A systematic review of impostor syndrome in higher education

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Article Info

ABSTRACT

Impostor syndrome is a psychological phenomenon characterized by persistent feelings of inadequacy and self-doubt despite evidence of competence and success. This systematic review aims to explore the prevalence, impact, and factors associated with impostor syndrome among individuals in higher education settings based on recent 6 years' publication in journals (from 2019 to 2024). A comprehensive search of electronic databases was conducted, yielding a total of 37 relevant studies that met the inclusion criteria. The findings suggest that impostor syndrome is a prevalent issue among students and faculty academic staff in higher education, with varying degrees of severity. The syndrome can negatively impact academic performance, career development, and overall well-being. Several factors contribute to the development of impostor syndrome, including gender, minority status, high achievement orientation, and perfectionism. However, further research is needed to better understand the underlying mechanisms and effective strategies for addressing impostor syndrome in higher education.

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1. INTRODUCTION

In recent years, with the increasing awareness of mental health, the psychological phenomenon of impostor syndrome has begun to receive more attention. Impostor syndrome stems from an individual's internal unease, causing them to feel that their success is not based on ability and effort, but on luck or others' misunderstandings [1]–[3]. Although impostor syndrome is a relatively new concept as a professional term in the academic world, it has gradually attracted widespread attention from both the public and the academic community.

Historically, although descriptions of similar symptoms can be traced back to earlier periods, it was not until the 1970s that psychologists Clance and Imes [1] formally defined this concept. Since then, research on impostor syndrome in various fields, including the workplace [4] and education, has gradually increased. Additionally, researchers have developed several applicable scales based on its principles to better understand and quantify this psychological phenomenon [5]–[8].

Based on previous research, scholars have conducted systematic reviews on the prevalence, predictive factors, and treatment [9] of impostor syndrome, as well as its measurement scales [10], providing important insights into the syndrome. However, these studies have not specifically targeted the unique environment of higher education for in-depth analysis. Higher education, as a special social and academic field, with its distinctive competitiveness, achievement orientation, and emphasis on knowledge and academic ability, makes the impact of impostor syndrome in this environment more complex and profound. Therefore, it is necessary to

conduct a systematic review specifically on impostor syndrome in the higher education environment to fill this research gap.

2.   METHOD

To conduct a comprehensive systematic review of impostor syndrome in higher education, a rigorous search strategy was employed to identify relevant studies. The following databases were searched: SpringerLink, Taylor and Francis, MDPI, SAGE, ScienceDirect, Web of Science, Scopus, Google Scholar, PubMed and ResearchGate. These databases were selected to ensure a broad coverage of relevant literature in the fields of psychology, education, and social sciences. Figure 1 shows a PRISMA flow diagram illustrating the systematic screening process for a literature review spanning from 2019 to 2024.

The search strategy incorporated a combination of keywords and controlled vocabulary terms related to impostor syndrome and higher education. The following terms were used: "impostor syndrome", "imposter syndrome", "impostor phenomenon", "imposter phenomenon", "higher education", "postgraduate students", "graduate students", "master students", "PhD students". The search terms were adapted as necessary to align with the specific search functionalities of each database.

The search was limited to studies published in English between January 2019 and 2024. The time restriction was implemented to focus on recent research and to capture the most up-to-date understanding of impostor syndrome in higher education. The data extraction process will involve systematically extracting relevant information from the included studies, including study characteristics, sample characteristics, measurement instruments used, and key findings related to impostor syndrome in higher education. The extracted data was synthesized and analyzed to provide a comprehensive overview of the current state of knowledge on this topic.

3.   RESULTS

This study presents the systematic review results of impostor syndrome in the context of higher education from 2019 to 2024. The research reports covered multiple countries, including the United States, China, the United Kingdom, Canada, Pakistan, Spain, Finland, Russia, Romania, Bangladesh, Saudi Arabia, and Israel, revealing the development trends and patterns of impostor syndrome's influence in different cultural and educational systems.

Out of the 37 studies analyzed, 30 utilized quantitative methods to investigate and analyze the phenomenon of impostor syndrome [11]–[40], providing quantifiable data on the extent of the syndrome's impact, its prevalence, and related factors. Additionally, four studies used mixed methods [41]–[44], combining both quantitative and qualitative data, offering a more comprehensive perspective in understanding impostor syndrome. The remaining three studies adopted qualitative methods [45]–[47], delving into individual experiences, perceptions, and ways of dealing with impostor syndrome as shown in Table 1. The content of this chapter is divided into three parts: impostor syndrome in higher education; predictors of impostor syndrome; and intervention. In each section, the results of studies from various countries are analyzed, exploring the characteristics and impacts of impostor syndrome at different educational levels, across various genders, ages, academic fields, and among marginalized groups.

