



Imposter Syndrome and Class Gender Ratios in Osteopathic Medical Schools

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OVERVIEW

Imposter syndrome (IS) is a pattern of feeling self-doubt, incompetence, and intellectual fraudulence despite success. IS is common among healthcare professionals. It impacts both male and female medical students but has been found to be more prominent in females¹. Published research has shown IS can impact medical school students, residents, and physicians throughout their professional careers^{2,3}. Various studies have examined the correlation between IS and burnout in allopathic medical students. One study found that approximately half of female students and a quarter of male students experience IS. The same study also surveyed their medical students for burnout and found a positive correlation with IS¹. Our study expands on previous work in the field and examines the relationship between Imposter Syndrome (IS) and class gender ratios in osteopathic medical schools as well as pre-matriculation assessments.

OBJECTIVES

Objective 1: Evaluate the relationship of IS and medical school class gender ratios. The influence of overall male to female ratio in a medical school class on the prevalence of IS is still unknown. This study will examine this ratio and the prevalence rate of IS in osteopathic medical school classes.

Objective 2: Investigate the relationship of IS and common medical school admissions standards. Two common factors assessed are MCAT performance and cumulative science GPA. This study will examine the relationship of IS, MCAT and science GPA.

METHODS

To evaluate the relationship of IS and medical school class gender ratios the authors evaluated different gender setups defined inherently by the class composition in nine osteopathic medical college campuses (A.T. Still, Burrell, Des Moines, Idaho, Ohio University, Rocky Vista CO, Rocky Vista UT, Touro NY and West Virginia). The authors examined responses from students belonging to 4 student classes where gender ratios are different. Among all these schools, the largest gender ratio was 81% males/19% females. Data was examined by a Generalized Linear Model that included the interaction effect of College x Campus x Class x Gender which isolates the effect defined in our aim. Imposter Syndrome was defined as present in subjects who answered yes to 5 or more targeted questions that defined their self-perception among their peers using the young imposter scale survey.

To investigate the relationship of IS and common medical school admission standard scores the authors evaluated the IS presence per subject and their relationship with their SciGPA and MCAT scores. This effect was analyzed by evaluating the chance of having IS present or absent. A logistic regression model was used that included the SciGPA and MCAT scores as main effects and the SciGPA x MCAT scores as an interaction effect.

Table 1. Pairwise comparison test by gender, college, campus and graduating class of Imposter Syndrome Least Square Mean estimate differences. CLL and CLU are 95% confidence interval limits. Statistically significant pairwise comparisons are shown in Bold.

College	Campus	Class	Male	Female	Estimate Difference	Lower	Upper	Pr > t
ATStill	Kirksville	2022	62	38	0.125	-0.341	0.591	0.5985
ATStill	Kirksville	2023	52	48	0.0476	-0.3956	0.4909	0.833
Burrell	New Mexico	2020	54	46	-0.6667	-1.5175	0.1841	0.1243
Burrell	New Mexico	2022	49	51	0	-0.6016	0.6016	1
Burrell	New Mexico	2023	50	50	-0.4167	-0.8827	0.0493	0.0796
DMUCOM	low a	2022	56	44	0.2582	-0.1007	0.6172	0.1582
DMUCOM	low a	2023	58	42	0.3333	-0.2683	0.9349	0.2769
ICOM	Idaho	2022	65	35	-0.0833	-0.45	0.2833	0.6555
ICOM	Idaho	2023	62	38	0.4094	0.0775	0.7413	0.0157
OhioU	Ohio	2022	51	49	0.2778	-0.2823	0.8378	0.3304
RVU	Colorado	2020	50	50	0.5188	0.2095	0.8282	0.001
RVU	Colorado	2021	64	36	-0.0756	-0.412	0.2607	0.6589
RVU	Colorado	2022	45	55	0.3049	-0.0079	0.6177	0.056
RVU	Colorado	2023	51	49	0.0747	-0.1968	0.3463	0.5892
RVU	Utah	2021	81	19	0.2532	-0.1512	0.6577	0.2192
RVU	Utah	2022	69	31	0.3934	0.1256	0.6612	0.0041
RVU	Utah	2023	68	32	0.1429	-0.1062	0.3919	0.2604
Touro	New York	2022	51	49	0	-0.3805	0.3805	1
Touro	New York	2023	44	56	0.2571	-0.1695	0.6838	0.2369
WVSOM	Lewisburg	2020	52	48	0.1758	-0.2611	0.6128	0.4296
WVSOM	Lewisburg	2021	46	54	0.6667	-0.1841	1.5175	0.1243
WVSOM	Lewisburg	2022	52	48	0.6389	0.0788	1.199	0.0254
WVSOM	Lewisburg	2023	55	45	-0.1118	-0.4832	0.2597	0.5547

