

# Investigating Impostor Syndrome Among Postgraduate Anatomy Students

## Lisansüstü Anatomi Öğrencileri Arasında İmpostor Sendromunun Araştırılması

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### ABSTRACT

**Background:** Impostor syndrome (IS) is marked by persistent self-doubt and the fear of being perceived as a fraud, even in the presence of clear accomplishments, and it notably affects high-achieving individuals. This study examined IS prevalence and associated factors among postgraduate anatomy students in Türkiye.

**Materials and Methods:** Using the Clance Impostor Phenomenon Scale, 79 participants were surveyed to assess IS levels alongside demographic and psychiatric variables.

**Results:** The results revealed that 39.2% of participants exhibited frequent impostor feelings (FIF) or intense impostor experiences (IIE). Notably, individuals with psychiatric conditions had significantly higher IS levels, with 64.7% classified in the FIF category and 17.6% in IIE, compared to those without psychiatric issues, who predominantly fell into lower IS categories ( $p<0.05$ ). No statistically significant associations were observed between IS and demographic variables, including gender, marital status, or education level. However, individuals with no income were overrepresented in the IIE category, aligning with findings from studies suggesting a link between socioeconomic status and heightened IS levels.

**Conclusion:** This study underscores the prevalence of IS in postgraduate students within a demanding academic discipline and highlights its association with psychiatric conditions. Increasing awareness of IS, particularly in high-stress, perfectionist professions such as academia, is critical. Such efforts can improve recognition, provide targeted interventions, and mitigate IS's impact on individual well-being and professional performance.

**Keywords:** Impostor syndrome, impostor phenomenon, postgraduate anatomy education

### ÖZ

**Amaç:** İmpostor sendromu (IS), belirgin başarılarla rağmen sürekli kendinden şüphe duyma ve başkaları tarafından bir sahtekar olarak algılanma korkusuyla karakterizedir ve özellikle yüksek başarı gösteren bireyleri etkiler. Bu çalışma, Türkiye'deki lisansüstü anatomi öğrencileri arasında IS yaygınlığını ve ilişkili faktörleri incelemeyi amaçlamaktadır.

**Gereç ve Yöntemler:** Clance Sahtekar Fenomeni Ölçeği kullanılarak 79 katılımcı üzerinde bir anket uygulanmış, SS düzeyleri ile demografik ve psikiyatrik değişkenler değerlendirilmiştir.

**Bulgular:** Sonuçlar, katılımcıların %39,2'sinin sık sahtekâr duyguları (FIF) veya yoğun sahtekâr deneyimleri (IIE) sergilediğini ortaya koydu. Özellikle psikiyatrik rahatsızlığı olan bireylerde IS düzeyleri anlamlı derecede yüksek bulundu; bu grubun %64,7'si FIF kategorisinde, %17,6'sı ise IIE kategorisinde yer aldı. Buna karşılık, psikiyatrik sorunu olmayan bireylerin büyük çoğunluğu daha düşük IS kategorilerinde sınıflandırıldı ( $p<0,05$ ). IS ile cinsiyet, medeni durum veya eğitim düzeyi gibi demografik değişkenler arasında



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**Received:** 12.03.2025 **Accepted:** 13.05.2025 **Publication Date:** 04.07.2025

**Cite this article as:** Ok F, Karip B, Chatzioglou GN, Temizsoy Korkmaz F, Yiğit M. Investigating impostor syndrome among postgraduate anatomy students. Hamidiye Med J. 2025;6(2):85-91



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istatistiksel olarak anlamlı bir ilişki saptanmadı. Ancak, geliri olmayan bireylerin IIE kategorisinde daha yüksek oranda temsil edildiği görüldü ve bu durum, sosyoekonomik durum ile yüksek IS düzeyleri arasındaki bağlantıyı öne süren çalışmalarla tutarlılık gösterdi.

**Sonuç:** Bu çalışma, zorlu bir akademik disiplin içinde yer alan lisansüstü öğrenciler arasında IS'nin yaygınlığını ve psikiyatrik durumlarla ilişkisini vurgulamaktadır. IS'nin farkındalığını artırmak, özellikle akademi gibi yüksek stres ve mükemmeliyetçilik gerektiren mesleklerde kritik öneme sahiptir. Bu tür farkındalık çalışmaları, IS'nin tanınmasını kolaylaştırabilir, hedefe yönelik müdahaleler sunabilir ve bireylerin iyi oluşu ile mesleki performansları üzerindeki etkisini azaltmaya yardımcı olabilir.

