

Publication Trends Among General Surgery Residents, Fellows, and Graduates and Its Relationship to Future Academic Achievement

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Introduction

Medical research is considered a core component of Accreditation Council for Graduate Medical Education (ACGME) residency programs¹. Over half of general surgery residency programs offer dedicated research years and research opportunities². Through conducting, evaluating, and applying medical research, physicians aim to improve the quality of care for patients and better health outcomes. However, the rate of research outcomes among general surgery residents remains unknown. Our study aims to determine associated factors that influence publication rates before, during, and after general surgery residency.

Methods

Our cross-sectional study included a random sample of 50 general surgery residency programs. Using each program's online website, publicly available records were obtained for residents that graduated in 2013-2015. Using a Google form, previous publication information, h-index, medical degree, and fellowship pursued were obtained for each graduate by searching Scopus and PubMed. Microsoft Excel functions were used to calculate descriptive statistics and 95% confidence intervals

Results

We identified 321 residency programs of which we randomly sampled 50 programs (figure 1). Among the 50 programs, only 30 were included. Of the 30 programs, 68 residents were analyzed for sample characteristics and publication rates. Among the 68 graduated residents, the majority, 31 (45.6%) had between 1-5 publications. Of the 68 residents, most pursued a fellowship in Minimally Invasive Surgery (14/68; 20.6%). Most research outcomes reported were during residency with a total of 150 (of 321; 46.7%) publications. Of the 321 total publications recorded, the lowest reported median was before Residency.

