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Demographics, Trends, and Outcomes of Medical Student Presenters at National Plastic Surgery Conferences: A 10-year Analysis

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Background: Research is an increasingly substantial criterion for competitive applicants entering the plastic and reconstructive surgery (PRS) match. Presenting at conferences provides valuable networking opportunities, especially for students from schools without home-integrated PRS programs (no home program [NHP]). We sought to characterize the demographics and outcomes of student presenters at national PRS conferences.

Methods: Student presenters were obtained from annual meeting programs of 3 national PRS conferences from 2013 to 2022. Data were collected on demographics, presentation frequency, presenters' home and/or research institutions, and match outcomes using Doximity, residency webpages, and LinkedIn. The Pearson χ^2 test, unpaired *t* test, and the Pearson correlation coefficient were performed.

Results: Overall, 745 students delivered 1133 presentations with an approximate 13-fold increase during 10 years. Approximately 61% matriculated into an integrated PRS residency program. NHP presenters comprised 20%, with a 58% match rate, compared with 62% for students who had a home program (HP) ($P = 0.41$). Among NHP students, 53% researched externally at HP institutions, yielding a 70% match rate, compared with 44% for NHP students researching within their NHP institutions ($P = 0.005$). Delivering 1 presentation corresponded to a 50% match rate, compared with 76% for multiple presentations ($P < 0.0001$).

Conclusions: Presenting multiple times at national conferences is associated with a greater PRS match rate. NHP students have a higher likelihood of matching when collaborating with a separate HP institution. Rising volumes of student presentations at PRS conferences suggest that engaging in research, perhaps due to the importance of networking at conferences, may be integral to matching. *(Plast Reconstr Surg Glob Open 2025;13:e6648; doi: 10.1097/GOX.0000000000006648; Published online 4 April 2025.)*

INTRODUCTION

Medical students pursuing plastic and reconstructive surgery (PRS) are met with increasingly challenging research productivity recommendations for matriculating into residency.[1–3] As PRS is consistently deemed one of the most competitive specialties, even highly qualified candidates can be at risk for an unsuccessful match.[4,5] Nonetheless, with fewer measures of evaluation after the elimination of the scored step 1 examination, research has quickly become an area of performance that allows applicants to showcase their scientific talents without limits.[6–8] The significant rise in manuscript submissions to peer-reviewed journals during the COVID-19 pandemic, along with a steep increase in PRS matriculants' publications from 19.1 in 2020 to 28.4 in 2022, suggests that the pandemic likely exacerbated the "race to research," particularly among medical students.[2,9,10] Involvement in research also speaks to one's initiative, motivation, organizational skills, and other promising qualities that are desired when selecting incoming residents. For example, surgery trainees who present research more frequently

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are more likely to pursue a fellowship after residency, and those who attain additional degrees or complete a dedicated research year during residency are more academically productive as attendings.[11–13]

Although completion of research projects in the form of peer-reviewed publications remains the gold standard, we must not discount the value of oral and poster presentations in the conference setting. Presenting research to an audience lends the unique opportunity to momentarily be the expert in the room, which promotes opportunity for scientific discourse and future collaboration.[14] Availing opportunities to connect with attendings and residents at PRS conferences has become paramount in the climate of the PRS match in recent years. In a recent article, a medical student recounts that prioritizing attendance at national-level PRS conferences early in his career yielded connections that later earned him several publications, a laboratory internship, and long-lasting mentorships.[15] Furthermore, program directors have commonly cited applicant familiarity as a key determinant in evaluating residency applicants.[7] This can often grant a baseline advantage to a program's home medical students and can reciprocally disadvantage those who have no home program (NHP).[16] Other avenues for extended interactions with faculty, such as away rotations, have limited availability and often high costs, averaging upward of $4000 in 2021.[17–19] With this in mind, attending and presenting at conferences becomes an obvious choice for medical students who wish to build connections in the field, especially from an early start.