**Anahtar Kelimeler:** İmpostor sendromu, impostor fenomeni, mezuniyet sonrası anatomi eğitimi

## Introduction

Impostor syndrome (IS), impostor phenomenon, or IS is a condition in which individuals working in highly qualified positions do not feel qualified enough, despite evidence to the contrary, and are afraid that others will discover that they are an intellectual fraud. Individuals with IS believe they achieved their success entirely by chance, and if rewarded, they fear they will unknowingly damage their positive image. Individuals with IS believe that their success is not the result of their inherent abilities or talent but is instead attributed to external factors such as luck, excessive effort, or the manipulation of others' perceptions (1-3).

This syndrome was first defined by Clance and Imes in 1978. Clance and Imes (1) five-year clinical study was conducted with more than 150 successful women between the ages of 20 and 45 who had doctorates in various specialties such as law, nursing, medicine, social work, and teaching. They were respected professionals in their fields or successful students. Studies have found that despite these women's successes, academic degrees, high scores on standardized tests, and praise from colleagues and respected authorities, they do not experience an inner sense of success and see themselves as "impostors". As a result of the observations, it was seen that many female graduate students thought that they were accepted to graduate programs by mistake or stated that their high exam scores were due to luck, incorrect grading, or faulty evaluations by professors. Female professionals commonly feel that they are overly evaluated by their colleagues and managers. Another characteristic observed about these women is that they tend to deny objective evidence that they are intelligent. They also struggle with accepting compliments or positive feedback. However, when they receive negative feedback, they hide it and view it as a reminder of their shortcomings (4). It has also been revealed that these women experience anxiety due to their constant fear of not being able to continue their success and their inadequacies being revealed (5).

The concept of IS describes individuals who are

successful according to external criteria but experience the illusion that they are inadequate. People naturally present a social self that is different from the self they present in their close relationships because they are forced to do so by society. However, individuals who experience the IS experience greater feelings of inauthenticity and loneliness. This situation is a burden for them (6). Recently, with the influence of positive psychology, studies have been conducted that draw attention to the "bright" aspects of employees. On the other hand, there are individuals who have not internalized their success, doubt their intelligence, and continue to live with the fear that their failures will be discovered one day (7). These individuals, who constantly try to cope with feelings of inadequacy, cannot accept no matter how much objective evidence there is about their success, and continue to experience the fear of being exposed.

Although many characteristics have been attributed to people who feel impostors, Leary et al. (8) stated that these people generally have three defining characteristics. The primary characteristic of IS is the persistent feeling of being an impostor, accompanied by the belief that others perceive them more positively than their actual abilities warrant. The other fear is being exposed as a fraud and others finding out they failed. The third defining characteristic is that they have difficulty internalizing their success, and behave in ways that perpetuate their feelings of fraudulence (8). These emotions cause people with IS to approach the tasks assigned to them in a perfectionist way and to exert more effort than average in the projects they need to do. Individuals with IS tend to set goals that are almost impossible to achieve. If these goals are not achieved, individuals may experience feelings of inadequacy. This extraordinary effort often leads to positive feedback from superiors and colleagues and reinforces this behavioral pattern (9). However, this pattern of behavior can lead to burnout. Medical students, graduate students, residents, and faculty are prime candidates for this burnout syndrome (10).

The literature review revealed that no studies have been reported investigating IS among individuals pursuing postgraduate education in the field of anatomy in Türkiye.

The aim of this study was to identify factors that may be associated with IS, including age, gender, income status, psychiatric conditions and marital status, and to examine the syndrome prevalence in individuals pursuing postgraduate education who were considered potential targets for this phenomenon. Although IS affects many high-achieving individuals across various professions and countries, such as academics, graduate students, and medical doctors, many experience it without recognizing or knowing its name (11-14). Increasing awareness of the syndrome and its associated symptoms can be highly beneficial for these individuals.

Given the increasing recognition of IS as a psychological barrier that impairs performance and well-being in high-achieving individuals, it becomes essential to explore its prevalence in specific academic domains where perfectionism and intellectual rigor are emphasized. Postgraduate anatomy education represents one such environment where IS may occur, yet studies examining IS within this population remain scarce, particularly in Türkiye. The primary aim of this study was to investigate the prevalence and severity of IS among postgraduate students enrolled in anatomy programs. Additionally, the study aimed to examine potential associations between IS and various demographic and psychosocial variables, including age, gender, income level, marital status, and psychiatric history. By identifying subgroups more susceptible to impostor feelings, this study seeks to contribute to the broader understanding of how IS manifests within advanced medical education and inform future interventions aimed at enhancing academic and emotional resilience.

