Publication characteristics of successful male and female applicants into integrated plastic surgery

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Introduction

Integrated plastic surgery residency continues to be a top competitive specialty among Doctors of Medicine (MD) and Doctors of Osteopathic Medicine (DO) students.[1] There was a total of 207 residency spots with 332 applicants applying for integrated plastic surgery in the 2023 match, giving a match rate of 62%.[2] One must display qualities that distinguishes them from other applicants when applying into the integrated plastic surgery route. These include top USMLE scores, AOA membership, and appreciable research experiences across all applicants.[3] This provides challenges for DO students as there is lower research production and recent changes of USMLE Step 1 to pass/fail.[4] For first year integrated plastic surgery residents matriculating in 2022-2023, the average number of abstracts, presentations, and publications was 28.7.[5] This illustrates the possible overinflation when determining the number of publications needed to make an applicant competitive as it lacks distinction from abstracts and presentations.

Objectives

To determine the publication characteristic of successful male and female applicants into integrated plastic surgery from 2018 to 2023

Methods

The study consisted of a retrospective cohort of integrated plastic surgery applicants who matriculated between 2018 and 2023. All demographic data was collected from each program's website and when a resident's data could not be found they were removed from analysis. Publication data including the manuscript's topic (plastic surgery or non-plastic surgery), type of manuscript (article or review), and author position (first, second, or other) from six months prior to matriculation into residency was obtained from SCOPUS. Data are reported as a median with interquartile range and was analyzed using either a Wilcoxon Rank test or an uncorrected Kruskal-Wallis test. The Spearman's correlation was utilized to calculate all correlations.

Results

Table 1: Baseline Demographics

	Totals	Match Year						Institutional Setting	
Category	n (%)	2018	2019	2020	2021	2022	2023	Affiliated Hospital	University Hospital
Total Residents	942 (100%)	145 (100%)	156 (100%)	159 (100%)	160 (100%)	162 (100%)	160 (100%)	109 (100%)	832 (100%)
Trainee Characteristics									
Medical Degree									
Osteopathic	8 (0.8%)	1 (0.7%)	3 (1.9%)	1 (0.6%)	1 (0.6%)	1 (0.6%)	1 (0.6%)	4 (3.7%)	4 (0.5%)
Allopathic	922 (97.9%)	142 (97.9%)	151 (96.8%)	156 (98.1%)	155 (96.9%)	160 (98.8%)	158 (98.8%)	105 (96.3%)	817 (98.2%)
MD/PhD	12 (1.3%)	2 (1.4%)	2 (1.3%)	2 (1.3%)	4 (2.5%)	1 (0.6%)	1 (0.6%)	0 (0%)	12 (1.4%)
Sex									
Female	504 (53.5%)	69 (47.6%)	75 (48.1%)	72 (45.3%)	96 (60%)	92 (56.8%)	100 (62.5%)	54 (49.5%)	450 (54.1%)
Male	438 (46.5%)	76 (52.4%)	81 (51.9%)	87 (54.7%)	64 (40%)	70 (43.2%)	60 (37.5%)	55 (50.5%)	383 (46%)

Note: Percentages are listed by column, calculated as the proportion of the `Total Residents` (row 1) in each column