3.1. Impostor syndrome in higher education

A total of 37 articles were categorized according to educational level: undergraduates [16]–[37], [42]–[44], [46], postgraduate students [11]–[15], [41], [45], and faculty staff [38]–[40], [47]. This categorization provided an in-depth understanding of the prevalence and characteristics of impostor syndrome in these distinct higher education groups. By categorizing the articles this way, we were able to conduct a more detailed analysis of how impostor syndrome affects each group differently. For instance, undergraduates may experience impostor syndrome differently compared to postgraduate students or faculty staff due to varying academic pressures and expectations. This nuanced understanding helps in developing specific interventions and support systems tailored to each group's unique needs.

3.1.1. Impostor syndrome among undergraduate students

The 26 studies focused on impostor syndrome among undergraduates showcase its extensive impact and diversity within this demographic. These studies reveal that impostor syndrome is not only prevalent but also linked to multiple negative psychological states such as anxiety, depression, and low self-esteem. Additionally, the research highlights detrimental behavior patterns associated with impostor syndrome, including procrastination, over-preparation, and reluctance to seek help. By examining these aspects, the studies provide a comprehensive understanding of how impostor syndrome affects undergraduate students, underscoring the need for targeted interventions and support mechanisms. This thorough analysis emphasizes

the importance of addressing impostor syndrome early in academic careers to mitigate long-term negative effects on students' mental health and academic performance.
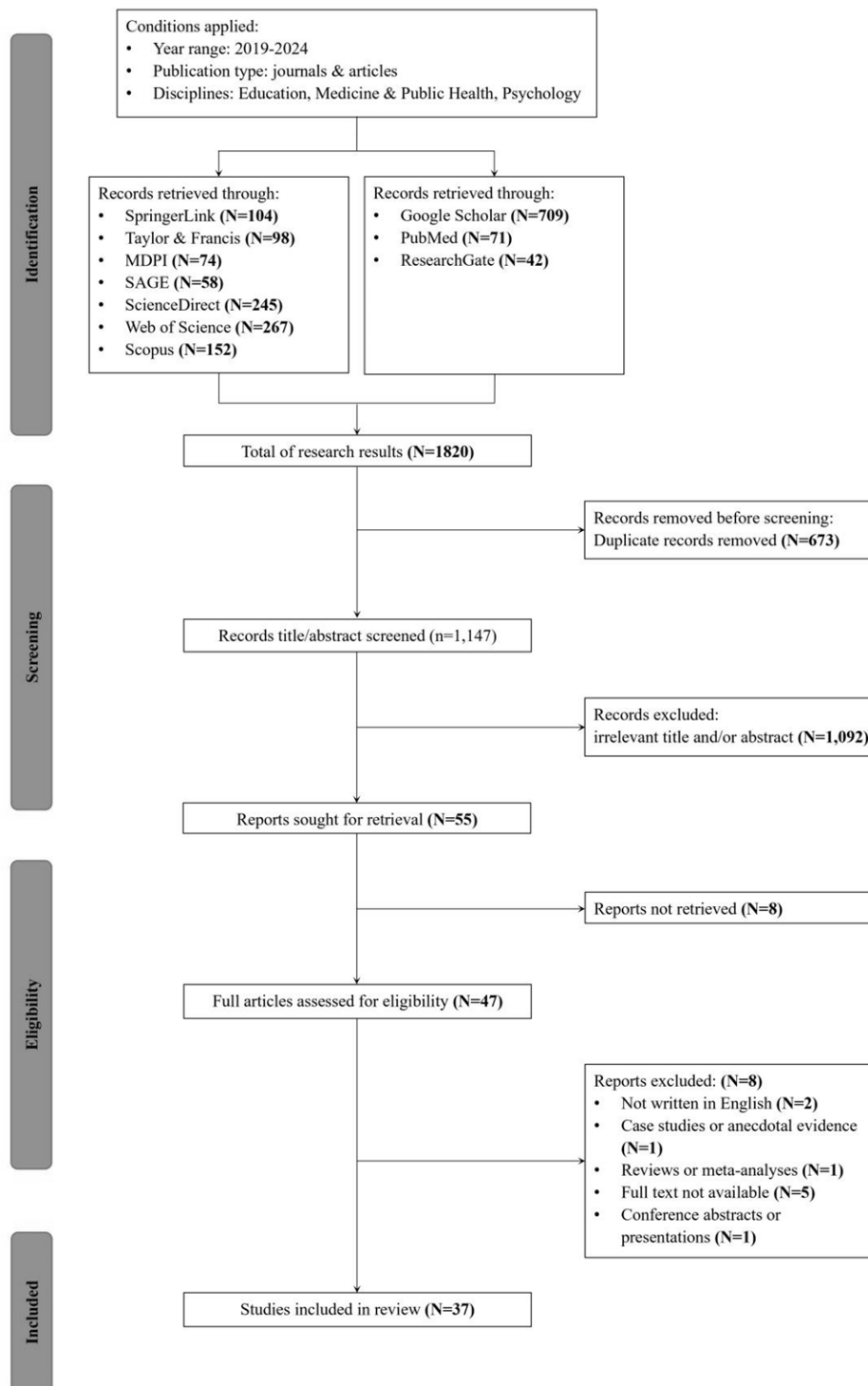