## Material and Methods

This study was reviewed and approved for ethical compliance by the Scientific Research and Publication Ethics Committee of İstanbul Health and Technology University (decision number: 2025/03-01, date: 05.02.2025). This cross-sectional, anonymous online survey was conducted among randomly selected postgraduate anatomy students from various faculties across Türkiye. Participants were invited to participate via email. A web-based (Google form,) survey was conducted among postgraduate anatomy students (master's, doctoral, and medical specialization) in Türkiye in February 2025. There was no need to use a patient consent form.

### Clance IP Scale

The survey, developed by Clance in 1985, is a unidimensional, 5-point Likert-type (1: Not at all true, 5: Definitely true) data collection tool consisting of 20

questions designed to assess individuals' tendencies toward the Impostor Phenomenon. Total scores on the CIPS range from 20 to 100, with a score of 60 or above signifying a strong experience of impostor feelings. The scores obtained as a result of the answers given to the scale were examined in 4 categories: scores less than 40 points show limited few impostor characteristics (FIC), scores between 41-60 show moderate impostor experiences (MIE), scores between 61-80 show frequently impostor feelings (FIF), and scores above 80 points show intense impostor experiences (IIE). According to the results of reliability analyses conducted in a doctoral thesis, the reliability coefficient of the Clance Impostor Phenomenon Scale (n=148) was found to be 0.84 (15). This value supports the previous research showing that the scale is a reliable data collection tool (16).

The survey also consisted of psychiatric conditions and demographic questions, including age, gender, income status, education status, and marital status.

### Statistical Analysis

The statistical methods employed in this study included Crosstabulation Analysis, the chi-square test, the Monte Carlo simulation, and the Fisher's exact test. Crosstabulation was used to examine the distribution of categorical variables, such as age, gender, marital status, income level, educational status, and psychiatric diagnosis, in relation to IS levels. The chi-square test was applied to identify associations between these variables and impostor levels. However, due to the presence of small expected cell frequencies that violated the assumptions of the chi-square test, Monte Carlo simulations, and Fisher's exact test were utilized as alternative methods to ensure the robustness of the results. Monte Carlo simulation generated p-values and confidence intervals through iterative computations, enhancing the reliability of the statistical analysis. Fisher's exact test provided additional support, particularly in cases where sample sizes were small.

In this study, the process of creating graphs and tables from the dataset was supported by utilizing Chat GPT-4, an advanced AI tool.

## Results

### Demographic and IS Characteristics

The study included 79 postgraduate students: IS levels were distributed as FIC (21.5%, n=17), MIE (39.2%, n=31), FIF (32.9%, n=26), and IIE (6.3%, n=5). Gender distribution was nearly balanced, with 50.6% (n=40) male and 49.4% (n=39) female participants. Regarding income status, the majority of participants were state university or government

employees (60.8%, n=48), followed by individuals in private employment (19.0%, n=15), those with no income (11.4%, n=9), participants receiving scholarships (3.8%, n=3), and others with different income sources (5.1%, n=4). Educational status showed that 22.8% (n=18) were master's students, 30.4% (n=24) were PhD students, and 46.8% (n=37) were medical specialization students. Psychiatric status data indicated that most participants had no psychiatric issues (78.5%, n=62), while 21.5% (n=17) reported having psychiatric conditions. The age distribution highlighted the largest group as those aged 26–30 years (48.1%, n=38), followed by 18–25 years (17.7%, n=14), over 35 years (17.7%, n=14), and 31–35 years (16.5%, n=13). In terms of marital status, 54.4% (n=43) were single, while 45.6% (n=36) were married (Table 1).

### The Relationship Between IS and Psychiatric Diagnosis

The crosstabulation analysis revealed notable differences in the distribution of IS levels between participants with

and without psychiatric issues. Among those without psychiatric issues, the proportions were FIC (25.8%), MIE (46.8%), FIF (24.2%), and IIE (3.2%). In contrast, participants with psychiatric issues exhibited distributions of FIC (5.9%), MIE (11.8%), FIF (64.7%), and IIE (17.6%). Statistical analyses confirmed a significant association between psychiatric status and IS levels ( $p < 0.05$ ) (Figure 1).