To date, very limited data exist on the demographics and outcomes of medical students who present research at PRS conferences.[20] A deeper understanding of their backgrounds can better inform program faculty when it comes to evaluating PRS applicants, and it can additionally reveal points of improvement in accessing research and conference opportunities. Furthermore, taking a closer look at the match outcomes of medical student presenters will guide prospective applicants in optimizing both their research involvement and networking practices. Our research closely examines NHP students, in particular, as they fundamentally lack exposure or access to PRS resources and are notably underrepresented in the current pool of PRS trainees.[21–23]

METHODS

Names of all medical students listed as presenting authors for oral and poster presentations were extracted from the 2013 to 2022 Academic Council of American Plastic Surgeons, American Association of Plastic Surgeons, and American Society of Plastic Surgeons (ASPS) annual meeting programs online. Presenting authors listed with a medical degree, as well as those determined to not be pursuing a medical degree at the time of presentation, were excluded. International and osteopathic medical students were also excluded.

The frequency of presentations per meeting, per year, and per individual was recorded. Doximity, LinkedIn, and residency program webpages were then used to determine if students had an integrated PRS residency program at their home institutions, any research affiliations to external institutions with home programs (HPs), and their match outcomes. If a student delivered at least 1 presentation in which the senior author was affiliated with an HP institution, they were considered to have research affiliations with that HP.

Presenters who did not match directly into an integrated PRS program as graduating senior medical students were considered unmatched applicants. Individuals who, at the time of data collection, had not yet graduated were excluded from data analyses on match outcomes.

Additionally, to study potential changes in presentation trends before and after the COVID-19 pandemic, a subanalysis was conducted, comparing presenters in 2013–2020 to those in 2021–2022. Students delivering their initial presentations before 2021 were grouped into the earlier cohort, even if subsequent presentations were delivered in 2021 or after.

A Pearson χ^2 test and an unpaired t test were applied to determine differences among groups in relation to the frequency of presentations, the presence of HPs at students' home institutions, and the time period of presentations. A Pearson correlation coefficient was used to delineate relationships between the frequency of conference presentations and PRS match rates.

Takeaways

Question: Do medical students benefit from attending national plastic and reconstructive surgery (PRS) conferences?

Findings: In reviewing the national PRS meetings from the years 2013 to 2022, there was an exceptional number of medical students, more likely to be from medical schools with a home PRS residency program, presenting research. Medical students who presented multiple times at these conferences were associated with a greater PRS residency match rate.

Meaning: When applying to PRS, medical students should engage in research with the goal of presenting multiple times at national conferences.

RESULTS

Volume of Presentations

A total of 1133 oral and poster presentations were delivered by medical students across 3 annual national PRS conferences from 2013 to 2022 (Table 1). There was an approximately 13-fold increase in the total volume of presentations during 10 years, with a sum of 36 presentations in 2013 and 465 presentations in 2022 (Fig. 1). The ASPS conferences hosted the greatest number of medical student presentations, totaling 1079, followed by the American Association of Plastic Surgeons and the Academic Council of American Plastic Surgeons with 182 and 72, respectively. The ASPS conference also demonstrated the greatest increase in the volume of student presentations over time when compared with the others, with an approximately 17-fold increase in presentations during 10 years (365 in 2022 versus 22 in 2013).

Table 1. Volume of Medical Student Presentations by Conference and Year

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
ACAPS	0	1	0	3	0	5	1	14	23	25	72
AAPS	14	7	5	10	14	18	23	16	0	75	182
ASPS	22	21	26	41	68	86	45	157	248	365	1079
Total	36	29	31	54	82	109	69	187	271	465	1333

AAPS, American Association of Plastic Surgeons; ACAPS, Academic Council of American Plastic Surgeons.

