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THE ROLE OF IMPOSTOR SYNDROME ON MEDICAL STUDENT CAREER PLANS

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Abstract

Background/Objective:

Impostor syndrome (IS) is an internal experience, among high achieving individuals, of feelings of intellectual incompetence and inadequacy, accompanied by fear that others will discover them to be intellectual frauds. Originally defined in successful women, IS has been identified in numerous successful individuals, including medical students and residents. IS has also been correlated to race-related stress experienced among Black students. We measured IS among medical students and compared the prevalence of IS among underrepresented minorities in medicine (UiM) medical students compared to non-UiM medical students at two medical institutions. We also analyzed if different levels of IS negatively correlates with students applying into competitive specialties.

Methods:

A 5-10 minute anonymous survey was administered to all medical students at a private ivy league medical school (school A) and a historically Black college/university (HBCU) medical school (school B) through the software Qualtrics. The survey consisted of three parts, including collecting demographics, assessing student's specialty interest, and the Clance Impostor Scale, a validated tool to measure IS, which places students into one of four levels of severity of IS. Statistical calculations were performed through Excel and R-Studio using paired t-test and chi-squared test.

Results:

A total of 284 students fully completed the survey, 187 students (66%) from the ivy league medical school, and 97 students (34%) from the HBCU. 37% of students identified as UiM, with a majority of UiM students from the HBCU (70 students versus 36). Among all students, 3.2% experience low IS (1), 38.4% moderate IS (2), 49.6% have IS feelings (3), and 8.8% experience intense IS (4). More students from the ivy league experienced higher levels of IS (1: 1.6%, 2: 32.1%, 3: 54.5%, 4: 11.8%), while more students from the HBCU experienced lower levels of IS (1: 6.2%, 2: 50.5%, 3: 40.2%, 4: 3.1%) ($P < 0.001$). There was no statistically significant difference in the level of IS between UiM students and non-UiM students (UiM 1: 4%, 2: 45%, 3: 45%, 4: 6%; Non-UiM 1: 3%, 2: 34%, 3: 52%, 4: 11%) ($P = 0.184$). There was also no significant difference in the distribution of feeling of IS among students who have a desire to go into a "competitive" specialty versus those who do not.

Conclusion:

From this pilot study, a majority of students suffer from normal to intense feelings of IS. We found there to be a statistically significant higher number of students from the ivy league medical school to experience normal to intense feelings of IS compared to students who attended an HBCU. We found no statistically significant difference in the severity of IS among gender, students who identify as UiM or not, difference in age group or year in medical school, first-generation college graduates, students who applied or plan applied into competitive specialties versus not, and students who applied or plan to apply into a primary care or surgical specialty. More work should be conducted to understand why students who attend an ivy league medical school have higher levels of IS compared to students who attend an HBCU medical school, along with creating initiatives to help address these feelings of IS students experience.

Introduction

Impostor phenomenon (IP) (also known as impostor syndrome (IS)) is an internal experience, among high achieving individuals, of feelings of intellectual incompetence and inadequacy, accompanied by fear that others will discover them to be intellectual frauds (3). Originally defined in working white women of the business sector, Clance et al. stated the origin of IP stemmed from family dynamics, societal expectations and stereotypes. In the 1980s, based on societal views, a woman was defined to not be as competent therefore manifesting self-doubt that her success was because of her ability (3). IP has now shown to be relevant in both men and women of many different occupations and among different racial groups. IP specifically has been found in high rates in medical students and residents of multiple specialties including surgery and family medicine, and is associated with higher symptoms of depression, anxiety and feelings of burnout (5-8).

Minority students attending predominantly white institutions may face additional stressors while attaining a degree compared to students within the majority (9). Among these categories of stressors there are those that are minority related or race related stressors, which include racial discrimination, microaggression (racial charged insensitive or marginalizing comments), fear of not belonging, and the “token status”. These race related stressors experienced by minority students has been positively correlated to higher levels of IP (10).