Variables such as age, gender, marital status, income level, and educational attainment were not found to have a significant effect on impostor level ( $p > 0.05$ ). However, individuals with no income demonstrated a higher representation in the IIE category (22.2%).

### Discussion

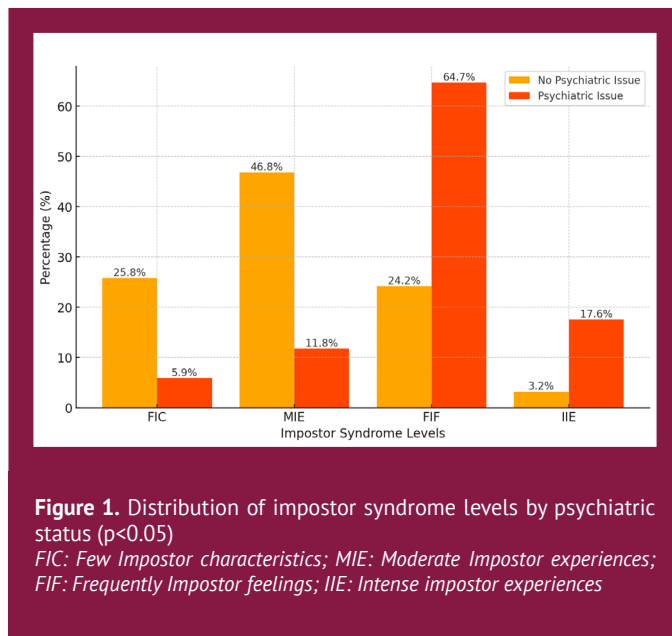
IS, also referred to as the impostor phenomenon, is not a recent concept. Still, it has attracted the attention of researchers in recent years, as it greatly reduces the working performance of individuals and the efficiency of departments and institutions (9,17). In this study, we

**Table 1. Descriptive statistics for participant demographics and characteristics**

Variable	Group	Valid (n)	Percentage (%)
Income status	State university/government employee	48	60.8
	Private	15	19.0
	No income	9	11.4
	Receiving scholarship	3	3.8
	Other	4	5.1
Impostor level	FIC	17	21.5
	MIE	31	39.2
	FIF	26	32.9
	IIE	5	6.3
Education status	Master's student	18	22.8
	PhD student	24	30.4
	Medical specialization student	37	46.8
Psychiatric status	No psychiatric issue	62	78.5
	Has psychiatric issue	17	21.5
Age group	18-25	14	17.7
	26-30	38	48.1
	31-35	13	16.5
	Over 35	14	17.7
Gender	Male	40	50.6
	Female	39	49.4
Marital status	Single	43	54.4
	Married	36	45.6

FIC: Few impostor characteristics, MIE: Moderate impostor experiences, FIF: Frequently impostor feelings, IIE: Intense impostor experiences





reported, for the first time, the prevalence of IS in students receiving postgraduate anatomy education in Türkiye. The number of studies on the prevalence of IS in individuals who teach and receive academic training is limited.

According to the results of this study, 39.2% of participants exhibited frequent impostor feelings and IEE. No previous study conducted among postgraduate students on anatomy that has contributed to the worldwide literature. Therefore, there is no comparable data. However, its prevalence has been reported in various countries among physicians who perform work and among medical, dental, and pharmacy students who undergo intensive training. In the study of Paladugu et al. (18) on hospitalists, the prevalence of IS was reported as 34 percent. In the study conducted by Beckman (19) the prevalence of frequent and intense IS experience among physicians was reported as 23 percent. Studies of U.S. medical students show that 20% to 50% of them have significant experience with IS (10,20,21). In a study conducted among postgraduate medical and surgical doctors in Sri Lanka, the proportion of individuals exhibiting frequent impostor feelings and IEE was reported to be 39.3% (22). Considering the impostor scale score results, the number of students receiving postgraduate anatomy education who show frequently impostor feelings and IEE is aligned with the data reported in global literature.