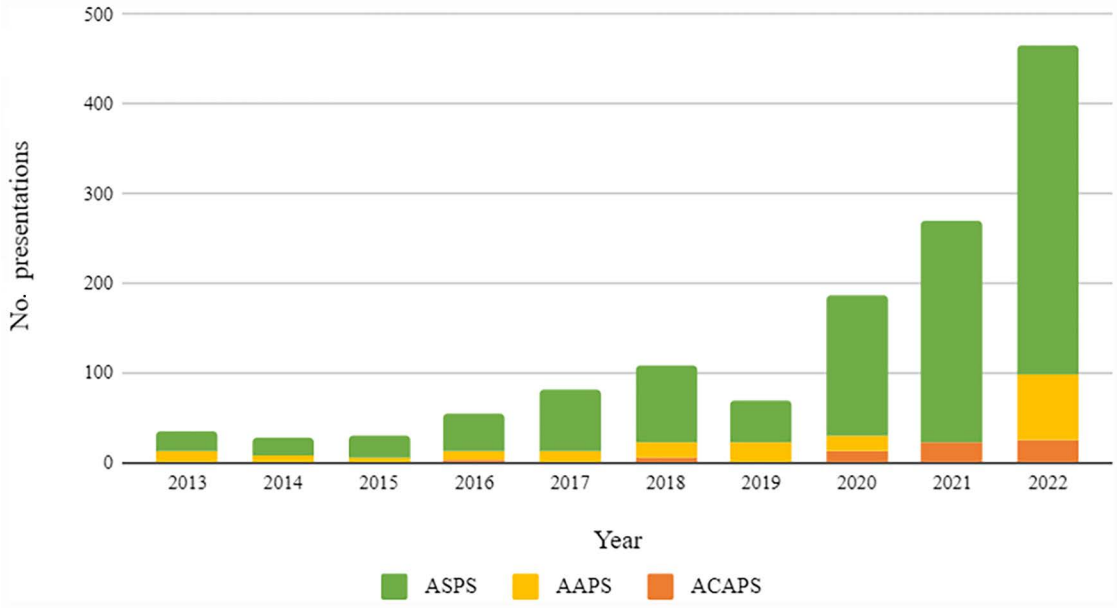

Fig. 1. A graph shows the increase in the number of PS conference presentations delivered by medical students over the course of 10 years. An approximately 13-fold increase was noted, from just 36 presentations in 2013 to 465 presentations in 2022. The ASPS annual meeting hosted the greatest number of presentations delivered by students, compared with the ACAPS and AAPS annual meetings. AAPS, American Association of Plastic Surgeons; ACAPS, Academic Council of American Plastic Surgeons.

In 2013–2020, the sum of presentations across all 3 conferences was 597. The sum of presentations in the following 2 years exceeded that of the previous 8 years, with 736 presentations in 2021–2022 ($P < 0.001$).

Frequency of Presentations per Student

Approximately 62% of individuals delivered just 1 presentation at the national level, whereas 38% delivered multiple presentations (Table 2). A moderately positive correlation was found between the frequency of national presentations per individual and their PRS match rates ($r = 0.567$; $P < 0.156$), excluding those who presented more than 6 times due to the small sample size. Those who delivered 1 presentation had a PRS match rate of 50%, whereas their counterparts who delivered multiple presentations had a significantly higher match rate of 76% ($P < 0.0001$) (Fig. 2). When comparing the 2013–2020 and 2021–2022 cohorts, the match rates corresponding to the frequency of presentations showed minimal differences across the overall time period.

Demographics of Medical Student Presenters

A total of 745 students presented their research at national PRS conferences from 2013 to 2022. This included 369 students in 2013–2020 (49.5%) and 376 students in 2021–2022 (50.5%). In the earlier cohort, 84% of students were HP and 16% of students were NHP. In contrast, the later cohort showed a significantly greater proportion of NHP students, which grew to 25% in 2021–2022 ($P = 0.004$). Over the total length of time studied, 80% of all included students were HP and 20% were NHP.

The overall match rate was 62% for HP students and 58% for NHP students ($P = 0.406$). A subanalysis of the 2013–2020 and 2021–2022 cohorts showed similar outcomes for both groups, demonstrating little change in their respective rates across the overall period.

Affiliated Research Institutions of NHP Presenters

Over the 10-year study period, 60% of NHP presenters were found to have performed research externally at other institutions with HPs. This number increased from 53% in the earlier cohort to 64% in the more recent 2021–2022 cohort, though the difference was not statistically significant ($P = 0.157$) (Table 3). Students who chose to perform research within their own NHP institutions experienced a match rate of 44%. In contrast, NHP students researching at external HP institutions had a

Table 2. Frequency of Presentations per Student and Corresponding Match Rates

Frequency of Presentations	1	2	3	4	5	6	7	8	9	10	11	>1
No. students	453	150	57	32	18	14	4	1	1	3	1	281
Percentage of cohort, %	61.7	20.4	7.8	4.4	2.5	1.9	0.5	0.1	0.1	0.4	0.1	38.3
Average match rate, %	50	70	85	90	67	82	50	100	100	67	100	76
P	—	<0.0001	<0.0001	<0.0001	0.21	0.039	*	*	*	*	*	<0.0001

*Sample sizes are too small to calculate the *P* value.