Figure 1. Flow of information through the different phases of a systematic review

The relationship of impostor syndrome with perfectionism and its correlation with depression symptoms have drawn significant attention from researchers. It was discovered that negative perfectionism not only fosters impostor syndrome and depression symptoms but also impostor syndrome emerges as a

significant predictor of depression [16]. Moreover, impostor syndrome plays a vital moderating role in the dynamics between perfectionism and depressive moods [19]. While impostor syndrome is an individual experience, not classified as a mental disorder [48], and the feelings of being an impostor are highly contextual and relational, often as responses to transitional phases and specific groups or individuals [47], a significant positive correlation has been observed between impostor syndrome and suicidal ideation [30]. Similar findings were noted in a study on Chinese undergraduates, revealing that both family and friend support mitigate the predictive effect of impostor syndrome on depressive symptoms, but only family support weakens the link between depressive symptoms and suicidal ideation [35].

Impostor syndrome among undergraduate students is also related to psychological distress and procrastination, thereby exacerbating their anxiety levels [22]. Studies show that the amount of social media usage correlates positively with impostor syndrome scores [25], and socially prescribed levels of perfectionism significantly relate to impostor syndrome and stress [29]. Furthermore, impostor syndrome negatively correlates with self-esteem [31], and research indicates a positive correlation between maternal psychological control and feelings of impostor syndrome [32].

Higher levels of impostor syndrome can mediate the relationship between performance-avoidance and mastery-avoidance goals and psychological distress [36]. Simultaneously, impostor syndrome negatively impacts students' ability to achieve positive academic outcomes in adverse circumstances [38]. However, students with more autonomy and those receiving more support for basic psychological needs in their courses are less likely to experience frequent and severe symptoms of impostor syndrome [34].

3.1.2. Impostor syndrome among postgraduate students

In postgraduate students, especially doctoral students, the occurrence of impostor syndrome is linked to a variety of factors. Research indicates that doctoral students who received less parental encouragement during childhood and adolescence are more prone to experiencing impostor syndrome, particularly when they pursue doctoral education in a 'go-with-the-flow' manner. This increases their feelings of uncertainty, incompetence, and inferiority [11]. Additionally, students with high-quality supervisors and those who feel less isolated are less likely to experience impostor syndrome compared to their peers. Students reporting intense competition for funding are more frequently worried about impostor syndrome. This suggests that impostor syndrome is not only related to psychological and personality factors but is also closely associated with the intimate social relationships students have with their mentors and peers [12].

From an intervention perspective, evaluative support may help alleviate these inaccurate self-assessments. Emotional support from supervisors, peers, and external resources is valuable in mitigating the feelings of impostor syndrome [42]. It was also found that students with minimal to moderate levels of impostor syndrome exhibit lower levels of perfectionism compared to those with strong levels of impostor syndrome. Perfectionism is a significant predictor of impostor syndrome, with students exhibiting lower levels of impostor syndrome typically possessing higher self-efficacy [13]. Finally, full-time students tend to have stronger impostor syndrome responses than part-time students, and those pursuing in-person degrees exhibit stronger impostor syndrome responses than those in blended programs [14]. These findings highlight the impact of the academic environment and mode of education on the experience of impostor syndrome.

3.1.3. Impostor syndrome among academic staff

Research on impostor syndrome in faculty academic staff reveals various factors and impacts behind it. Thematic interview analyses suggest that impostor syndrome experienced by faculty academic staff may be associated with peer comparison, faculty evaluations, public recognition, fear of unknown expectations, and perceived lack of competence [46]. Additionally, studies have found a significant positive correlation between impostor syndrome and work-family conflict [40], indicating that conflicts between work and family roles may exacerbate impostor syndrome experiences in faculty members. Faculty with higher levels of impostor syndrome also show lower resilience and job satisfaction [41], further emphasizing the negative impact of impostor syndrome on individual professional life and psychological well-being. These studies indicate that impostor syndrome is a complex psychological phenomenon with profound effects on the work performance and emotional state of academic staff.

3.2. Predictors of impostor syndrome

When examining the origins of impostor syndrome, researchers have identified various potential influencing factors. The following section will delve into four key predictive factors: the Gender Effect, the Age Effect, the Field of Study Effect, and the Marginalization Effect. These factors encompass a range of dimensions that are crucial in understanding the manifestation and intensity of impostor syndrome across different groups.