The study conducted by Shanafelt et al. (23) reported that physicians have a higher rate of disappointment because they require high intellectual knowledge. Since academics who receive postgraduate education also have a high intellectual knowledge requirement, they can be evaluated among similar groups. Since the academic community is a

field that requires serious knowledge and skills in addition to professionalism, it is not surprising that these people are perfectionists and have unrealistic expectations. As a result of this condition, individuals often become trapped in a self-reinforcing behavioral pattern known as the impostor cycle. Within this cycle, perfectionist individuals tend to overwork and prepare excessively for tasks. Despite achieving success, they experience only a fleeting sense of confidence, which quickly dissipates as they attribute their accomplishments not to their abilities but to their hard work and effort. Consequently, they come to believe that they are frauds and live in fear that this will eventually be exposed. This fear compels them to maintain their perfectionistic tendencies and overwork patterns in an effort to avoid such perceived exposure. This cycle persists and perpetuates itself, reinforcing the feelings of inadequacy characteristic of IS (24).

The current study revealed a statistically significant relationship, indicating that individuals with psychiatric disorders exhibited higher levels of impostor feelings, with 64.7% classified in the FIF category and 17.6% in the IIE category. In contrast, individuals without psychiatric disorders predominantly demonstrated lower levels of impostor feelings, categorized as FIC and MIE. These findings suggest a strong association between psychiatric conditions and the severity of impostor experiences. In line with these findings, Shanafelt et al. (23) reported that impostor phenomenon scores correlated with burnout syndrome's emotional and depersonalization domains but were inversely correlated with professional satisfaction. Numerous studies have identified a significant correlation between IS and various psychological and emotional challenges, including anxiety, depression, burnout, and related forms of distress (10,25,26).

When examined in terms of demographic characteristics, no significant relationship was established between the IS and gender in this study. This finding is inconsistent with studies showing that women are more likely to suffer from the IS (21,27,28) and supports previous studies in which the gender variable was insignificant (29,30). Although some past studies have reported that women are more prone to IS, this finding has not been consistent across all professions and settings. A recent systematic review found that comparing genders IS, 16 reported a predisposition in women, while 17 reported no susceptibility (9). This result indicates that the IS is not an individual tendency based on biological sex, that women will be more prone to. Although women have a more active, constructive approach based on social support, men have a less constructive and avoidant approach (31,32). The influence of IS and the associated adaptation strategies on gender differences requires further investigation.

In contrast to our initial hypothesis, the analysis revealed no statistically significant associations between the IS and general demographic characteristics. However, it is noteworthy that individuals with no income exhibited a higher representation in the IIE category. A study by MacInnis et al. (33) offers corroborative evidence, demonstrating that individuals from lower socioeconomic backgrounds exhibit significantly elevated levels of impostor feelings. This finding warrants further investigation and suggests that studies conducted with larger sample sizes may yield more accurate and reliable results.

### Study Limitations

The present study has several limitations, including a limited sample size. However, the study group in our research is limited to postgraduate students specializing in anatomy, resulting in a relatively small sample size. In addition, administering the Clance IP scale to participants once instead of twice may reduce test reliability. Furthermore, while the present study focused on the categorical classification of IS levels, we acknowledge that analyzing mean total CIPS scores across subgroups (such as income or educational status) might have offered further insights. Future studies with larger and more diverse samples could explore such score-based comparisons using parametric or non-parametric methods to enhance the depth of analysis. Despite its limitations, this study offers an initial insight into the prevalence and severity of IS and the sociodemographic characteristics associated with it among graduate students in the anatomy field in Türkiye.

### Conclusion

According to the data obtained in this study and findings from similar studies conducted on comparable professional groups worldwide, IS appears to be highly prevalent. Furthermore, as this syndrome frequently co-occurs with various psychiatric issues, it is imperative to raise awareness, particularly in highly demanding, perfectionism-oriented professions such as academia. Increased attention to IS in such high-stress fields can foster better recognition and address its impact more effectively.

### Ethics

**Ethics Committee Approval:** This study was reviewed and approved for ethical compliance by the Scientific Research and Publication Ethics Committee of İstanbul Health and Technology University (decision number: 2025/03-01, date: 05.02.2025).

**Informed Consent:** There was no need to use a patient consent form.

### Footnotes

#### Authorship Contributions

Concept: F.O., Design: F.O., G.N.C., Data Collection or Processing: F.O., F.T.K., M.Y., Analysis or Interpretation: F.T.K., Literature Search: F.O., Writing: F.O., B.K.

**Conflict of Interest:** No conflict of interest was declared by the authors.

**Financial Disclosure:** The authors declared that this study received no financial support.

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