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Education

The role research gap years play in a successful dermatology match

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Abstract

Background A new trend includes taking a dedicated year away from medical school to complete a research fellowship. There is minimal data on the benefit of a gap year. We aimed to identify if a gap year makes a dermatology applicant more successful in The Match.

Methods Dermatology applicants who applied to Mayo Clinic Arizona for the 2018–2019 application cycle and Mayo Clinic Rochester, Arizona, and Florida for the 2019–2020 application cycle were surveyed.

Results In total, 291 dermatology applicants completed the initial survey, and 236 completed the follow-up survey. Ninety applicants took a gap year, 198 applicants did not. There was no significant difference in match rates. When comparing match rates at top dermatology residency programs, 40.6% of gap-year applicants matched to these residencies versus 19.0% of no gap-year applicants ($P < 0.01$).

Conclusion Applicants should weigh the opportunity costs before pursuing research gap years as they may not be universally helpful. Applicants who want to match at a top dermatology program may benefit from a research gap year. This data may have limited generalizability outside of the United States.

Introduction

Dermatology residency remains one of the most competitive. In the 2018 cycle, dermatology applicants had the highest median Step 1 and Step 2 CK scores and the second lowest match rate.[1,2] Besides exam scores, applicants are pressured to excel with grades, obtain meaningful mentorships and letters of recommendation, volunteer, pursue away rotations, and publish.[3–5] From 2007 to 2018, matching applicants increased their publications/research experiences by more than 250%.[6]

A newer trend includes taking a dedicated year away from medical school to complete a research fellowship.[5] In integrative plastic surgery, research fellowships improved candidates' chances of matching.[7] Further, in other competitive specialties, applicants reapplying to a specialty are at a significant disadvantage.[8] This suggests some applicants may want to consider strengthening their application before their initial application cycle. Taking a research gap year comes at significant expense to the applicant. It often includes moving cities, taking unpaid positions, accruing interest on student loans, difficulties obtaining healthcare coverage, and the opportunity cost of delaying a physician salary by another year. This is on top of the cost of interviewing for competitive specialties.[9] Currently, there is minimal data to guide students and their mentors on who would benefit from a gap year and if it improves matching odds.

We aimed to identify if a gap year makes a dermatology applicant more successful in The Match. Our secondary aims included identifying if there were particular subgroups that benefited from a research gap year.

Materials and methods

The Mayo Clinic Institutional Review Board deemed this study exempt. All 475 applicants who applied to Mayo Clinic

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Dermatology Residency in Arizona during the 2018–2019 cycle were emailed 3 weeks prior to Match an initial survey that obtained demographic, gap year, and application information. A follow-up survey was sent to applicants who completed the first survey on Match Day obtaining match data (Figure S1). The survey was repeated for the 2019–2020 cycle and included all 629 applicants who applied to the dermatology programs at Mayo Clinic Rochester, Arizona, and Florida in the manner described above. Step 2 scores were collected in 2019–2020. For publications, applicants were asked to count only published or accepted manuscripts, not abstracts, posters, conference presentations, or submitted manuscripts. Top dermatology programs (TDPs) were defined as the combination of the top 20 programs by Namavar et al.[10] and top 20 programs by reputation on Doximity© as of April 18, 2019 (Table S1).

Statistical analysis

Descriptive statistics were calculated for variables of interest. Group comparisons were examined using chi-square test for categorical variables and Kruskal–Wallis tests for continuous variables of interest. Comparisons included demographic variables, gap year versus no gap year, grouped Step 1 scores and Step 2 scores, matching to a TDP, and matching at gap-year institution. All applicants who responded were included in the analysis. If an applicant did not complete the second survey, they were excluded from the analysis on matching. If an applicant skipped a question, they were excluded from data related to that question.

Results

In total, 149 dermatology applicants completed the initial 2019 survey (31.4% response rate), and 112 completed the follow-up survey (75.2%). For 2020, 142 completed the initial survey (22.6%), and 124 completed the follow-up survey (87.3%; Table 1). The majority were females (61.9%). The racial breakdown was 69.9% Caucasian, 23.7% Asian, 5.4% African American, 0.4% American Indian/Alaska Native, and 0.7% Native Hawaiian/Pacific Islander. Eight percent identified as Hispanic/Latino. In total, 31.3% of applicants took a gap year, 78.7% of those reported the purpose was to complete a research fellowship.