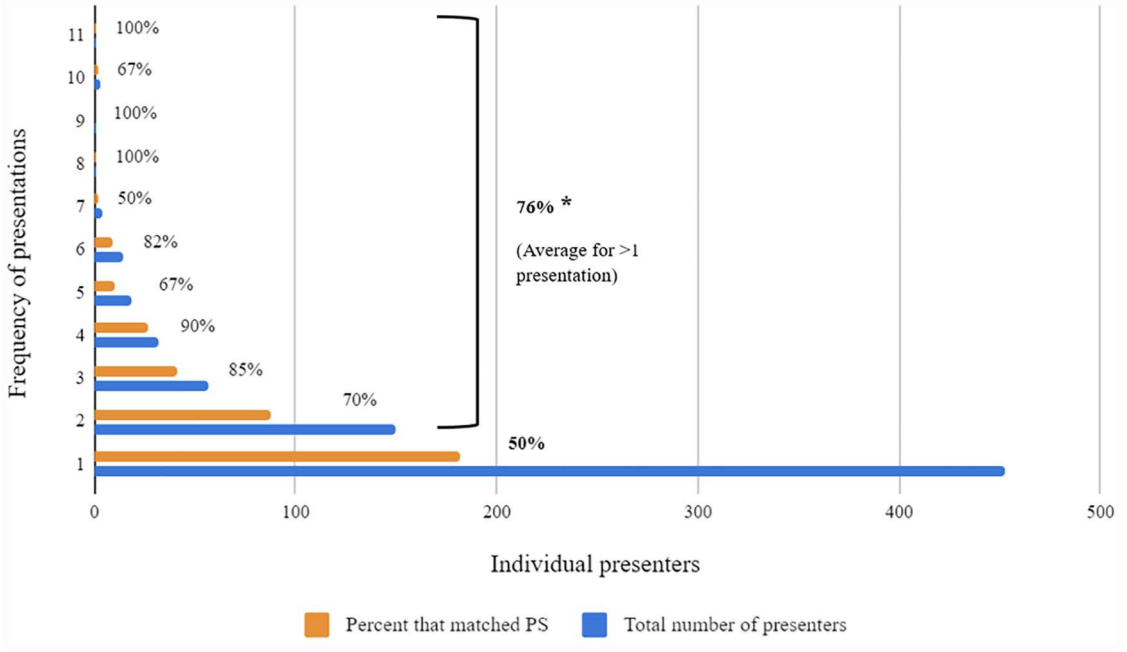

Fig. 2. The study cohort was stratified by the number of presentations delivered by each individual, and then the PS match rate within each cohort was calculated. Approximately 62% of students delivered just 1 presentation at a national PS conference, corresponding to a 50% match rate. For the 38% of students who delivered more than 1 presentation, an average PS match rate of 76% (*) was observed. Match rates generally increased with an increased frequency of presentations per person.

Table 3. Cohort Demographics and Match Rates, 2013–2020 Versus 2021–2021

	Year			
	2013–2020	2021–2022	*P*	Overall
No. students	369	276	0.0007	745
NHP (percentage of cohort), %	16	25	0.004	20
PRS match rate, %	63	58	0.204	61
HP	63	61	0.569	62
NHP	59	57	0.790	58
NHP students researching at external HP institutions (percentage of cohort), %	53	64	0.157	60
PRS match rate, %	74	66	0.450	70
PRS match rate of NHP students researching within NHP institution, %	43	45	0.854	44

significantly higher match rate of 70% ($P = 0.005$). This finding was consistent across both the 2013–2020 cohort and the 2021–2022 cohort.

