbated by intense self-doubt and anxiety, and thrives in medicine's high-pressure, evaluation-driven environment.[2]

Dunning-Kruger effect

A fifth-year medical student performing poorly in OSCE exams, confidently declares to his peers:

> "The examiners are biased against me! The OSCE time allocation was unfair. I've mastered all these clinical skills!"

Accurate self-assessment proves challenging for learners, particularly among low-performers—a cognitive bias termed the Dunning-Kruger effect. Paradoxically, the least competent individuals often overrate their abilities compared to peers. This has critical implications for medical education, where self-directed learning underpins both formal training and lifelong professional development.[3,4]

Cognitive biases in medical students: Key consequences

These cognitive distortions (IS and the Dunning-Kruger effect) can severely impact learning, clinical performance, and mental health in medical trainees. Below are the most critical consequences:

1. Educational Impacts

Dunning-Kruger students overlook weaknesses due to inflated confidence, avoiding skill improvement. The Dunning-Kruger effect manifests across diverse learning contexts and assessment parameters, impairing decision-making capacity, self-directed learning, and ultimately individual learning curves. This phenomenon is observable in students' self-assessments of both theoretical knowledge and practical clinical skills.[5]

A study that I conducted to investigate and compare the self-efficacy and competence of nursing students in managing patients with blood malignancies in a simulated environment showed the Dunning-Kruger effect as follows: 5th-semester students who had recently completed the hematology course and had less exposure to patients with blood malignancies reported higher self-efficacy scores compared to 8th-semester students, while their competence scores in developing the nursing process were lower.[6]

In another study that I conducted with dental professors to investigate the self-efficacy of dental students in dealing with pathological lesions of the mouth and jaw and related factors at the Yazd School of Dentistry, the results

***Corresponding author:** Sara Heydari, Email: S.heydari.287@gmail.com

indicated that the average self-efficacy scores of 10th-semester students were higher than those of 11th and 12th-semester students, and this could also confirm the Dunning-Kruger effect.[7]

The imposter phenomenon significantly affects the learning process of medical students, creating a sense of inadequate competence and excessive focus on managing professional image, leading to a deviation from learning goals and a decrease in acceptance of constructive feedback.[8]

2. Patient safety

Studies show that the Dunning-Kruger effect among medical students and professionals can lead to overestimation of diagnostic and therapeutic abilities, which directly compromises patient safety. Overconfidence in the early stages of learning reduces acceptance of corrective feedback and increases the risk of medical errors.[9] When people overestimate their skills due to this cognitive bias, may attempt to perform complex treatments that are beyond their professional capabilities. This can lead to medical errors, treatment complications, and ultimately patient safety compromise.[10]

On the other hand, I have repeatedly witnessed that students with IS delay decision-making in emergencies due to a lack of belief in their abilities. They also avoid asking others for help in working teams to hide their incompetence, which endangers patient safety.

3. Psychological and social effects

IS correlates with multiple mental health components including self-esteem, psychological distress, burnout, anxiety, low self-worth, and depression. It jeopardizes job retention, professional performance, and ultimately career advancement among practitioners who persistently question their legitimacy and competence.[11]

Repeated failures and constant justification of their reasons cause discouragement and burnout in students affected by Dunning-Kruger, and over time, they become indifferent to their poor results, leading to academic underperformance.

What to do?

Evidence-based interventions for IS encompass structured feedback from mentors, and peer support groups, mitigation of perfectionist behaviors (over-preparation/procrastination), self-compassion exercises, and strength-based self-reflection.[12] In general, studies show that effectively dealing with the imposter phenomenon in medical education environments requires a combination of individual strategies (cognitive reframing and mindfulness), group supports (interactive workshops and peer networks), and organizational changes (supervisor training and workplace culture reform), which can lead to improved self-efficacy and professional performance.[13] To operationalize these strategies, it is suggested that: (1) periodic workshops with structured self-assessment exercises like "Progress Checklists"; (2) peer mentorship programs pairing senior and junior students; and (3) integrating IS discussions into clinical debriefings. These approaches have shown promise in enhancing student confidence and performance when consistently implemented.

Based on my experiences in managing educational environments and dealing with students, the best approach to implementing a mentoring program includes both student mentoring and mentoring by professors. Academic advisor professors can identify and address students' problems by establishing close relationships with students and providing individual counseling based on their circumstances. Another useful solution is to provide students with constructive feedback and teach them how to reflect. We must help students recognize their true potential and strive for their personal growth and development.