There is clear evidence that IP is experienced in higher rates of minority students and medical trainees, however there is little to no literature looking at IP among Underrepresented in Medicine (UiM) medical students at different medical institutions. There is also clear evidence that IP has negative effects on a student’s psychological wellbeing, however it is poorly understood how IP may influence a student’s pursuit of their professional goal. We hope to explore these questions with our study.

Black/African Americans represent 12% of the American population, however within the field of medicine only 4.1% of licensed physicians identify as Black/African American. This underrepresentation is even more pronounced amongst the most “competitive” residency specialties within medicine, including Dermatology (3.1%), Plastic Surgery (2.4%), Neurosurgery (3.4%), Orthopedics (2.7%) and ENT (2.1%) (1). Therefore, this then raises the question, why is there underrepresentation of UiM students in the most competitive specialties within the field of medicine. Is there an intrinsic barrier affecting UiM students applying into these fields such as IP, or are there more extrinsic factors preventing these UiM students from matching into these specialties such as unconscious bias and USMLE score cut offs? As it relates to the intrinsic factors affecting UiM medical students, IP is a described entity amongst medical students, however there is little to no literature examining IP as it relates to UiM medical students and its effects on the residency decision making process. Understanding these factors that may be leading to an underrepresentation of UiM students in these specialties is important because it parallels efforts to continue to eliminate racial health disparities and promote health equity (13).

Methodology

Participants

From November 2019 to end of December 2019 medical students from two medical school institutions, a private ivy league medical school (school A) and historically Black medical school (school B), received an email invitation to participate in an anonymous, web-based survey. The study was reviewed and approved by both institution's IRB board.

Data Collection

To investigate the study questions, we administered a 5-10-minute survey through the software Qualtrics. The survey included three parts. In Part one demographic data was collected including: gender, age, race, medical school, year in medical school, anticipated graduation year, step one score if applicable, if the student passed step 1 on the first attempt, number of publications thus far, if the student was a first generation college graduate, if the student had any family members in medicine, and if the student was applying into residency for the 2019-2020 cycle. Part two comprised of Clance Impostor Scale, which is a 20-item scale where subjects rate statements on a 5- point Likert scale, validated to measure impostor phenomenon (15). If the total score is 40 or less, the respondent has few Impostor characteristics; if the score is between 41 and 60, the respondent has moderate IP experiences; a score between 61 and 80 means the respondent frequently has Impostor feelings; and a score higher than 80 means the respondent often has intense IP experiences. This scale has been used in to assess IP among medical students in other studies (16). Part three focused on student's specialty choice. In part A students were first asked which specialty they would apply to if "Hypothetically, if you were guaranteed a spot at any residency program of your choosing, in any specialty of your choosing, what specialty would you want to go into?" Students were only able to choose one specialty. In part B participants were asked "What specialty or specialties do you plan to apply into?". Participants could select more than one specialty and also could select if they were undecided. In each part of part 3, the same additional questions were asked including questions about student's perception of how competitive the specialty was, if their step 1 score, number of publication/presentations was competitive to apply into the specialty, if the student had a mentor or prior experience in the specialty, if they knew residents of attendings of their race in the specialty, if they had a family member in the specialty and lastly if they believed they would be able to match into a residency program in the specialty. Students who chose a different specialty choice in Part A versus Part B were also asked why they selected a different specialty choice in part B.

Statistical analysis

All statistical calculation were performed using excel and R studio. The data was collected by Qualtrics and then imported into excel and R studio for analysis. The levels of feelings of IP were analyzed across gender, age, UiM status, which medical school the student attended, year in medical school, step 1 score, and if student ideal specialty choice was different then which specialty they applied into or planned to apply into. All these factors were compared using chi-squared and t-test. Statistical significance was set at $p < 0.05$.