3.2.1. Gender

Although some studies have not found significant gender-based differences in tendencies towards impostor syndrome [11], [13], [22], [24], [27], [39], in those that did identify gender disparities, all indicated that female experience higher levels of impostor syndrome than male [14], [15], [17], [18], [20], [23], [28], [42], [43]. Research highlights that compared to male, female aged between 26 to 35, those who are unmarried or not in a stable relationship, and students who are the first in their family to attend postgraduate school feel the impostor phenomenon more frequently and intensely [14]. Additionally, female score higher on average in both impostor syndrome and perfectionism than male. The tendency of female to experience impostor syndrome is not solely linked to a tendency towards perfectionism [17]. Moreover, female are 1.7 times more likely to report frequent or intense feelings of impostor syndrome compared to male [28], and this may largely be influenced by increased societal pressures [42].

3.2.2. Age

In studies examining the impact of age on impostor syndrome, a variety of findings have been reported, though not all show a significant correlation. While three studies found no statistically significant relationship between student age and impostor syndrome [11], [22], [24], other research points to differing patterns. One study observed that first-year students experience impostor syndrome more frequently than second-year students [23]. Another found that older individuals, those with higher levels of education and professional status, and members of the Nutrition and Dietetics Association, are likely to have lower impostor syndrome scores [25]. Interestingly, respondents between the ages of 22 and 25 are more prone to impostor syndrome than younger individuals [26]. A significant increase in impostor syndrome scores was also noted among third-year students [27], and in another study, second-year students reported higher impostor syndrome scores than their peers in the first and third years [44]. These varied findings suggest a nuanced and complex relationship between age and impostor syndrome, underscoring how different stages of academic and professional life, as well as community involvement, can influence the experience of impostor feelings.

3.2.3. Field of study

Impostor syndrome manifests differently across various academic disciplines. In data science, students are known to experience impostor syndrome [13], a field where the rapid evolution of technology can often leave individuals feeling outpaced and doubting their abilities. This phenomenon is even more pronounced in computer science, where the prevalence of impostor syndrome is notably higher compared to students in other disciplines [15]. The constant advancements and the highly technical nature of the field can lead to a persistent sense of not measuring up. In the realms of medicine and research, the experience of impostor syndrome is intimately tied to the challenges of building identities as doctors and scientists, as these fields are seen as culturally elite and distinct [45]. This elevation creates a high-pressure environment where even accomplished individuals might feel fraudulent.

Furthermore, in comparison to the general adult population, business administration doctoral students display elevated levels of depression and anxiety, and impostor syndrome is similarly prevalent among them [41]. The competitive and demanding nature of doctoral studies in management might contribute to this heightened sense of inadequacy. Within the STEM fields, teachers, doctoral students, and postdoctoral researchers share common experiences of impostor syndrome [47], reflecting the intense competition and the high standards of achievement that characterize these areas, often leading to a shared sense of self-doubt among even the most qualified individuals.

3.2.4. Marginalization effect

While some studies have found no significant differences in impostor syndrome across gender and race [13], [15], other research indicates a more pronounced presence of impostor syndrome among minority groups [27], as their minority status can shape the experience of impostor syndrome [45]. The positive correlation between impostor feelings and psychological distress is partly mediated by interpersonal shame, such as negative perceptions by others or embarrassment from family members due to perceived flaws [21]. Research also suggests that African American students exhibit higher levels of vulnerability, exacerbating the effects of the impostor syndrome [36]. This heightened vulnerability among minority groups may stem from the additional pressures and challenges they face, both in academic environments and in broader social contexts, which can intensify feelings of inadequacy and the fear of being exposed as a fraud.

3.3. Intervention

The included studies delve into various interventions for impostor syndrome, highlighting that emotional support from teachers, classmates, and external resources is particularly valuable [41].

Additionally, it is beneficial to rank performance against a standard, instead of comparing with other students, to reduce competitive pressures [42]. In terms of raising awareness, effectively educating students about impostor syndrome and focusing on enhancing their skills to manage it is crucial, although changing the impostor syndrome experience might not be feasible in the short term through brief interventions [43]. Furthermore, addressing the root causes of impostor feelings necessitates fundamental changes in higher education. As underscored in discussions by anti-racism, decolonization, and abolitionist scholars, universities inherently possess an exclusivity that cannot be adequately addressed by mere reform or by simply increasing the representation of marginalized groups [46]. For teachers, strengthening resilience is suggested as a way to mitigate IP and improve job satisfaction [40]. These strategies collectively suggest that tackling impostor syndrome requires a comprehensive approach, combining both individual-focused interventions and broader systemic changes.

