



Generation Y and the Integrated Plastic Surgery Residency Match: A Cross-sectional Study of the 2011 Match Outcomes

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Background: Plastic surgery is the most competitive specialty in medicine. We sought to identify factors associated with the successful match of generation Y applicants into integrated plastic surgery residency.

Methods: We utilized the most recent data from the *Charting Outcomes in the Match* published by the National Resident Matching Program in 2011. We had data on US senior or independent applicant status, Alpha Omega Alpha (AOA) status, attendance of top 40 medical schools, advanced degree status, and number of contiguous ranks within plastic surgery. Our main outcome measure was match status.

Results: A total of 81 out of 197 applicants (41.1%) successfully matched into integrated plastic surgery in the 2011 main match. US seniors matched at a significantly higher rate compared to independent applicants (44.0% vs 24.1%, $P = 0.044$). Matched US seniors were more likely to have AOA membership compared to unmatched US seniors (45.9% vs 27.7%, $P = 0.014$) and attend a top 40 medical school (52.7% vs 35.1%, $P = 0.022$). There were no differences in terms of advanced degrees between matched and unmatched US seniors. Unmatched US seniors were more likely to have 3 or fewer contiguous ranks of plastic surgery residency programs than matched US seniors (86.2% vs 68.9%, $P = 0.007$).

Conclusions: US senior status, AOA membership, and attendance at a top 40 medical school are predictors of matching into integrated plastic surgery. Program directors need to be aware of the background of the millennial applicants to recruit and maintain top residents. (*Plast Reconstr Surg Glob Open* 2013;1:e33; doi: 10.1097/GOX.0b013e3182a47ed3; Published online 20 August 2013.)

Plastic surgery ranks among the most competitive specialties in medicine. Traditionally, plastic surgery training took place following completion of general surgery, otolaryngology, neurosurgery, orthopedic, or oral maxillofacial surgery

in what is termed the independent track. Since the integrated track for plastic surgery residency training was formally sanctioned approximately 20 years ago,¹ it has become a popular choice for students seeking plastic surgery training. The advantages of the integrated track include entering the specialty directly out of medical school and integrating general surgery training into the plastic surgery curriculum.

The total number of integrated plastic surgery positions available has increased over the past decade.² However, the number of integrated plastic surgery applicants has increased accordingly over the same time, maintaining a net match rate of approximately 50%

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over this period of time. Interestingly, the proportion of applicants ranking only integrated plastic surgery programs has increased linearly from 12.7% in 2002 to 38.0% in 2010.² Though the applicants ranking only plastic surgery had increased odds of matching compared to applicants who ranked other specialties as well, those ranking only plastic surgery programs run the risk of failing to match altogether given the competitive nature of the application process.

The present-day plastic surgery training paradigm has changed significantly compared to a prior generation. Likewise, applicants seeking to enter plastic surgery training today may have different goals and expectations compared to those from prior generations. Generation Y is the most educated generation in history, and although members tend to set high expectations of themselves, unlike generation X-ers, generation Y-ers tend to be more optimistic and are more likely to believe that they can change the world.³ Plastic surgery training remains highly competitive and continues to attract academically accomplished applicants. We sought to characterize the predictors of successful matching into integrated plastic surgery programs in the context of the recently increasing proportion of applicants hailing from the millennial generation.

METHODS

We reviewed the fourth edition of the *Charting Outcomes in the Match*,⁴ published by the National Resident Matching Program (NRMP) regarding the 2011 main residency match, for the most recently published data on characteristics of applicants matching into their preferred specialty. We collected data regarding applicants for integrated plastic surgery residency training and reviewed the number of applicants and positions offered, applicant Alpha Omega Alpha (AOA) status, whether the applicant applied as a senior from a top 40 medical school ranked by the National Institutes of Health funding, advanced degrees, and number of contiguous ranks within the specialty.

Our main outcome measure was applicant match rate, defined as the number of applicants who successfully matched into an integrated plastic surgery residency by the number of applicants submitting a rank list containing one or more integrated plastic surgery residency programs. On the basis of the classification system utilized by the NRMP, applicants were designated as either US seniors, senior medical students at allopathic medical schools in the United States, or independents, which include former graduates of US allopathic medical schools and seniors and graduates of US osteopathic medical schools or international medical schools.

We performed bivariate analyses using the chi-square test to compare the applicant characteristics by match status. Statistical analyses were performed using IBM SPSS Statistics Version 19.0.0 (IBM, Armonk, NY). This study was approved by the Human Subjects Committee at the Yale University School of Medicine.

RESULTS

For the 2011 match, a total of 81 out of 197 applicants (41.1%) successfully matched into an integrated plastic surgery residency. Of these matched applicants, 74 (91.4%) were US seniors while 7 (8.6%) were independent applicants. US seniors matched at a significantly higher rate compared to independent applicants (44.0% vs 24.1%, $P = 0.044$) (Fig. 1).