Table 1 Demographics, medical school performance, research, and gap years (n = 291)

Age	
Mean (SD)	27.6 (2.99)
Median (IQR)	27.0 (26.0, 29.0)
Gender	
Male	37.8%
Female	61.9%
Prefer not to say	0.3%
Race	
Caucasian	69.9%
Asian	23.7%
African American	5.4%
Native Hawaiian	0.7%
American Indian/Alaska Native	0.4%
Ethnicity	
Non-Hispanic/Non-Latino	91.7%
Hispanic/Latino	8.3%
Debt at graduation in U.S. dollars	
Mean (SD)	$148,130 ($134,672)
Range	$0–$500,000
Median (IQR)	$157,000 ($0.0, $250,000)
Step 1 score	
Mean (SD)	246.9 (14.49)
Range	196–270
Median (IQR)	250 (241.0, 257.0)
Total publications/accepted manuscripts	
Mean (SD)	7.5 (9.14)
Range	0-85
Median (IQR)	5 (3.0, 9.0)
Total first-author publications/accepted manuscripts	
Mean (SD)	4.2 (5.03)
Range	0–40
Median (IQR)	3 (1.0, 5.0)
Gap year applicants	
Took a gap year	31.3%
Research	78.7%
Volunteer/Humanitarian Mission	4.5%
Personal	3.4%
Other	13.5%
Match in dermatology?	
Yes	88.1%

IQR, interquartile range; SD, standard deviation.

Gap year versus no gap year

Applicants who completed a gap year were 1 year older, on average 28.5 (SD = 3.55) versus 27.2 (SD = 2.55, Table 2, $P < 0.01$). There was no significant difference for gender, ethnicity, marital status, children, debt, third-year clinical honors, or Step 2 score ($P > 0.05$). The average Step 1 score was lower for gap-year applicants, 244.5 (SD = 15.0) versus 248.1 (SD = 14.19, $P = 0.03$). Eighty-eight percent of gap-year applicants had a home dermatology program versus 73.7% of no gap-year applicants ($P < 0.01$). The median number of publications/accepted manuscripts and first-author publications/accepted manuscripts for gap-year applicants was 8.0 (IQR = 5.0, 16.0) and 5.0 (IQR = 3.0, 8.0) versus 4.0 (IQR = 2.0, 7.0) and 2.0 (IQR = 1.0, 4.0) for no gap-year applicants ($P < 0.01$). There was no difference in match rates between gap-year versus no gap-year applicants (87.8% vs. 88.0%, $P = 0.98$). Excluding applicants who did not disclose their research fellowship or matching institution, 17.8% of matching research gap-year applicants matched to the institution of their research fellowship. When comparing match rates at top dermatology residency programs, 40.6% of gap-year applicants matched to these residencies versus 19.0% of no gap-year applicants ($P < 0.01$). Of those who completed a gap year and matched at a TDP, 78.9% attended a gap year at a

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Table 2 Comparing gap-year applicants to no gap-year applicants

	Gap year (*n* = 90)	No gap year (*n* = 198)	*P* value
Age			
Mean (SD)	28.5 (3.55)	27.2 (2.55)	<0.01
Range	23–47	23–40	
Median (IQR)	28.0 (27.0, 29.0)	26.0 (26.0, 28.0)	
Gender			
Male	34 (37.8%)	76 (38.4%)	0.33
Female	55 (61.1%)	122 (61.6%)	
Prefer not to say	1 (1.1%)	0 (0.0%)	
Race			
Caucasian	47 (56.0%)	145 (75.5%)	<0.01
Asian	29 (34.5%)	37 (19.3%)	
African American	5 (6.0%)	10 (5.2%)	
Native Hawaiian	2 (2.4%)	0 (0.0%)	
American Indian/Alaska Native	1 (1.2%)	0 (0.0%)	
Ethnicity			
Non-Hispanic/No-Latino	76 (90.5%)	175 (92.1%)	0.65
Hispanic/Latino	8 (9.5%)	15 (7.9%)	
Debt at graduation in U.S. dollars			
Mean (SD)	$155,036 ($143,239)	$144,664 ($131,222)	0.84
Range	$0–$500,000	$0–$500,000	
Median (IQR)	$152,000 ($0; $250,000)	$160,000 ($0–$250,000)	
Step 1 Score			
Mean (SD)	244.5 (14.97)	248.1 (14.19)	0.03
Range	206–271	196–270	
Median (IQR)	245.5 (235.5, 255.5)	251.0 (244.0, 257.0)	
Step 2 Score			
Mean (SD)	257.6 (14.55)	254.0 (13.26)	0.15
Range	213–280	219–281	
Median (IQR)	260.0 (251.0, 267.0)	255.5 (246.0, 263.0)	
Publications/accepted manuscripts			
Mean (SD)	11.4 (10.91)	5.9 (7.20)	<0.01
Range	0–85	0–60	
Median (IQR)	8.0 (5.0, 16.0)	4.0 (2.0, 7.0)	
First-author publications/accepted manuscripts			
Mean (SD)	6.4 (5.85)	3.3 (4.30)	<0.01
Range	0–40	0–40	
Median (IQR)	5.0 (3.0, 8.0)	2.0 (1.0, 4.0)	
Away rotations			
Mean (SD)	2.2 (1.40)	2.8 (2.04)	0.03
Range	0–6	0–12	
Median (IQR)	2.0 (1.0, 3.0)	3.0 (2.0, 3.0)	