Table 1. Research methodology of the included literature

Quantitative	Mixed-method	Qualitative
Nori and Vanttaja [11]	Pervez et al. [41]	Chakraverty et al. [45]
Cohen and McConnell [12]	Franchi a and Russell-Sewell [42]	Meadhbh Murray et al. [46]
Duncan et al. [13]	Chang et al. [43]	Chakraverty [47]
Sims and Cassidy [14]	Gibson and Lockwood [44]	
Rosenstein et al. [15]		
Liu et al. [16]		
Pákozdy et al. [17]		
Domínguez-Soto et al. [18]		
Wang et al. [19]		
Levant et al. [20]		
Wei et al. [21]		
Maftei et al. [22]		
Khalid et al. [23]		
Khan and Khan [24]		
Landry et al. [25]		
Shahjalal et al. [26]		
Awinashe et al. [27]		
Rice et al. [28]		
Holden et al. [29]		
Brennan-Wydra et al. [30]		
Schubert and Bowker [31]		
Yaffe [32]		
Stone-Sabali et al. [33]		
Neufeld [34]		
Wei et al. [35]		
Yang et al. [36]		
Wu et al. [37]		
Boyle et al. [38]		
Shreffler et al. [39]		
Macias-Moriarity et al. [40]		

4.   DISCUSSION

This study aims to explore the trends and impacts of impostor syndrome in higher education between 2019 and 2024. By conducting a systematic review of research over the past five years, we have gained deeper insight into how different student groups are affected by impostor syndrome and related factors. The results indicate that impostor syndrome is prevalent among students and is closely linked to academic pressure and social anxiety. This form of self-doubt is particularly common in higher education settings, where students often worry about underperforming or failing to be accepted by their peers. Such anxiety, combined with irrational doubts about their own academic achievements, can create a vicious cycle. Fear of exposing their perceived "flaws" increases anxiety in social situations, which in turn reinforces their doubts about their own abilities [48], [49].

Impostor syndrome affects both male and female students. Although some research shows no significant difference in the effects of impostor syndrome in higher education across gender, most studies reveal that impostor syndrome has a more noticeable impact on women [42], [43]. In fact, females are 1.7 times more likely to report frequent or intense impostor syndrome than males [28], which is largely influenced by increased societal pressure [42]. Despite growing global awareness of gender equality, many societies and cultural environments continue to exhibit patriarchal traits, manifesting differently across regions and nations but being pervasive in political, economic, and socio-cultural spheres [50]. Females often lack confidence and self-esteem in the workplace, find it difficult to accept praise, and tend to rate their own performance lower than their male colleagues, which are key symptoms of impostor syndrome [51].

This study is consistent with the views on the association between impostor syndrome and field of study. In academic study related to STEM in higher education, impostor syndrome is even more pronounced among students, likely due to the heightened competition and professional expectations in these disciplines [47]. This reflects the intense competition and high achievement standards often lead even the most qualified individuals to share a common sense of self-doubt.

Interestingly, some studies have suggested interventions to address impostor syndrome in different groups. For instance, reducing comparisons among students has been shown to effectively alleviate impostor syndrome [42]. Increasing students' awareness and management skills around the syndrome is also crucial [43]. For marginalized and minority groups, simple reforms or increased representation are insufficient to solve the problem [46]. Instead, more practical approaches are needed to help policymakers and educators develop interventions that suit students' backgrounds and needs.

5. CONCLUSION

This systematic review has concluded a few key areas for future research. First, there is a need to further investigate the manifestation of impostor syndrome across different cultural backgrounds and genders and its correlation with academic performance and mental health. Second, exploring effective intervention strategies will offer more tailored support to various student groups. Understanding and addressing impostor syndrome is crucial for enhancing overall student well-being and academic performance. A comprehensive understanding of the complex presentation of impostor syndrome among student groups, along with developing effective interventions, will help reduce academic pressure and social anxiety and create a more inclusive and supportive higher education environment. Policymakers, educators, and researchers should collaborate to integrate various data and recommendations, driving broader educational reforms to foster a campus atmosphere conducive to growth and success for all students.

REFERENCES

[1] P. R. Clance and S. A. Imes, "The imposter phenomenon in high achieving women: Dynamics and therapeutic intervention.," *Psychotherapy: Theory, Research & Practice*, vol. 15, no. 3, pp. 241–247, 1978, doi: 10.1037/h0086006.

[2] J. C. Harvey and C. Katz, *If I'm so successful, why do I feel like a fake?: the impostor phenomenon*. New York: St Martin's Press, 1985.

[3] G. Matthews and P. R. Clance, "Treatment of the impostor phenomenon in psychotherapy clients," *Psychotherapy in Private Practice*, vol. 3, no. 1, pp. 71–81, Feb. 1985, doi: 10.1300/J294v03n01_09.

[4] J. Haar and K. de Jong, "Imposter phenomenon and employee mental health: what role do organizations play?" *Personnel Review*, vol. 53, no. 1, pp. 211–227, Jan. 2024, doi: 10.1108/PR-01-2022-0030.