Variable Definition

We defined competitive specialties by adopting the same methods of Dr. Kevin Jubbal from his program website "medschool insiders". The following parameters were used to "rank" the specialties: applicant's average step 1 score, step 2 score, average number of publication/presentation an applicants has, percentage of applicants who are AOA and percentage of applicants from top 40 NIH schools score. The following data was collected from the National Resident Matching Program. More detail on this method can be found in the link listed in the citation (14). The following specialties were considered "more competitive" to apply into: Dermatology, Radiation Oncology, Plastic Surgery, Interventional Radiology, Neurosurgery, Vascular Surgery, Orthopedic Surgery, Urology, Ophthalmology, Otolaryngology and Thoracic Surgery. The following specialties were considered primary care: Internal Medicine, Family Medicine, Pediatric Medicine, Med/Peds, and OBGYN. The following specialties were considered surgical specialties: Plastic Surgery, Neurosurgery, Orthopedic Surgery Otolaryngology, Vascular Surgery, General Surgery, OBGYN, Urology, Ophthalmology.

Table 1:Demographics	Count (Percentage)
Private Ivy League Medical School	187 (65.8)
Historically Black Medical School	97 (34.2)
Gender	
Woman/Female	167 (58.8)
Man/Male	111 (39.1)
Non-Binary/Third Gender	4 (1.4)
Prefer not to say	2 (0.7)
Race	
White	88 (31.0)
Asian	72 (25.4)
Black	76 (26.8)
Hispanic	16 (5.6)
American Indian or Alaska Native	1 (0.4)
Multiple Races	22 (7.7)
Other	8 (2.8)
Prefer not to say	1 (0.4)
UiM	106 (37.3)
UiM attending Private Ivy League	36 (19.3)
UiM attending HBCU	70 (72.2)
Age	
21-23	50 (17.6)
24-26	167 (58.8)
27-29	45 (15.8)
Over 29	22 (7.7)
First Generation college graduate	53 (18.7)
Year	
MS1	61 (21.5)
MS2	60 (21.1)
MS3	52 (18.3)
MS4	83 (29.2)
MS4+	22 (7.7)

MS4+ PHD	5 (1.8)
Applying in 2019	91 (32.0)
No Family member in medicine	178 (62.7)
Complete Core Clerkship	130 (45.8)
Currently in Core clerkship	66 (23.2)
Not Started core clerkships	88 (31.0)

	Level of Impostor Phenomenon (%)				P value
	Few IP feelings	Moderate IP feelings	Frequent IP feelings	intense IP experience	
Medical School					0.00044 32
Private Ivy League	3 (1.6)	60 (32.1)	102 (54.5)	22 (11.8)	
HBCU	6 (6.2)	49 (50.5)	39 (40.2)	3 (3.1)	
Minority Status					0.1838
UiM	4 (3.8)	48 (45.3)	48 (45.3)	6 (5.7)	
Non-UiM	5 (2.8)	61 (34.3)	93 (52.2)	19 (10.7)	
School and Minority Status					
HMS UiM	0	12 (33.3)	19 (52.8)	5 (13.9)	0.01187
MSM UiM	4 (5.7)	36 (51.4)	29 (41.4)	1 (1.4)	
HMS non UiM	3 (2.0)	48 (31.8)	83 (55.0)	17 (11.3)	0.116
MSM non UiM	2 (7.4)	13 (48.1)	10 (37.0)	2 (7.4)	
Gender					0.6778
Male	5 (4.5)	50 (45.0)	47 (42.3)	9 (8.1)	
Woman	4 (2.4)	57 (34.1)	90 (53.9)	16 (9.6)	
Third Gender	0	2 (50.0)	2 (50.0)	0	
Year in Medical School					0.213
MS1	5 (8.2)	26 (42.6)	27 (44.3)	3 (4.9)	
MS2	2 (3.3)	26 (43.3)	24 (40.0)	8 (13.3)	
MS3	0	18 (34.6)	29 (55.8)	5 (9.6)	
MS4	2 (2.4)	29 (34.9)	46 (55.4)	6 (7.2)	
MS4+ MD/PHD	0	4 (80.0)	1 (20.0)	0	
MS4+, not MD/PHD	0	6 (27.3)	13 (59.1)	3 (13.6)	

