



Persistent Impostor Phenomenon Is Associated With Distress in Medical Students

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BACKGROUND AND OBJECTIVES: Medical student distress and mental health needs are critical issues in undergraduate medical education. The impostor phenomenon (IP), defined as inappropriate feelings of inadequacy among high achievers is linked to psychological distress. We investigated the prevalence of IP among first-year medical school students and its association with personality measures that affect interpersonal relationships and well-being.

METHODS: Two hundred fifty-seven students at a large, urban, northeastern medical school completed the Clance Impostor Phenomenon Scale (CIPS), Jefferson Scale of Empathy, Self-Compassion Scale, and Zuckerman-Kuhlman Personality Questionnaire immediately before beginning their first year of medical school. At the end of their first year, 182 of these students again completed the CIPS.

RESULTS: Eighty-seven percent of the entering students reported high or very high degrees of IP. Students with higher IP scores had significantly lower mean scores on self-compassion, sociability self-esteem ($P<.0001$ for all), and getting along with peers ($P=.03$). Lower IP scores were related to lower mean scores on neuroticism/anxiety and loneliness ($P<.001$ for both). Women obtained a higher mean IP score than men. IP scores at the end of the school year increased significantly compared with the beginning of the year ($P<.001$), both in frequency and intensity of IP.

CONCLUSIONS: IP was common in matriculating first-year medical students and significantly increased at year's end. Higher IP scores were significantly associated with lower scores for self-compassion, sociability, self-esteem, and higher scores on neuroticism/anxiety.

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Alarming rates of depression, anxiety, and burnout are reported among medical students.¹⁻⁴ Identifying and intervening to support psychological well-being in these learners is a continuing challenge. One personality construct, the impostor phenomenon (IP), is associated with emotional distress in some

high-achieving individuals who are unable to internalize their achievements or take ownership of their success.⁵⁻⁷ IP has been described widely in the lay-press,⁸ social media,⁹ and college publications,¹⁰ but rarely explored in the medical literature. This mindset of self-perceived fraudulence was described by Clance

and Imes in 1978 in female academicians¹¹ and is associated with personality traits including depression, anxiety, neuroticism, low self-esteem, maladaptive perfectionism, increased work-related stress, underperformance, self-sabotage, and diminished career development.⁵⁻⁸ The well-validated Clance Impostor Phenomenon Scale (CIPS) is used to determine the presence and severity of IP.^{11,12} Rates of IP during training in health care professionals were reported in one study as 30% for medical, dental, and pharmacy students.¹³ In a study of medical students, 50% of female and 25% of male students demonstrated significant imposterism.¹⁵ Recently, a small study found that 54% of entering medical students exhibited scores above the cutoff for imposterism, which significantly increased at the end of the M-3 year and remained unchanged at the end of the M-4 year.¹⁶ Studies in graduate medical education show similar results. A study of Canadian family medicine residents found IP in 41% of women and 24% of men.¹⁷ In an internal medicine program, 86% of foreign medical graduates exhibited IP compared with 36% of Canadian

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medical school graduates.¹⁸ A report of US surgical residents and attending physicians found that both exhibited high IP with no gender differences or decrease in IP during training.¹⁹ A qualitative interview-based study of 28 Canadian physicians also found that imposter feelings, self-doubt, and fraudulence were common and persistent.²⁰

The presence of IP in prematriculants to medical school and persistence or changes in these feelings at the end of the first year have not been previously studied. Given the intense pressure and competition faced by undergraduates for medical school admission, as well as the stressors well known to occur in the preclinical years of medical school,¹⁴ we hypothesized that IP would be present in prematriculating students and would increase by the end of that year. We were also interested in exploring which personality traits were related to imposterism in our students.

Methods

Participants and Procedures

Participants were students enrolled in a large urban Pennsylvania medical school class of 2020. We collected data by electronic survey during the month preceding their first year of matriculation (fall 2016) and at the end of the first year (spring 2017) as part of the Jefferson Longitudinal Study of Medical Education.²¹ We connected scores between the pre- and postsurvey by a key numeric variable. The university's committee on human subjects' protection approved the study.

Instruments

Impostor Phenomenon. We used Clance's IP scale, a 20-item validated instrument developed to measure IP.^{11,12} A sample item is: "Sometimes I'm afraid others will discover how much knowledge or ability I really lack." To examine the incidence and degree of IP we administered the CIPS at the beginning and conclusion of the

M-1 year. In addition, we assessed the relationship of IP to personality measures impacting psychological well-being.