Conclusion

The letter highlights a critical yet often overlooked dichotomy in medical education: the coexistence of IS among high-achieving students and the Dunning-Kruger effect among underperformers, both of which undermine clinical competence and patient safety. While IS drives capable individuals to self-sabotage through chronic self-doubt and avoidance of critical feedback, the Dunning-Kruger effect fuels overconfidence in less competent learners, leading to reckless decision-making and stagnation. These cognitive distortions perpetuate educational inequities, amplify mental health struggles like burnout and anxiety, and jeopardize patient care through delayed interventions or medical errors. Addressing this paradox demands systemic reforms, including mentorship programs, structured feedback mechanisms, and cultural shifts within medical institutions to normalize vulnerability and foster accurate self-assessment. Only by bridging this cognitive rift can medical education cultivate resilient, self-aware practitioners capable of sustaining both their well-being and the integrity of patient care.

Suggested future directions

Moving forward, it is recommended: (1) developing combined interventions for both IS and the Dunning-Kruger effect; (2) implementing AI-based assessment tools for objective competence evaluation; and (3) studying long-term impacts of early interventions in clinical practice. These approaches could significantly enhance both learner development and patient care quality in medical education.

Competing Interests
None declared.

Ethical Approval
Not applicable.

Funding

None.

References

1. Rivera N, Feldman EA, Augustin DA, Caceres W, Gans HA, Blankenburg R. Do I belong here? Confronting IS at an individual, peer, and institutional level in health professionals. MedEdPORTAL. 2021;17:11166. doi: 10.15766/mep_2374-8265.11166.
2. LaDonna KA, Ginsburg S, Watling C. "Rising to the level of your incompetence": what physicians' self-assessment of their performance reveals about the imposter syndrome in medicine. Acad Med. 2018;93(5):763-8. doi: 10.1097/acm.0000000000002046.
3. Rahmani M. Medical trainees and the Dunning-Kruger effect: when they don't know what they don't know. J Grad Med Educ. 2020;12(5):532-4. doi: 10.4300/jgme-d-20-00134.1.
4. Bryan J, Lindsay H. P025: The Dunning-Kruger effect in medical education: double trouble for the learner in difficulty. CJEM. 2017;19(S1):S86. doi: 10.1017/cem.2017.227.
5. Knof H, Berndt M, Shiozawa T. Prevalence of Dunning-Kruger effect in first semester medical students: a correlational study of self-assessment and actual academic performance. BMC Med Educ. 2024;24(1):1210. doi: 10.1186/s12909-024-06121-7.
6. Heydari S, Beigzadeh A. Comparison of Nursing Students' Self-Efficacy and Competence in Managing Patients with Hematological Malignancies in a Simulated Environment; Dunning-Kruger Effect Analysis. 26th Iranian Conference on Health Professions Education; 2025; Tehran, Iran.
7. Tabatabaei SH, Ebrahimi E, Owlia F, Heydari S. Evaluation of the Self-Efficacy of Dental Students in Dealing with Pathological Lesions of the Mouth and Jaw and Related Factors in Yazd Faculty of Dentistry in the Academic Year 2023-2024. Shahid Sadoughi University of Medical Sciences; 2024.
8. Chodoff A, Conyers L, Wright S, Levine R. "I never should have been a doctor": a qualitative study of imposter phenomenon among internal medicine residents. BMC Med Educ. 2023;23(1):57. doi: 10.1186/s12909-022-03982-8.
9. Surdilovic D, Adtani P, Fuoad SA, Abdelaal HM, D'Souza J. Evaluation of the Dunning-Kruger effects among dental students at an academic training institution in UAE. Acta Stomatol Croat. 2022;56(3):299-310. doi: 10.15644/asc56/3/8.
10. Owen CP. The complexity of care and the Dunning-Kruger effect. S Afr Dent J. 2023;78(1):37-41. doi: 10.10520/ejc-sada_v78_n1_a3.
11. Ogunyemi D, Lee T, Ma M, Osuma A, Eghbali M, Bouri N. Improving wellness: defeating Impostor syndrome in medical education using an interactive reflective workshop. PLoS One. 2022;17(8):e0272496. doi: 10.1371/journal.pone.0272496.
12. Shill-Russell C, Russell RC, Daines B, Clement G, Carlson J, Zapata I, et al. Imposter syndrome relation to gender across osteopathic medical schools. Med Sci Educ. 2022;32(1):157-63. doi: 10.1007/s40670-021-01489-3.
13. Siddiqui ZK, Church HR, Jayasuriya R, Boddice T, Tomlinson J. Educational interventions for imposter phenomenon in healthcare: a scoping review. BMC Med Educ. 2024;24(1):43. doi: 10.1186/s12909-023-04984-w.