Ages					0.1962
21-23	3 (6.0)	22 (44.0)	18 (36.0)	7 (14.0)	
24-26	3 (1.8)	65 (38.9)	83 (49.7)	16 (9.6)	
27-29	2 (4.4)	13 (28.9)	29 (64.4)	1 (2.2)	
29+	1 (4.5)	9 (40.9)	11 (50.0)	1 (4.5)	
Step 1 Score					0.7113
1 SD below mean (194-210)	0	5 (38.5)	8 (61.5)	0	
Average (211-249)	2 (2.6)	29 (38.2)	37 (48.7)	8 (10.5)	
1SD above mean (250+)	0	14 (32.6)	25 (58.1)	4 (9.3)	

Results:

Participants:

318 students participated in the survey with a total of 284 students (89%) fully completed the survey, 187 students (66%) from the private ivy league and 97 students (34%) from the historically Black medical school. 167 students (59%) identified as woman gender and 111 (39%) as man gender. 26.8% of students identified as Black, 5.6% as Hispanic and 1 student identified as American Indian/Alaska, 31.0% as white and 25.4% as Asian. 37% of students identified as UiM with majority of UiM students from the historically Black medical school (70 students versus 36 students). Majority of the students were ages 24-26. There was even distribution of students from each year in medical school (MS1: 21.5%, MS2: 21.1%, MS3: 18.3%, MS4: 29.2, MS4+: 9.5%). 91 students (32%) were applying to residency in the 2019-2020 application cycle (table 1).

Level of Impostor Syndrome

Among all students 3.2% experience low IS, 38.4% moderate IS, 49.6% has IS feelings and 8.8% of students experience intense IS. Among ivy league students more experienced higher levels of IS (1: 1.6%, 2: 32.1%, 3: 54.5%, 4: 11.8%), while historically Black medical school students experienced lower levels of IS (1: 6.2%, 2: 50.5%, 3: 40.2%, 4: 3.1%) ($P < 0.001$). There was no statistically significant difference in the level of IS between UiM students and non-UiM students (UiM 1: 4%, 2: 45%, 3: 45%, 4: 6%; Non-UiM 1: 3%, 2: 34%, 3: 52%, 4: 11%) ($P = 0.184$). There was a statistically significant difference in the level of IS between UiM students at the ivy league medical school versus the historically Black medical school (School A 1: 0 2: 33.3%, 3: 52.8%, 4: 13.9% ; School B 1: 5.7%, 2: 51.4%, 3: 41.4%, 4: 1.4%, $P = 0.012$). There was no difference in level of IS between non UiM students at the ivy league medical school versus the historically Black medical school. (Table 2)

Specialty choice and Impostor Phenomenon:

40 students (14%) changed which specialty they would ideally go into versus which specialty they applied into or which specialty they realistically will apply into. 5 students (5.5%) who applied in 2019 changed their ideal specialty choice while 35 students (18.1%) of non applicants changed their ideal specialty choice. 18 students (6.3%) indicated at the time that they are undecided. There was no difference in in distribution of feeling of IS among student who changed their specialty in part A from part B. 77 of students (27%) described a desire to go into a “competitive” specialty with similar percentage among school A and school B students, and 31% of those students were UiM. There was no significant difference in distribution of IS among students who have a desire to go into a “competitive” specialty versus those who do not. 135 students (47.5%) applied or plan to apply into primary care specialties and 99 students (34.9%) applied or plan to apply into surgical specialties. There was no difference in levels of IP among students who applied or planned to apply into primary care versus not or students who planned to apply into a surgical specialty or not.

There appears to be no significant difference in level of impostor syndrome between gender identity, students who identify as UiM or not, difference in age group or year in medical school, first generation college graduates, students with a family member in medicine, step 1 score, or number of publication. (Table 2).

Discussions

Our pilot study found that students from the private ivy league medical school have higher levels of feeling of IP compared to students from the historically Black medical school. Along with this we found UiM students from the private ivy league medical school had higher levels of IP compared to UiM students from the historically Black medical school. However we did not find a difference in level of IP feelings between UiM and non UiM students at both institutions. We also found no difference in level of IP between students applying into or plan to apply into competitive specialties versus those that are not.