Additional instruments included the Jefferson Scale of Physician Empathy,²² Self-Compassion Scale-Short Form,²³ 5-item UCLA Loneliness Scale,²⁴ Rosenberg Self-Esteem Scale,²⁵ and the Zuckerman-Kuhlman Personality Questionnaire²⁶ (Table 1).

Statistical Analyses

We transformed scores on all measures to a standard distribution to assess the magnitudes of group differences for all measures of personality attributes. We transformed scores in order to allow comparisons by gender, across times of administration, and to ensure reproducibility. We classified students into three categories of the IP scale: low (n=33, 13%); moderate (n=142, 55%); or high (n=82, 32%), based on cutoffs recommended by Clance,⁹ with adjustments made by combining the two highest-score categories into one group. The highest score categories represented frequent and intense levels of IP.

We contrasted groups to compare whether low, moderate, and high scorers on the IP scale were associated with measures of personality attributes and well-being. We used univariate and multivariate analysis of variance, and Duncan's post-hoc multiple range tests to examine the main effects of IP, gender, and their interactions on measures of personality and well-being. We used the categorical form of the IP scale as predictors of psychological scale outcome scores.

Results

Complete data on the IP, self-compassion, and measures of personality were available for 257 students (128 men, 129 women; 97% of the first-year class). Thirty-two percent reported high degrees of IP, while 55% reported moderate or low IP (13%). A slightly higher proportion of women (35%, 45) than men (29%,

37), experienced high IP (Figure 1). Additionally, we found statistically significant differences between those with low, moderate, and high IP scores ($P<.0001$), and by gender on certain personality measures ($P<.05$) (Figure 2). Higher IP scores were associated with significantly lower scores on self-compassion ($F_{(2, 251)} = 65.9$); sociability ($F_{(2, 251)} = 12.3$); self-esteem ($F_{(2, 251)} = 20.5$); getting along with others ($F_{(2, 251)} = 3.6$); and health status ($F_{(2, 251)} = 6.6$) all $P<.001$. Conversely, students with lower IP scores obtained lower scores on neuroticism/anxiety ($F_{(2, 251)} = 37.4$) and loneliness ($F_{(2, 251)} = 33.4$) both $P<.001$; Figure 2). Furthermore, women scored significantly higher than men on the neuroticism/anxiety scale (Figure 2).

Prospectively, the percent of students with high IP scores (61 to >80) was greater at the end of the first year (spring 2017=49%) than at matriculation (fall 2016=29%; $\chi^2=20.73$; $P<.001$), suggesting that IP persisted and intensified over the first year (Figure 3). Conversely, the percentage of students with imposter scores from the moderate IP category measured in the fall (59%) significantly decreased, to 43%.

Discussion

Our findings support the hypothesis that high degrees of IP are present in our students before matriculation, that they increase in incidence and degree over the first year, and are related to personality traits associated with emotional distress. Students with feelings of alienation from their peers and lower self-esteem and self-compassion were more likely to report IP. The degree of imposterism in students prior to matriculation was unexpectedly high. We believe this may be due in part to intense pressure and competition for admission experienced by medical school applicants, and should be explored further. Since IP is a malleable personality construct, and therefore responsive to intervention, supportive feedback and collaborative learning,

Table 1: Empathy and Personality Attribute Scales Administered Prior to Matriculation

