

Publication Trends Among Internal Medicine Residents, Fellows, and Graduates and Its Relationship to Future Academic Achievement



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Objectives and Hypothesis

Medical research is essential for establishing evidence-based care and furthering clinical practice knowledge for the success of physicians. For example, research is considered a scholarly activity by the American College of Graduate Medical Education and is a requirement during residency(1). Furthermore, research is used as a tool to measure academic success given that it allows for a qualitative measure for residency and fellowship applications. Publication trends among internal medicine have previously been studied(2,3); however, our follow-up study also adjusts for gender when comparing research success. Our primary objective is to assess the influence that research in medical school has on residency success by analyzing fellowship placement, h-index scores, and continued research success measured by publications.

METHODS

Using Doximity residency navigator, we reviewed internal medicine graduates from 50 randomly sampled residency programs. From each included program, publically available graduate records were obtained and included for identification of each graduate. After extracting our list of graduates, each graduate was searched on SCOPUS for degree, gender, fellowship pursued, h-index, academics pursued, and publications. Microsoft Excel and Stata 15.1 were used for all statistical analysis functions.

Table 1: Characteristics of Internal Medicine Residency Graduates

Characteristics (N=328)	No. (%)	[95% CI]
Graduation year		
2013	118 (36.0)	[30.8-41.2]
2014	112 (34.1)	[29.0-39.3]
2015	98 (29.9)	[24.9-34.8]
Degree earned		
MD	284 (86.6)	[82.9-90.3]
DO	37 (11.3)	[7.9-14.7]
MBBS/IMG	7 (2.1)	[0.6-3.7]
Gender		
Male	189 (57.6)	[52.3-63.0]
Female	139 (42.4)	[37.0-47.8]
Fellowship		
Allergy and Immunology	4 (1.2)	[0.0-2.4]
Cardiology	34 (10.4)	[7.1-13.7]
Endocrinology, Diabetes, and Metabolism	11 (3.4)	[1.4-5.3]
Gastroenterology and Hepatology	16 (4.9)	[2.5-7.2]
General, Geriatric, and Hospitalist	11 (3.4)	[1.4-5.3]
Hematology, Oncology	21 (6.4)	[3.8-9.1]
Infectious Disease	17 (5.2)	[2.8-7.6]
Interventional Cardiology	6 (1.8)	[0.4-3.3]
Nephrology	18 (5.5)	[3.0-8.0]
Neurology	6 (1.8)	[0.4-3.3]
Palliative Medicine	5 (1.5)	[0.2-2.9]
Pulmonary Disease, Critical Care	27 (8.2)	[5.3-11.2]
Research	4 (1.2)	[0.0-2.4]
Rheumatology	6 (1.8)	[0.4-3.3]
Other †	16 (4.9)	[2.5-7.2]
No fellowship pursued	126 (38.4)	[33.2-43.7]
Post-residency career		
Academic Medicine	79 (24.1)	[19.5-28.7]
Private practice	249 (75.9)	[71.3-80.5]

Abbreviations: MD; Medical Doctor, DO; Doctor of Osteopathic Medicine, IMG; International Medical Graduate
 † Advanced Heart Failure and Transplant Cardiology (n=1), Clinical Cardiac Electrophysiology, Cardiology (n=1), Medical Genetics (n=1), Oncology (n=1), Radiology (n=2), Sleep Medicine (n=2), Sports Medicine (n=1), Vascular Neurology (n=1), multiple (n=7)

Results

Our initial search of internal medicine residency programs yielded 530 programs of which we randomly sampled 50 programs. Among the 50 programs, 328 graduates were identified and included in our analysis. Over half of our sample were males with the most common fellowship pursued being cardiology (Table 1). Graduates with first authorship publication prior to residency were more likely to pursue a fellowship or go into academic medicine (Table 2).

Research Articles Analyzed

Table 2: Research Characteristics by Fellowship, Career Path, and Gender

Characteristics	Mean Publications (SD)	P value	Mean First Author Publications (SD)	P value	Mean h-index (SD)	P value
Sample						
Overall (n=1383)	4.2 (8.0)	-	0.6 (1.8)	-	1.7 (2.6)	-
Fellowship pursued						
Yes (n=202)	5.8 (9.2)	0.001*	2.4 (4.3)	0.001*	2.3 (2.8)	0.001*
No (n=126)	1.6 (4.5)		0.6 (1.9)		0.9 (1.9)	
Career path						
Academic Medicine (n=79)	9.3 (13.2)		3.9 (6.3)		3.3 (3.8)	
Private practice (n=249)	2.6 (4.2)	0.001*	1.0 (1.9)	0.001*	1.2 (1.7)	0.001*
Gender						
Male (n=189)	4.6 (9.4)		1.9 (4.4)		1.8 (2.8)	
Female (n=139)	3.7 (5.5)	0.35	1.5 (2.5)	0.41	1.7 (2.2)	0.85

Abbreviations: SD; Standard deviation

*denotes p<0.05

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Summary

Our study found that graduates with primary author publication before residency were more likely to go into academic medicine or pursue a fellowship after internal medicine residency. Given that Internal medicine provides several options following residency, research provides a qualitative measure of academic performance and future success. Our study highlighted no difference among gender and future career success. These results are comparable to other studies(2,3). In conclusion, total publications, first author publication, and h-index scores independently indicate a significant positive correlation in pursuing a fellowship or academic medicine after residency.

Study Characteristics