Table 2. Analysis of Maximum Likelihood Estimates of Imposter Syndrome

Parameter	Estimate	Standard Error	Wald's χ^2	P > χ^2
Intercept	22.7658	23.6795	0.9243	0.336344
SciGPA	-6.1597	6.6628	0.8547	0.355231
MCAT	-0.0482	0.0471	1.0174	0.306095
SciGPA*MCAT	0.0128	0.0133	0.9388	0.332586

Young Imposter Scale (Yes/No)

1. Do you secretly worry that others will find out that you're not as bright and capable as they think you are?
2. Do you sometimes shy away from challenges because of a nagging self-doubt?
3. Do you tend to chalk your accomplishments up to being a "fluke," "no big deal" or the fact that people just "like" you?
4. Do you hate making a mistake, being less than fully prepared, or not doing things perfectly?
5. Do you tend to feel crushed even by constructive criticism, seeing it as evidence of your "ineptness?"
6. When you do succeed, do you think "Phew, I fooled them this time, but I may not be so lucky next time?"
7. Do you believe that other people (students, colleagues, competitors) are smarter and more capable than you?
8. Do you live in fear of being found out, discovered, or unmasked?

RESULTS

The interaction effect was statistically significant (P=0.000977), which confirms the existence of imposter syndrome differences across colleges, campuses, and graduating classes. Four out of the twenty-three comparisons had significant difference in IS between males and females, indicating that college, campus and class play a role in IS. The probability of having four out of twenty-three comparisons to be significant is 0.02088, which is significant. Pairwise cohort difference estimates and p-values by gender, class and campus are presented in Table 1.

Independent of gender and class ratios, neither SciGPA nor MCAT score were statistically significant as predictors of IS (Full model P=0.516595). Maximum likelihood estimates and p-values are displayed in Table 2.

CONCLUSION

Conclusion 1: IS is more common among female osteopathic medical students. This is in line with what previous studies have shown in allopathic medical schools¹. However, when broken down by class and campus the results showed no significant relationship between class ratios and the likelihood of females to experience IS. Based off this observation, the authors cannot conclude that the class ratio plays a role in the prevalence of IS among female osteopathic medical students.

Conclusion 2: Based on the data received and its statistical evaluation, the authors found that there is no significant correlation between IS, MCAT performance, and cumulative science GPA. This supports the idea that IS could be more of a psychological phenomenon, separate from student performance.

Future Plans: The current analysis subdivides responses into categories based on college, campus, and graduating class. Because the number of responses from some categories was small, the authors instead plan to group responses based on similar class gender ratios. These groups of responses based on campus gender ratio will then be analyzed against the incidence of IS to obtain more conclusive results.

REFERENCES

1. 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. doi:https://doi.org/10.5116/ijme.5801.eac4
2. Ladonna, K. A., Ginsburg, S., & Watling, C. (2018). Rising to the Level of Your Incompetence. *Academic Medicine*, 93(5), 763-768. doi:10.1097/acm.0000000000002046
3. Legassie, J., Zibrowski, E. M., & Goldszmidt, M. A. (2008). Measuring Resident Well-Being: Impostorism and Burnout Syndrome in Residency. *Journal of General Internal Medicine*, 23(7), 1090-1094. doi:10.1007/s11606-008-0536-x