Jefferson Scale of Physician Empathy	Twenty-item validated instrument specifically developed to measure empathy in the context of patient care in medical and other health professions students and practitioners. We used the S-version of the JSE, which was developed for administration to medical students. A sample item on this scale is: "It is difficult for a physician to view things from patients' perspectives." ²²
Self-Compassion Scale Short Form	Twelve-item validated scale, measures a tendency to act with self-kindness rather than self-judgment, with mindfulness rather than over-identification, and with a sense of common humanity rather than isolation. Participants rate items on a 5-point Likert scale. A higher score on the scale indicates a more self-compassionate orientation. A sample item is: "When I fail at something important to me I become consumed by feelings of inadequacy." ²³
UCLA Loneliness Scale	Five-item version of the UCLA Loneliness Scale, which is a global measure of loneliness experiences. The abridged version has been used previously with medical and other health professions students, and its psychometric validity in medical students has been reported. A sample item from this scale is: "I feel isolated from others." ²⁴
Rosenberg Self-Esteem Scale	Abridged, five-item version of the Rosenberg Self-Esteem Scale, which is a measure of the self-acceptance aspect of self-esteem. This abridged scale has been used with medical and other health professions students. The reliability coefficient of this abridged scale among health professions students has been reported as 0.72. A higher score on this scale indicates a higher degree of self-esteem. A sample item from this scale is: "I feel that I am a person of worth, at least on an equal basis with others." ²⁵
Neuroticism-anxiety scale from ZKPQ	Seven-item scale from the short form of the ZKPQ that measures a tendency to be tense, to worry, to be overly sensitive to criticism, to be easily upset, and to be obsessively indecisive. A sample item from this scale is: "I often worry about things that other people think are unimportant." ²⁶
Aggression-hostility scale from QKPQ	Seven-item scale from the short form of the ZKPQ that measures a tendency to express verbal aggression and to show rudeness, thoughtlessness, vengefulness, spitefulness, a quick temper, and impatient behavior. A sample item from this scale is: "If people annoy me, I do not hesitate to tell them so" ²⁶
Activity Scale from the ZKPQ	Seven-item scale from the short form of the ZKPQ that measures a tendency to be active and to prefer challenging work. Evidence in support of the validity and reliability of this scale in male ($\alpha=0.67$) and female ($\alpha=0.72$) college students has been reported. A higher score on this scale indicates a higher degree of preference for challenging work. A sample item from this scale is: "I like complicated jobs that require a lot of effort and concentration." ²⁶
Sociability scale from the ZKPQ	Seven-item scale from the short form of the ZKPQ that measures a tendency to be active and to prefer challenging work. A sample item from this scale is: "I like complicated jobs that require a lot of effort and concentration." ²⁶
Getting along with others (1 item)	Single-item (4-point Likert scale, 1=Strongly Disagree, 4=Strongly Agree) scale to measure how well participants could get along with their classmates: "In early years of your schooling, you generally got along with your classmates." A higher score indicates better ability to get along with peers.
Health status (1 item)	Single-item (4-point Likert scale, 1=Poor, 4=Excellent) scale to measure participants' rating of their own general health status: "How do you rate your health in general?" A higher score indicates better health.

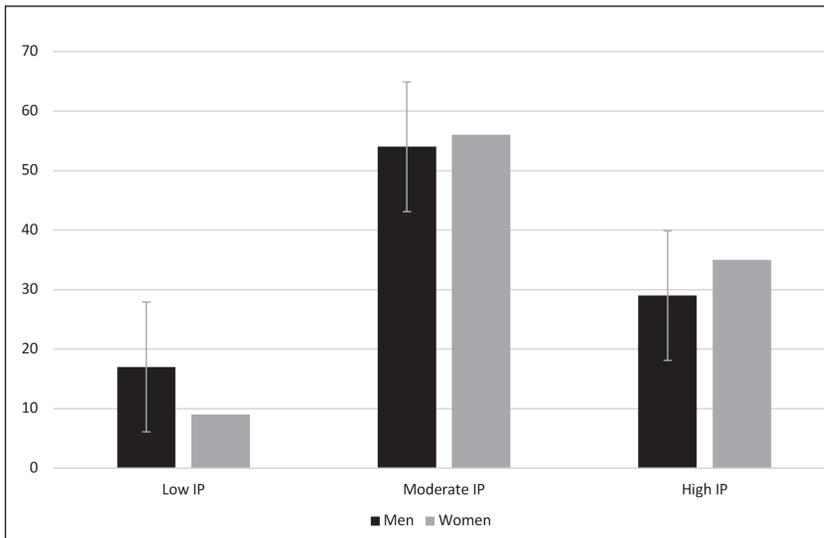
mentoring by faculty, academic support, individual counseling and group discussions with peers are all helpful.⁵ We currently begin to address IP at first-year orientation, continuing in our counseling center through workshops, individual

therapy, and group therapy. In our experience, for many students, the most powerful first step in addressing and ameliorating IP is normalizing this distorted and maladaptive self-perception through individual

sessions with faculty and mentored small group discussions with peers.

We recognize that this study had several limitations. The population studied represents a sample of only first-year students measured at two points in time at a single medical