Table 2: Publication Trends

	Match Year						Kruskal-Wallis	Spearman's Rank-Correlation	
Category	2018	2019	2020	2021	2022	2023	p-value[1a]	rho[*]	p-value[1]
Total Publications	0 (2)	1 (2)	1 (3)	1 (3)	2 (5)	2 (3)	<0.001	0.25	<0.001
Trainee Characteristics									
Medical Degree									
Osteopathic	0 (0)	0 (0.5)	1 (0)	0 (0)	2 (0)	0 (0)	=0.394	0.25	=0.545
Allopathic	0 (2)	1 (2)	1 (3)	1 (3)	2 (5)	2 (3)	<0.001	0.26	<0.001
MD/PhD	2.5 (0.5)	6 (2)	0.5 (0.5)	3 (1.75)	2 (0)	4 (0)	=0.235	-0.01	=0.982
Sex									
Female	0 (2)	0 (2.5)	1 (2)	1 (3)	1 (4)	2 (3)	<0.001	0.24	<0.001
Male	0.5 (2)	1 (2)	1 (3)	2 (4)	2.5 (4)	2 (4)	<0.001	0.3	<0.001
Publication Characteristics									
Topic									
Plastic Surgery	0 (1)	0 (1)	0 (1)	0 (2)	0.5 (2)	1 (2.25)	<0.001	0.21	<0.001
Non-Plastic Surgery	0 (1)	0 (1)	0 (1)	0 (1)	1 (1)	1 (2)	<0.001	0.16	<0.001
Journal									
Plastic Surgery	0 (0)	0 (0)	0 (1)	0 (1)	0 (1)	0 (2)	<0.001	0.19	<0.001
Non-Plastic Surgery	0 (1)	0 (1.25)	1 (1)	1 (2)	1 (2)	1 (3)	<0.001	0.2	<0.001
Author									
First	0 (0)	0 (1)	0 (1)	0 (1)	0 (1)	0 (1.25)	<0.001	0.19	<0.001
Second	0 (0)	0 (1)	0 (1)	0 (1)	0 (1)	0 (1)	<0.001	0.15	<0.001
Other	0 (1)	0 (1)	0 (1)	0 (1.25)	1 (2)	1 (2)	<0.001	0.2	<0.001
Type									
Article	0 (2)	1 (2)	1 (2)	1 (3)	1.5 (3)	2 (4)	<0.001	0.23	<0.001
Review	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (1)	<0.001	0.2	<0.001

Note: Values in table presented as `Median (Interquartile Range)`;
[1] Statistical significance defined as $p < 0.05$;
[a] Kruskal-Wallis rank sum test;
[*] ≥ 0.10 = Weak | ≥ 0.30 = Moderate | ≥ 0.50 = Strong

Table 3: Trainee Comparison by NIH Funding and Match Location

	NIH Funding		Wilcoxon	Match Location		Wilcoxon
Category	Not Top 20	Top 20	p-value[1]	Home Program	Not Home Program	p-value[1]
Total Publications	1 (3)	2 (3)	<0.001	1 (3)	1 (3)	=0.894
Trainee Characteristics						
Medical Degree						
Osteopathic	0 (1)				0 (1)	
Allopathic	1 (3)	2 (3)	<0.001	1 (3)	1 (3)	=0.930
MD/PhD	2.5 (2.5)	3 (3.75)	=0.570	2 (2.5)	3 (2.75)	=0.439
Sex						
Female	1 (2)	2 (3)	<0.001	1 (2)	1 (3)	=0.873
Male	1 (3)	2 (2.5)	=0.107	1 (3)	1 (3)	=0.786

Note: Values in table presented as `Median (Interquartile Range)`;
[1] Statistical significance defined as $p < 0.05$; p-values calculated using the Wilcoxon rank sum (Mann-Whitney) test

Discussion

When examining male vs female plastic surgery residents, there was an increase in publications seen in both genders over the 2018 to 2023 period. This upward trend in productivity amongst genders could be contributed to multiple factors including USMLE Step 1 change to pass/fail and the continued increased demand of research in the field of plastic surgery.[3] While research productivity between genders was comparable, male plastic surgery applicants demonstrated a higher number of total publications. When exclusively analyzing plastic surgery related publications, male residents also produced a larger publication output in this category. Additionally, females who attended a top 20 NIH funded program produced more manuscripts compared to females who did not. This may be related to the greater opportunities for research and emphasis to produce research at these programs.

Conclusion

Over the last several years, there has been an increased number of publications by successful male and female applicants into plastic surgery residencies. Despite there being little difference amongst the genders when total publications were considered, a gap still exists between male and female applicants.

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