Previous studies have found high rates of IP among medical students but other studies have not compared students at different “types” of medical school, for example comparing a private ivy league medical school to students attending a private non ivy league school. Our study found that students attending private ivy league medical school more frequently have feelings of IP compared to students attending historically Black medical school. The question arises why medical students at private ivy league medical school may face these additional stressors compared to students attending an historically Black medical school. First is to note the number of UiM students at the historically Black medical school compared to the private ivy league is much higher, 72% versus 19% as shown in table 1, with a majority of these students being Black/African American. Previous studies have demonstrated that UiM students attending predominantly white institutions may face additional stressors while attaining a degree compared to students within the majority (9). Among these categories of stressors there are those that are minority related or race related stressors, which include racial discrimination, microaggression (racial charged insensitive or marginalizing comments), fear of not belonging, and the “token status”. These race related stressors experienced by African American students has been positively correlated to higher levels of IP (10). Although studies have shown African American students face these additional stressors because of their race, having a strong racial identity has the potential to be a protective factor against increase feelings of IP (11). This may explain why UiM students attending a historically Black medical school, whose mission is to educate students of color, also having a more diverse student body and faculty, may protect students from having higher levels of IP feelings associated with fear of not belonging and being “token status”, which may be experienced by UiM students at majority medical schools. Secondly these findings may also explain why UiM students at the private league medical school has higher levels of IP compared to UiM students at the historically Black medical school. The private league medical school having a less diverse student body and faculty may influence the race related stressors UiM students are facing at the private ivy league medical school. Also noted we did not see a

difference in level of IP among non UiM students experienced at the historically Black medical school versus the private ivy league medical school, demonstrating that non UiM students may not face the same race related stressors at a non minority institution.

Most studies continue to show IP amongst females to be significantly higher than amongst males (7,8). When controlling from gender at both institutions we did not find any difference in level of IP. Other studies have cited possible explanation for gender differences to be lack of women faculty role models leading to psychological problems during professional training. However this gap is slowly decreasing with AAMC 2018-2019 data stating 47% of medical school graduates were women compared to 41% two decades ago and 24% four decades ago. This pipeline is enriching the workspace environment that medical students see with 41% of medical school faculty are women. Greater representation of women in the medical field may be a major factor positively influencing women medical students.

Addressing feelings of impostor phenomenon is important because IP has been linked to mental health problems such as depression, anxiety, decreased self-esteem, and psychological distress (9). Through many studies, even though IP scores are consistently higher in women when compared to men, when IP is experienced in men, negative symptoms of mental health such as depression and anxiety did not significantly differ between men or women (4). Cockley et al. found both minority status stress and impostor feelings were significantly correlated with psychological distress and psychological well beings among all ethnic minority groups (African American, Latino, Asian). However, IP was a much stronger predictor than minority status stress in psychological distress and psychological wellbeing (12). In our study, both findings of no difference in level of IP comparing men and women and the findings of decreased level of IP at the historically Black medical institution for UiM demonstrates how more diverse student body and representation of women and minority people in the medical field can lead to lower feelings of IP among medical students and potentially less psychological stress because of this.

Our study also investigated if increased feelings of IP are associated with students applying into less “competitive” specialties. Our study found no difference in level of IP among student applying or who plan to apply into competitive specialties versus not. There was also no difference in level of IP among students applying into surgical specialties or primary care specialties. Factors that may influence students applying into competitive specialties versus not, including step 1 score, number of publications, having family members in medicine or not, were not found to have a difference in the level of IP among students with higher step 1 scores or more publications for example.

Overall our study finds that majority of medical students at these two institutions have moderate to frequent feelings of IP. Understanding the effect IP can have on student’s psychological wellbeing can be a target for mental health providers to discuss with students and develop coping strategies to decrease feelings of IP.

This is a pilot study so there are several limitations and further studies should be conducted on this subject. First, the results of the study were gathered through self reported measures. At this point we were only able to survey two institutions and may not be generalizable to other types institutions and medical students around the country including public state medical schools and private non ivy league medical school. More studies should be conducted to measure IP amongst more institutions and medical students. Lastly more studies should be conducted to see the impact of interventions for students such as more open discussion about impostor syndrome feelings and the psychological distress it can lead to along with additional counseling services for students.