Figure 1: Included General Surgery Programs and Residents

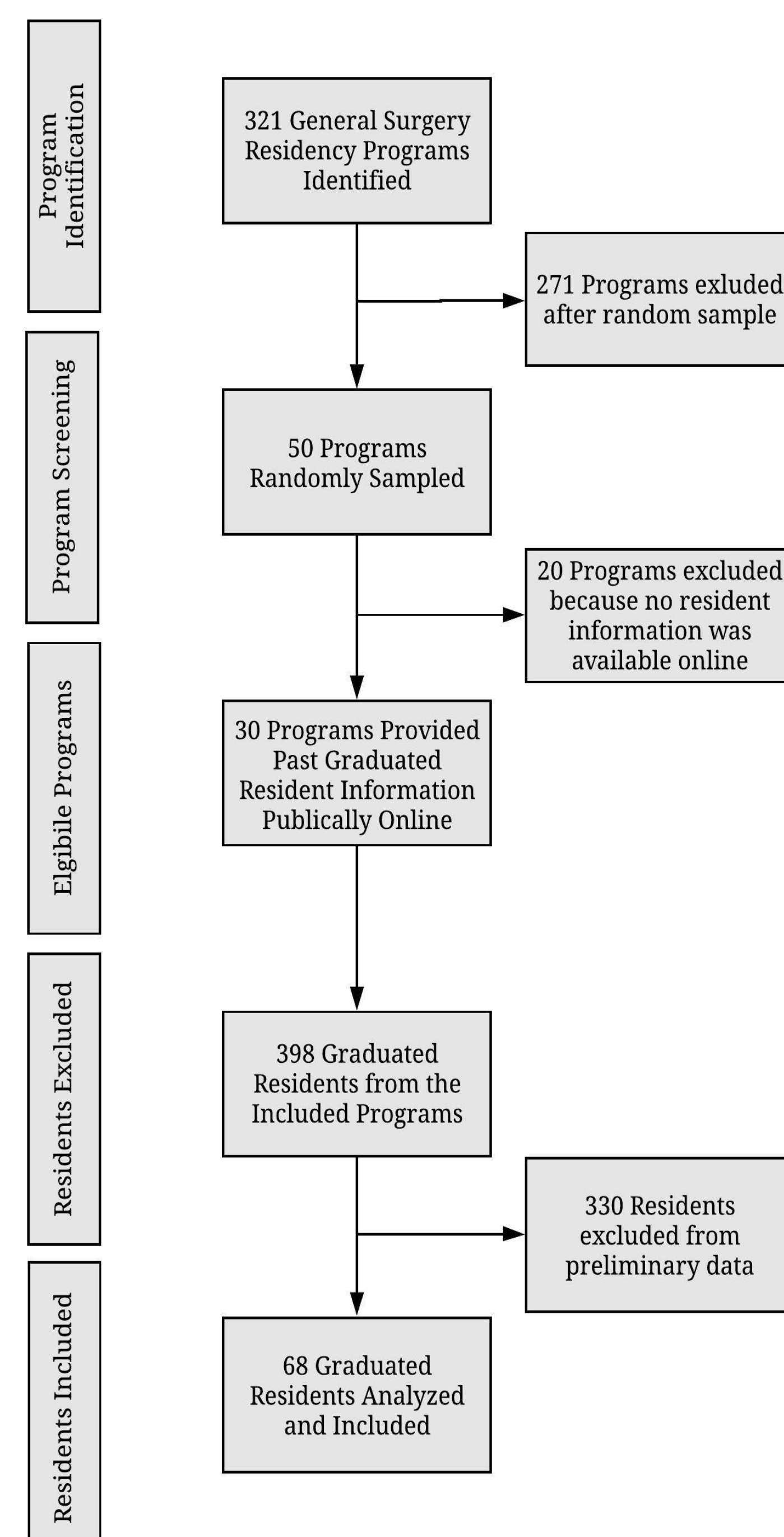


Table 1: Sample Characteristics

Characteristics	Total N=68 (%)	[95% CI]
Sex		
Male	40 (58.8)	[47.1-70.5]
Female	28 (41.2)	[29.5-52.9]
Medical Degree Obtained		
MD	66 (97.1)	[93.0-100.0]
DO	1 (1.5)	[0.0-4.3]
MBBS	1 (1.5)	[0.0-4.3]
H-Index		
0	12 (17.6)	[8.6-26.7]
1-5	44 (64.7)	[53.3-76.1]
6-15	12 (17.6)	[8.6-26.7]
Publications		
0	12 (17.6)	[8.6-26.7]
1-5	31 (45.6)	[33.8-57.4]
6-10	14 (20.6)	[11.0-30.2]
11-20	7 (10.3)	[3.1-17.5]
21-30	3 (4.4)	[0.0-9.3]
31-40	1 (1.5)	[0.0-4.3]
Fellowships		
Advance GI Surgery	2 (2.9)	[0.0-7.0]
Breast Surgery	2 (2.9)	[0.0-7.0]
Cardiothoracic	3 (4.4)	[0.0-9.3]
Colorectal	6 (8.8)	[2.1-15.6]
Endocrine	1 (1.5)	[0.0-4.3]
Minimally Invasive	14 (20.6)	[11.0-30.2]
Pediatric	1 (1.5)	[0.0-4.3]
Plastic	4 (5.9)	[0.3-11.5]
Surgical Critical Care	6 (8.8)	[2.1-15.6]
Surgical Oncology	4 (5.9)	[0.3-11.5]
Transplant	1 (1.5)	[0.0-4.3]
Vascular	7 (10.3)	[3.1-17.5]
Multiple	3 (4.4)	[0.0-9.3]
No Fellowship pursued	15 (22.1)	[12.2-31.9]

Summary

Our study indicated that research outcomes were more prevalent during residency when compared to research outcomes before and after residency. Given that research remains a core part of ACGME general surgery residency programs, it is important for residents to continue progressing their scientific knowledge through continued research. Several studies looking at the effect of research experience during residency found that research overlaps with better medical practice³. In conclusion, publication rates remain the highest during residency.

Table 2: Mean and median publication rates for residents

Graduation Year	Before Residency		
	Mean	Median	# of Publications
2013	3.1	1	43
2014	2.25	2	18
2015	3.5	3.5	2
Total	2.8	1	63
	During Residency		
	Mean	Median	# of Publications
2013	3.9	3.9	81
2014	4.1	3	69
2015	0	0	0
Total	3.9	3	150
	After Residency		
	Mean	Median	# of Publications
2013	4.5	4.05	90
2014	3.6	2	18
2015	0	0	0
Total	4.1	2.5	108

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