[5] J. C. Harvey, "The impostor phenomenon and achievement: a failure to internalize success," Unpublished Doctoral Dissertation, Temple University, 1981.

[6] P. R. Clance, *The Impostor Phenomenon: Overcoming the Fear That Haunts Your Success*. Atlanta: Peachtree Pub Ltd, 1985.

[7] J. Kolligian Jr. and R. J. Sternberg, "Perceived Fraudulence in Young Adults: Is There an 'Imposter Syndrome'?" *Journal of Personality Assessment*, vol. 56, no. 2, pp. 308–326, Apr. 1991, doi: 10.1207/s15327752jpa5602_10.

[8] M. R. Leary, K. M. Patton, A. E. Orlando, and W. Wagoner Funk, "The Impostor Phenomenon: Self-Perceptions, Reflected Appraisals, and Interpersonal Strategies," *Journal of Personality*, vol. 68, no. 4, pp. 725–756, Aug. 2000, doi: 10.1111/1467-6494.00114.

[9] D. M. Bravata et al., "Prevalence, Predictors, and Treatment of Impostor Syndrome: a Systematic Review," *Journal of General Internal Medicine*, vol. 35, no. 4, pp. 1252–1275, Apr. 2020, doi: 10.1007/s11606-019-05364-1.

[10] K. K. L. Mak, S. Kleitman, and M. J. Abbott, "Impostor Phenomenon Measurement Scales: A Systematic Review," *Frontiers in Psychology*, vol. 10, p. 671, Apr. 2019, doi: 10.3389/fpsyg.2019.00671.

[11] H. Nori and M. Vanttaja, "Too stupid for PhD? Doctoral impostor syndrome among Finnish PhD students," *Higher Education*, vol. 86, no. 3, pp. 675–691, Sep. 2023, doi: 10.1007/s10734-022-00921-w.

[12] E. D. Cohen and W. R. McConnell, "Fear of Fraudulence: Graduate School Program Environments and the Impostor Phenomenon," *The Sociological Quarterly*, vol. 60, no. 3, pp. 457–478, Jul. 2019, doi: 10.1080/00380253.2019.1580552.

[13] L. Duncan, G. Taasoobshirazi, A. Vaudreuil, J. S. Kota, and S. Sneha, "An Evaluation of Impostor Phenomenon in Data Science Students," *International Journal of Environmental Research and Public Health*, vol. 20, no. 5, p. 4115, Feb. 2023, doi: 10.3390/ijerph20054115.

[14] W. L. Sims and J. W. Cassidy, "Impostor Feelings of Music Education Graduate Students," *Journal of Research in Music Education*, vol. 68, no. 3, pp. 249–263, Oct. 2020, doi: 10.1177/0022429420946899.

[15] A. Rosenstein, A. Raghu, and L. Porter, "Identifying the Prevalence of the Impostor Phenomenon Among Computer Science Students," in *Proceedings of the 51st ACM Technical Symposium on Computer Science Education*, Feb. 2020, pp. 30–36, doi: 10.1145/3328778.3366815.

[16] L. Liu, Y. Han, Z. Lu, C. Cao, and W. Wang, "The relationship between perfectionism and depressive symptoms among Chinese college students: The mediating roles of self-compassion and impostor syndrome," *Current Psychology*, vol. 42, no. 22, pp. 18823–18831, Aug. 2023, doi: 10.1007/s12144-022-03036-8.

[17] C. Pákozdy et al., "The imposter phenomenon and its relationship with self-efficacy, perfectionism and happiness in university students," *Current Psychology*, vol. 43, no. 6, pp. 5153–5162, Feb. 2024, doi: 10.1007/s12144-023-04672-4.

[18] C. Domínguez-Soto, V. Labajo, and J. Labrador-Fernández, "The relationship between impostor phenomenon and transformational leadership among students in STEM," *Current Psychology*, vol. 42, no. 13, pp. 11195–11206, May 2023, doi: 10.1007/s12144-021-02358-3.

[19] K. T. Wang, M. S. Sheveleva, and T. M. Permyakova, "Imposter syndrome among Russian students: The link between perfectionism and psychological distress," *Personality and Individual Differences*, vol. 143, pp. 1–6, Jun. 2019, doi: 10.1016/j.paid.2019.02.005.

[20] B. Levant, J. A. Villwock, and A. M. Manzardo, "Impostorism in American medical students during early clinical training: gender differences and intercorrelating factors," *International Journal of Medical Education*, vol. 11, pp. 90–96, Apr. 2020, doi: 10.5116/ijme.5e99.7aa2.

[21] M. Wei, S. Liu, S. Y. Ko, C. Wang, and Y. Du, "Impostor Feelings and Psychological Distress Among Asian Americans: Interpersonal Shame and Self-Compassion," *The Counseling Psychologist*, vol. 48, no. 3, pp. 432–458, Apr. 2020, doi: 10.1177/0011000019891992.