Conclusion:

From this pilot study, a majority of students suffer from normal to intense feelings of IS. We found there to be a statistically significant higher number of students from the ivy league medical school to experience normal to intense feelings of IS compared to students who attended a historically Black

medical school and we also saw this difference among UiM students at the ivy league versus the historically Black medical school. We found no statistically significant difference in the severity of IS among gender, students who identify as UiM or not, difference in age group or year in medical school, first-generation college graduates, students who applied or plan applied into competitive specialties versus not, and students who applied or plan to apply into a primary care or surgical specialty. More work should be conducted to understand why students who attend an ivy league medical school have higher levels of IS compared to students who attend an historically Black medical school, along with creating initiatives to help address these feelings of IS students experience.

References:

1. Diversity in the Physician Workforce: Facts & Figures 2014. (2014). Retrieved from <http://www.aamcdiversityfactsandfigures.org/>
2. Faber, D. A., Joshi, S., & Ebell, M. H. (2016). US Residency Competitiveness, Future Salary, and Burnout in Primary Care vs Specialty Fields. *JAMA Internal Medicine*, 176(10), 1561-1563.
3. Clance, P. R., & Imes, S. A. (1978). The imposter phenomenon in high achieving women: Dynamics and therapeutic intervention. *Psychotherapy: Theory, Research & Practice*, 15(3), 241-247.
4. Mcgregor, L. N., Gee, D. E., & Posey, K. E. (2008). I Feel Like A Fraud And It Depresses Me: The Relation Between The Imposter Phenomenon And Depression. *Social Behavior and Personality: An International Journal*, 36(1), 43-48.
5. Henning, K., Ey, S., & Shaw, D. (1998). Perfectionism, the impostor phenomenon and psychological adjustment in medical, dental, nursing and pharmacy students. *Medical Education*, 32(5), 456-464.
6. Leach, P. K., Nygaard, R. M., Chipman, J. G., Brunsvold, M. E., & Marek, A. P. (2019). Impostor Phenomenon and Burnout in General Surgeons and General Surgery Residents. *Journal of Surgical Education*, 76(1), 99-106.
7. Oriel, K., Plane, M. B. (2004). Family Medicine Residents and the Impostor Phenomenon. *Family Medicine*, 36(4), 248-52.
8. Villwock, J. A., Sobin, L. B., Koester, L. A., & Harris, T. M. (2016). Impostor syndrome and burnout among American medical students: A pilot study. *International Journal of Medical Education*, 7, 364-369.
9. Bernard, D. L., Lige, Q. M. (2017). Impostor Phenomenon and Mental Health: The Influence of Racial Discrimination and Gender. *Journal of Counseling and Psychology*. 64(2), 155-166.
10. McClain, S., Beasley, S. T., Jones, B., Awosogba, O., Jackson, S., & Cokley, K. (2016). An Examination of the Impact of Racial and Ethnic Identity, Impostor Feelings, and Minority Status Stress on the Mental Health of Black College Students. *Journal of Multicultural Counseling and Development*, 44(2), 101-117.
11. Bernard, D. L., Hoggard, L. S., & Neblett, E. W. (2018). Racial discrimination, racial identity, and impostor phenomenon: A profile approach. *Cultural Diversity and Ethnic Minority Psychology*, 24(1), 51-61.
12. Cokley, K., McClain, S., Enciso, A., & Martinez, M. (2013). An Examination of the Impact of Minority Status Stress and Impostor Feelings on the Mental Health of Diverse Ethnic Minority College Students. *Journal of Multicultural Counseling and Development*, 41(2), 82-95.

13. Laurencin, C., & Murray, M. (2017). An American Crisis: The Lack of Black Men in Medicine. *NAM Perspectives*, 7(6).
14. Jubball, K., MD. (2018, November 10). Top 5 Most Competitive Specialties in Medicine. Retrieved from <https://medschoolinsiders.com/medical-student/top-5-most-competitive-specialties-in-medicine/> 15.