IQR, interquartile range; SD, standard deviation.

TDP versus 21.1% who completed their gap year elsewhere ($P = 0.03$). Comparing gap-year applicants who matched at a TDP to those who matched elsewhere, mean Step 2 scores were higher (265.2 [SD = 11.0] vs. 252.7 [SD = 12.4], $P < 0.01$), and Step 1 scores were not significantly different.

Discussion

The primary aim of this study was to determine if gap years improve an applicant's odds of matching into dermatology. Overall, gap-year applicants had no difference in match rates compared with no gap-year applicants. However, applicants seeking to match at a top dermatology academic residency program may benefit from a research gap year.

Not surprisingly, gap-year applicants had more publications. Unfortunately, the National Resident Matching Program's (NRMP) data contain both unfinished (in preparation and submitted) projects and completed (accepted and published) projects. This makes it difficult to discern how many completed and first-author project applicants should target. Gap-year applicants

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had double the number of completed and first-author projects. The median number of publications for matching gap-year applicants was eight, whereas matching no gap-year applicants was four. There was no difference in publications between matching versus nonmatching gap-year applicants and matching versus nonmatching no gap-year applicants. A small number of respondents reported high numbers of publications, up to 85 for one respondent who took a gap year. These high values likely influence the mean publication rates observed.

Gap-year applicants had on average lower Step 1 scores, not Step 2 scores. The difference between the two groups however was 3.6 points. The standard deviation for Step 1 scores is 19–20 points for years 2018 and 2017, respectively. We suspect that this represents a statistically significant but not relevant difference in Step 1 scores. Additionally, Step 1 numerical scores will soon be replaced with a pass–fail system. Future research will be needed on how this change affects gap-year applicants. Within plastic surgery, it is thought that programs will use Step 2 CK scores to screen applicants, applicants will be prioritized from prestigious medical schools, and research will hold a higher value.[11]

We suspect a cohort, with competitive step scores, may benefit from a research fellowship. Gap-year applicants were greater than twice as likely to match at a TDP. Reputation or experience appears to be important as 78.9% of gap-year applicants who matched at a TDP completed their research fellowship at a TDP. There was no difference in publications between gap-year applicants who matched at TDP versus non-TDP, further suggesting the reputation of the research fellowship institution is important. Completing a research fellowship, however, does not solidify a position at that institution; only 17.9% of applicants matched to the institution where they completed their research fellowship. Applicants were more likely to pursue a gap year if they had a home dermatology program, suggesting mentors may play a role in applicants' decisions. Research fellowships may also be in the self-interest of these academic institutions, as research fellows are a dedicated, inexpensive labor force. Additionally, applicants may benefit and take a gap year for personal enrichment including taking time to travel, be with family, exercise, etc., in addition to the time spent performing research and propelling their future careers. This away from the rush of medical school can give medical students time to reflect on how they want to shape their future professional lives. Last, applicants should be aware that programs take geographic connection to their program into account when formulating their rank list.[12]

Limitations

This was a survey-based study with a low response rate; however, the survey was performed over two consecutive years and across three residency programs. This study may overestimate the percent of applicants who undertake a research year if they were more likely to respond to the survey. There were racial differences between GYA and non-GYA (Table 2), and further research is needed to evaluate these differences. NRMP presented similar data on step scores and the number of programs ranked, suggesting the generalizability of our data.[2] This data may have limited external validity outside of the United States.

Conclusion

Applicants should exercise some caution and weigh the opportunity costs before pursuing research gap years as they may not be universally helpful. One group that may benefit from a research fellowship is competitive applicants who want to match at a top dermatology program. Importantly, this group of applicants may consider pursuing research fellowship at a top dermatology program.

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Supporting Information

Additional Supporting Information may be found in the online version of this article:

Figure S1. Pre-match survey completed by applicants.

Table S1. Top dermatology programs*.

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