[22] A. Maftei, A. Dumitriu, and A. Holman, "'They will discover I'm a fraud!' The Impostor Syndrome Among Psychology Students," *Studia Psychologica*, vol. 63, no. 4, pp. 337–351, Dec. 2021, doi: 10.31577/sp.2021.04.831.

[23] A. Khalid, A. Shahid, and K. Rahim Khan, "Frequency and Severity of Imposter Syndrome among Medical Students of a Private Medical College," *Journal of Shalamar Medical & Dental College - JSHMDC*, vol. 1, no. 2, pp. 3–8, Dec. 2019, doi: 10.53685/jshmdc.v1i2.56.

[24] M. K. Khan and K. R. Khan, "Difference in the Characteristics of Imposter Syndrome in Dental Students of Preclinical and Clinical Phase," *Journal of Shalamar Medical & Dental College - JSHMDC*, vol. 2, no. 1, pp. 39–44, Jun. 2021, doi: 10.53685/jshmdc.v2i1.19.

[25] M. J. Landry, D. A. Bailey, M. Lee, S. Van Gundy, and A. Ervin, "The Impostor Phenomenon in the Nutrition and Dietetics Profession: An Online Cross-Sectional Survey," *International Journal of Environmental Research and Public Health*, vol. 19, no. 9, p. 5558, May 2022, doi: 10.3390/ijerph19095558.

[26] M. Shahjalal *et al.*, "Distribution of imposter syndrome among medical students of Bangladesh: a cross-sectional study," *F1000Research*, vol. 10, p. 1059, Oct. 2021, doi: 10.12688/f1000research.55444.1.

[27] M. V. Awinashe, S. Nawabi, A. M. Khan, S. H. Kolarkodi, S. Srivastava, and M. Q. Javed, "Self-doubt masked in success: Identifying the prevalence of impostor phenomenon among undergraduate dental students at Qassim University," *Journal of Taibah University Medical Sciences*, vol. 18, no. 5, pp. 926–932, Oct. 2023, doi: 10.1016/j.jtumed.2023.01.012.

[28] J. Rice *et al.*, "Impostor syndrome among minority medical students who are underrepresented in medicine," *Journal of the National Medical Association*, vol. 115, no. 2, pp. 191–198, Apr. 2023, doi: 10.1016/j.jnma.2023.01.012.

[29] C. L. Holden, L. E. Wright, A. M. Herring, and P. L. Sims, "Imposter Syndrome Among First- and Continuing-Generation College Students: The Roles of Perfectionism and Stress," *Journal of College Student Retention: Research, Theory & Practice*, vol. 25, no. 4, pp. 726–740, Feb. 2024, doi: 10.1177/15210251211019379.

[30] E. Brennan-Wydra *et al.*, "Maladaptive Perfectionism, Impostor Phenomenon, and Suicidal Ideation Among Medical Students," *Academic Psychiatry*, vol. 45, no. 6, pp. 708–715, Dec. 2021, doi: 10.1007/s40596-021-01503-1.

[31] N. Schubert and A. Bowker, "Examining the Impostor Phenomenon in Relation to Self-Esteem Level and Self-Esteem Instability," *Current Psychology*, vol. 38, no. 3, pp. 749–755, Jun. 2019, doi: 10.1007/s12144-017-9650-4.

[32] Y. Yaffe, "How do impostor feelings and general self-efficacy co-explain students' test-anxiety and academic achievements: The preceding role of maternal psychological control," *Social Psychology of Education*, vol. 26, no. 4, pp. 925–943, Aug. 2023, doi: 10.1007/s11218-023-09767-1.

[33] S. Stone-Sabali, J. O. Uanhoro, S. McClain, D. Bernard, S. Makari, and C. Chapman-Hilliard, "Impostorism and Psychological Distress among College Students of Color: A moderation analysis of Shame-proneness, Race, Gender, and Race-Gender Interactions," *Current Psychology*, vol. 43, no. 4, pp. 3632–3648, Jan. 2024, doi: 10.1007/s12144-023-04579-0.

[34] A. Neufeld, "Moving the Field Forward: Using Self-Determination Theory to Transform the Learning Environment in Medical Education," *Teaching and Learning in Medicine*, pp. 1–6, Jul. 2023, doi: 10.1080/10401334.2023.2235331.

[35] Z. Wei, Y. Li, L. Liu, X. Wu, Z. Qiao, and W. Wang, "You are worth it: Social support buffered the relation between impostor syndrome and suicidal ideation," *Journal of Pacific Rim Psychology*, vol. 18, Jan. 2024, doi: 10.1177/18344909241228471.