DISCUSSION

The rapid rise in medical students' research contributions at academic conferences has tremendously shifted the paradigm with regard to expectations for competitive residency applicants. A recent study details that, across 3 national PRS conferences in the last 2 years, 35% of presenters were medical students.[20] Findings from our study additionally demonstrate that the number of presentations delivered by students in just the last 2 years well exceeded the amount combined from the previous 8 years, indicating that the "race to research" is carrying more momentum now than ever.[24–26] We hypothesize that students' increased research productivity was initially incited by greater availability among academic plastic surgeons during the pandemic but has

since become the new standard for PRS applicants in subsequent years.[27]

Another key finding of our work shows that students who present at national conferences multiple times have a significantly higher PRS match rate than students who presented just once, and that with each additional presentation, PRS match rates generally increased, as well. This suggests that increased research participation is correlated with improved match outcomes and dually provides context toward the key question—how much research is enough? Barring small sample sizes for cohorts that presented 7 or more times, the bulk of our data reliably advises that presenting twice at national PRS conferences is correlated to a 70% match rate and 3 times with an 85% match rate.

Though a strong background in research holds great weight in resident selection,[1,2,23,28] some have criticized that prioritizing quantity of research over quality can hurt clinical care, leaving less room for higher impact studies.[29] Some claim that abstracts accepted for conferences often undergo minimal scrutiny and peer review compared with manuscripts,[30] and yet another group found that only two-thirds of abstracts presented at PRS conferences are eventually published as full articles.[31] Furthermore, from a practical standpoint, there is a publication lag whereby submitted research may not be visible to others due to long lead times in peer review and publication processes.[11] Though some feel that frequent publication is a sign of hasty research, others have suggested that prioritizing the quality of research may not necessarily increase its impact, and another team found that authors were cited more frequently in the years they produced more research.[32,33] Ultimately, there is great debate surrounding the utility of using research output as a tool to evaluate residency candidates.

Young learners entering the research arena, many of whom are more incentivized by the opportunity to bolster their match prospects than by personal academic interests,[34] should take caution to create meaningful work that positively contributes to medicine, despite the pressure to publish in large quantities. Commonly available match data often lump different research items together, causing an inflated misperception of matriculants' research productivity,[2,35] given that items such as poster presentations are less complete and cogent than peer-reviewed manuscripts and that the same abstracts are often presented repeatedly at multiple conferences. More granularity in reporting match data can guide students toward more realistic research expectations, encouraging them to prioritize engagements that will more reliably aid their development as future clinician-scientists.[36] Interestingly, several PRS conferences have implemented a cap on abstract submissions, and the newly established Plastic Surgery Central Application also deemphasizes potentially superfluous research items.[37,38]

NHP students, who remain underrepresented in the existing PRS resident pool at a rate of 24.4% in 2022,[21,22] were unsurprisingly also underrepresented at national PRS conferences in comparison to HP students. However, NHP presenters in 2021–2022 represented 25% of the overall sample—a significant increase from 16% in 2013–2020 ($P = 0.004$). Greater interest and, subsequently, more buy-in from NHP students at PRS conferences validate the need to level the playing field in the resident selection process. Considering that the NHP match rate has not changed over the last 10 years, it seems that existing equity efforts, such as scholarships, mentorship opportunities, and preparation courses,[39] have yet to scale a tangible change for this population. This should also challenge residency programs, another key party involved in the equity dilemma, to more closely evaluate candidates per their individual merit and accomplishments, rewarding those who may not carry the benefit of faculty support, financial resources, or pedigree.[23,40]

In recent years, many have undertaken dedicated predoctoral research fellowships, with an increase from 1 in 5 PRS applicants in 2022 to approximately 1 in 3 in 2023.[35] For many, a key motivation in pursuing a research year, commonly at HP institutions, is to avail coveted professional relationships and mentorship opportunities that are not otherwise available at their home institutions.[22] Gaining sponsorship from influential figures and leveraging their affiliations confers a valuable advantage when spending a research year at an HP institution.[23] Research fellowships may provide some level of insurance in the PRS match, appealing to residency programs seeking candidates who are likely to publish frequently throughout their training.[41,42] However, it is widely debated whether a research year is necessary for an applicant to meet the average qualifications of PRS matriculants, and some studies even posit that the quantity of research items does not predict a successful match, or one's future research productivity.[11,24,27] Additionally, some question whether research fellowships can also foment inequalities based on socioeconomic disparities.[43]

Finally, our results also demonstrated that NHP students who availed opportunities to research externally with HP institutions were 59% more successful in matching than NHP students who did not. In fact, the 70% overall match rate of this cohort outperformed the 62% match rate of HP students. When granted access to the same resources, it was determined that NHP students are equally as successful, or perhaps even more successful, than HP students in the match. This finding is supported by previous work from our group, disproving the common misconception that NHP students are generally less competitive applicants.[22] Collectively, our findings recommend that seeking resources externally at HP institutions is the most reliable course of action for NHP students to overcome their inherent disadvantages in pursuing PRS.