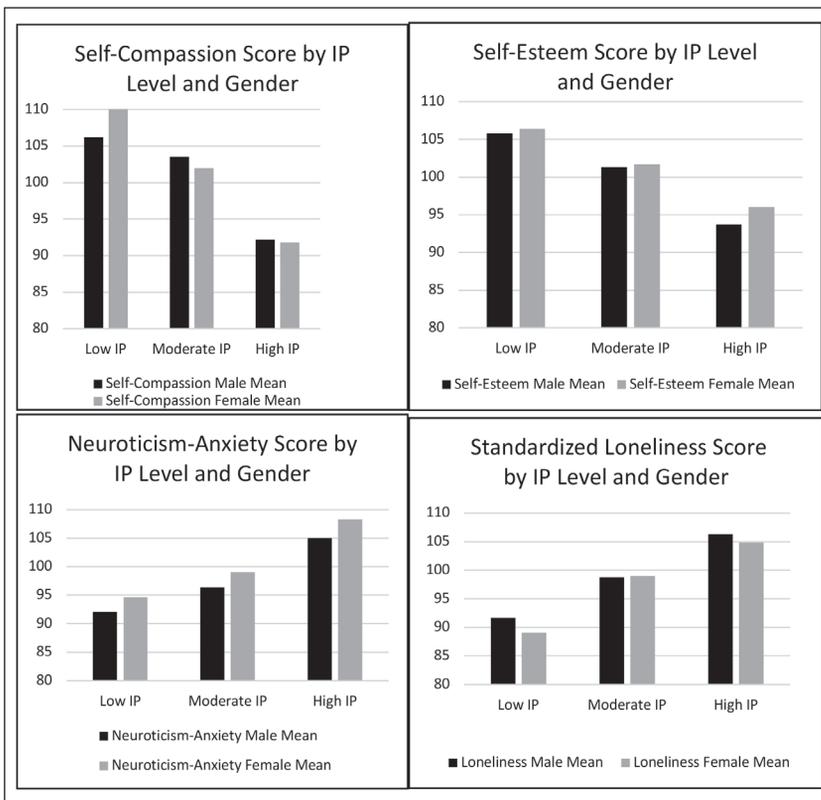
Figure 1: Percentage of Men and Women in Each IP Score Category



Legend for Figure 1: The mean IP score was 101.5±10.3 for women and 98.5±9.5 for men ($P=.02$, effect size=0.30) in fall 2016.

Abbreviation: IP, imposter phenomenon.

Figure 2: Comparison of Standardized Scores on Scales of Self-Compassion, Self-Esteem, Anxiety and Loneliness, by IP Score and Gender



Legend for Figure 2: Univariate analysis of variance showed that students with higher IP scores had significantly lower scores on self-compassion ($F_{(2, 251)}=65.9, P<.0001$, effect size=1.62) and self-esteem ($F_{(2, 251)}=20.5, P<.0001$, effect size=1.47). Students with lower IP scores had lower scores on neuroticism/anxiety ($F_{(2, 251)}=37.4, P<.001$) and loneliness ($F_{(2, 251)}=33.4, P<.001$).

Abbreviation: IP, imposter phenomenon.

college. Since IP was associated with personality traits linked to depression, anxiety, and burnout, early identification of IP in our learners may lead to more timely intervention to prevent distress and burnout in future physicians. Additional research is needed to determine how best to support students in overcoming IP during undergraduate medical education and future training.

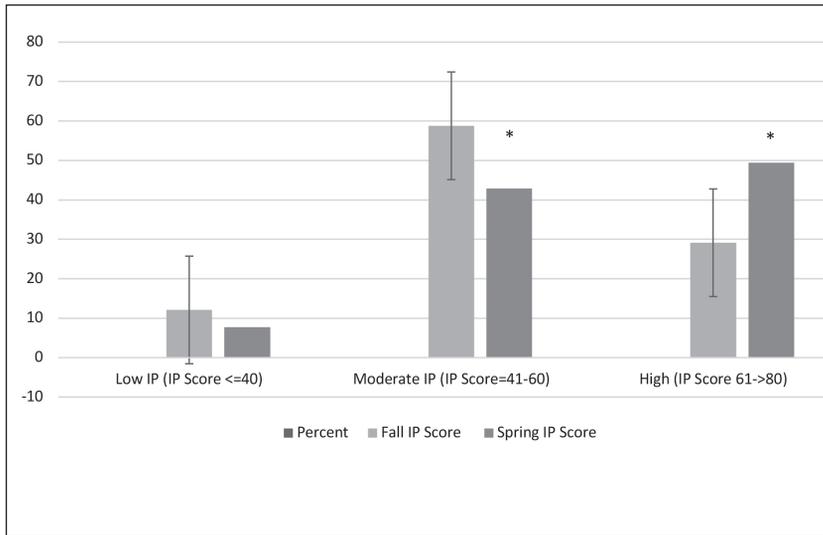
PRESENTATIONS: A version of these findings was presented at the 2019 Association of American Medical Colleges Group on Student Affairs Conference.

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Figure 3: Comparison of Imposter Score Groups by Semester (Fall vs Spring 2016-2017)



A greater percentage of students reported high IP in the spring than the fall (49% vs 29%; $P < .001$).

Abbreviation: IP, imposter phenomenon.

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