[36] Y. Yang, C. Xu, T. Karatas, T. E. Glass, and Y. Maeda, "Achievement Goals, Imposter Syndrome, and Psychological Distress Among Female STEM Students: A Structural Equation Model," *Journal of College Student Retention: Research, Theory & Practice*, Jan. 2024, doi: 10.1177/15210251231219933.

[37] S. Wu, W. Chen, W. Chen, and W. Zheng, "Effects of Cultural Intelligence and Imposter Syndrome on School Belonging through Academic Resilience among University Students with Vocational Backgrounds," *International Journal of Environmental Research and Public Health*, vol. 19, no. 13, p. 7944, Jun. 2022, doi: 10.3390/ijerph19137944.

[38] J. Boyle, D. R. Malcom, A. Barker, R. Gill, M. Lloyd, and S. Bonenfant, "Assessment of Impostor Phenomenon in Student Pharmacists and Faculty at Two Doctor of Pharmacy Programs," *American Journal of Pharmaceutical Education*, vol. 86, no. 1, p. 8474, Jan. 2022, doi: 10.5688/ajpe8474.

[39] M. B. Shreffler, J. R. Murfree, M. R. Huecker, and J. R. Shreffler, "The impostor phenomenon and work–family conflict: An assessment of higher education," *Management in Education*, vol. 37, no. 1, pp. 5–12, Jan. 2023, doi: 10.1177/0892020620959745.

[40] L. Z. Macias-Moriarity, S. M. Sinclair, D. Walker, and M. Purnell, "Impostor Phenomenon and Grit as Predictors of Job Satisfaction in Female Pharmacy Faculty," *Pharmaceutical Research*, vol. 40, no. 10, pp. 2271–2280, Oct. 2023, doi: 10.1007/s11095-023-03518-9.

[41] A. Pervez, L. L. Brady, K. Mullane, K. D. Lo, A. A. Bennett, and T. A. Nelson, "An Empirical Investigation of Mental Illness, Impostor Syndrome, and Social Support in Management Doctoral Programs," *Journal of Management Education*, vol. 45, no. 1, pp. 126–158, Feb. 2021, doi: 10.1177/1052562920953195.

[42] T. Franchi and N. Russell-Sewell, "Medical Students and the Impostor Phenomenon: A Coexistence Precipitated and Perpetuated by the Educational Environment?" *Medical Science Educator*, vol. 33, no. 1, pp. 27–38, Dec. 2022, doi: 10.1007/s40670-022-01675-x.

[43] S. Chang, H. Y. Lee, C. Anderson, K. Lewis, D. Chakravarty, and M. Yates, "Intervening on impostor phenomenon: prospective evaluation of a workshop for health science students using a mixed-method design," *BMC Medical Education*, vol. 22, no. 1, p. 802, Nov. 2022, doi: 10.1186/s12909-022-03824-7.

[44] C. Gibson and P. Lockwood, "Impostor phenomenon traits in radiography students: Findings from a UK pilot survey," *Radiography*, vol. 30, no. 1, pp. 61–65, Jan. 2024, doi: 10.1016/j.radi.2023.10.005.

[45] D. Chakraverty, J. E. Cavazos, and D. B. Jeffe, "Exploring reasons for MD-PhD trainees' experiences of impostor phenomenon," *BMC Medical Education*, vol. 22, no. 1, p. 333, Dec. 2022, doi: 10.1186/s12909-022-03396-6.

[46] Ó. Meadhbh Murray, Y.-L. Tiffany Chiu, B. Wong, and J. Horsburgh, "Deindividualising Imposter Syndrome: Imposter Work among Marginalised STEMM Undergraduates in the UK," *Sociology*, vol. 57, no. 4, pp. 749–766, Aug. 2023, doi: 10.1177/00380385221117380.

[47]   D. Chakraverty, "Faculty Experiences of the Impostor Phenomenon in STEM Fields," *CBE—Life Sciences Education*, vol. 21, no. 84, pp. 1–16, Dec. 2022, doi: 10.1187/cbe.21-10-0307.
[48]   G. Russell and P. Topham, "The impact of social anxiety on student learning and well-being in higher education," *Journal of Mental Health*, vol. 21, no. 4, pp. 375–385, 2012, doi: 10.3109/09638237.2012.694505.
[49]   S. Gadsby, "Imposter Syndrome and Self-Deception," *Australasian Journal of Philosophy*, vol. 100, no. 2, pp. 247–261, Apr. 2022, doi: 10.1080/00048402.2021.1874445.
[50]   World Economic Forum, "Global Gender Gap Report 2023: Insight Report," Jun. 2023. [Online]. Available: https://www.weforum.org/publications/global-gender-gap-report-2023/in-full/benchmarking-gender-gaps-2023/ (accessed May 07, 2024).
[51]   K. Kay and C. Shipman, *The Confidence Code: The Science and Art of Self-Assurance - What Women Should Know*. Manhattan, New York: Harper Business, 2014.

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