Unfortunately, the onus typically falls upon students to establish such relationships, whether through cold-emailing, applying for research fellowships, or finding opportunities to connect in person. Attending conferences, or better—presenting at conferences—poises medical students to impress potential mentors and cultivate relationships that can yield resources otherwise unavailable to them. A key consideration for students participating in research is that oral and poster presentations, though lesser in scientific value than manuscripts,

can arguably earn greater returns, whereas proceeding directly to manuscript submission precludes one from valuable networking opportunities at academic conferences. For NHP students who may not otherwise engage regularly with PRS faculty, it is of utmost importance to prioritize conference presentations early in one's medical school career to foster stronger connections with greater longevity and increased familiarity among HP institutions.

Limitations

Though our results demonstrate convincing correlations for a successful match, causation cannot be proven without additional context pertaining to standardized examination scores, letters of recommendation, and other residency application information including certain coveted personality traits present in applicants who pursue research and its presentation at conferences, confounding our results. Furthermore, we acknowledge that research, both in its quantity and quality, may hold different weight across residency programs in their evaluation of candidates.

Students included in our research were those listed as first authors of their respective works. We did not account for additional presentations in which their names appeared at a later position on the author block. Presenters were labeled as "unmatched" if they did not matriculate into PRS as graduating senior medical students, though we did not investigate if these individuals did a research year during medical school. Furthermore, with limited ability to confirm whether individuals ultimately chose to apply to PRS residencies, the "unmatched" label was used indiscriminately with the assumption that all students in our sample did apply to PRS programs. Applicants who entered PRS residency through an alternate pathway, such as success on reapplication or transferring from general surgery training, were not included in the "matched" category. Minor inaccuracies in meeting programs and data collection were also possible limitations. Although all allopathic students presenting research were included in the final analysis, osteopathic and international medical student applicant review was less uniform, and therefore, these individuals were excluded.

The COVID-19 pandemic in 2020–2021 uniquely affected participation in some conferences, which explains the reported value of 0 presentations for 1 meeting. Similarly, ASPS held its meetings virtually during the pandemic, which still allowed students to present research, but likely limited networking opportunities. Finally, our study excluded students who have presented at local, state, or regional PRS conferences, and their experiences may differ from those represented in our work. Similarly, we did not account for students who attended conferences but did not simultaneously present research.

Future studies should be directed toward unpacking the comprehensive networking experience in competitive specialties such as PRS. There is a lack of research assessing the opinions and attitudes of conference attendees in academic medical settings. Evidence-based recommendations to optimize networking opportunities would offer great utility for medical students and trainees in PRS and adjacent fields.

CONCLUSIONS

Our findings conclude that medical students who present more frequently at national PRS conferences have greater success in the PRS match, with a 76% average match rate for those who delivered more than 1 presentation. NHP students, though underrepresented among PRS matriculants and among conference presenters, had a match rate of 70% when they researched externally at an HP institution; this was significantly greater than the 44% PRS match rate for NHP students researching within their NHP institutions, and it even surpassed the match rate of HP students. A 13-fold increase in medical student presentations has been observed at national PRS conferences over the last 10 years, with a notable spike in the last 2 years, demonstrating that research continues to be an increasingly substantial criterion for competitive applicants.

Although publications are imperative, students must not overlook the value of conferences as an avenue to take advantage of the opportunity to interact face to face with key stakeholders in academic PRS. Prioritizing conference presentations, and subsequently building relationships with faculty, residents, and others at HP institutions, can impart significant advantages, particularly to NHP students. Given the current state of disparities in PRS resources, the match success of future NHP applicants, as well as other similarly disadvantaged applicants, relies heavily on continued access to resources, mentorship, and allyship externally at HP institutions.

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