On bivariate analysis, matched US seniors were more likely to have AOA membership compared to unmatched US seniors (45.9% vs 27.7%, $P = 0.014$) (Fig. 2). Additionally, matched US seniors were also

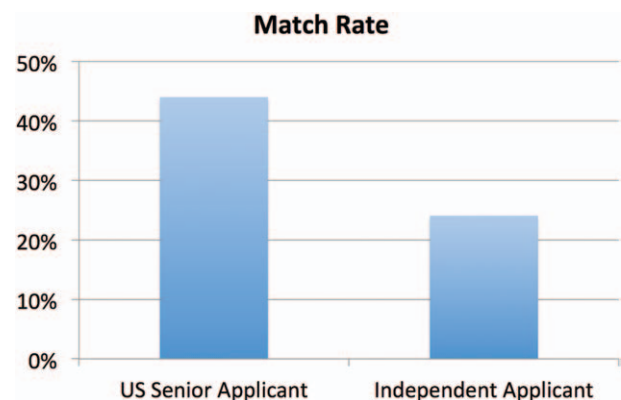


Fig. 1. US seniors were significantly more likely to match into integrated plastic surgery residency compared to independent applicants ($P = 0.044$).

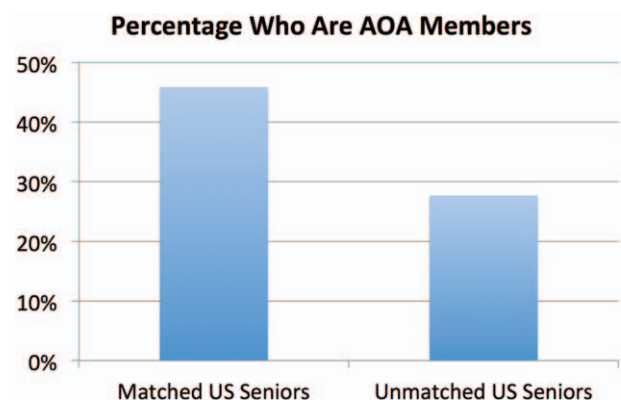


Fig. 2. US seniors who matched were significantly more likely to be AOA members compared to US seniors who did not match ($P = 0.014$).

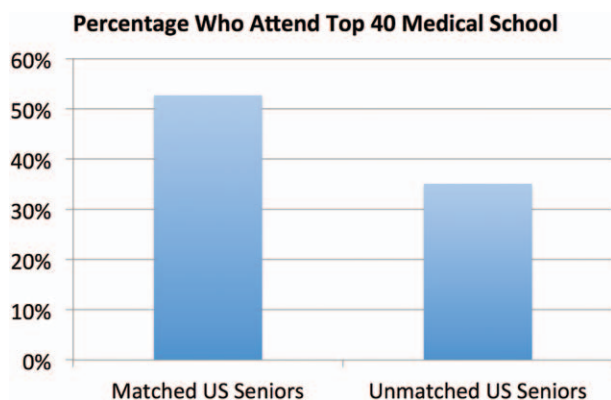


Fig. 3. US seniors who matched were significantly more likely to have attended a top 40 medical school compared to US seniors who did not match ($P = 0.022$).

more likely to attend a top 40 medical school compared to those who did not match (52.7% vs 35.1%, $P = 0.022$) (Fig. 3). There were no differences between matched US seniors and unmatched US seniors in terms of proportion with PhD degrees (6.8% vs 3.2%, $P = 0.283$) or another graduate degree (5.4% vs 7.4%, $P = 0.593$).

Unmatched US seniors were more likely to have only 3 or fewer contiguous ranks of integrated plastic surgery residency programs on their rank lists than matched US seniors (86.2% vs 68.9%, $P = 0.007$). Twenty-three of the 74 matched US senior applicants (31.1%) had 4 or more contiguous ranks, compared to 13 or 94 of unmatched US senior applicants (13.8%), yielding a 63.8% match rate for US senior applicants ranking 4 or more integrated plastic surgery residency programs contiguously.

DISCUSSION

This study presents analyses that evaluate the predictors of a successful match into integrated plastic surgery residency. Plastic surgery remains a very competitive field and is consistently the specialty with the lowest match rate. Among the data available in the most recent publication of the *Charting Outcomes in the Match* from the NRMP, US senior status, AOA membership, and attendance at a top 40 medical school were significant predictors of matching into an integrated plastic surgery residency. Having graduate degrees did not seem to influence match rates. Intuitively, match rates increased with an increasing number of contiguous rankings of plastic surgery programs.

The predictive value of AOA membership as opposed to having obtained a graduate degree such as a PhD suggests that program directors value student success within the confines of the undergraduate

medical education, demonstrated predominantly by receiving high marks on preclinical grades, clinical grades, and board scores. At 45.9%, AOA membership is proportionally overrepresented in the cohort of US seniors that match into integrated plastic surgery programs, given that only up to one-sixth of a given graduating class may be elected into AOA among medical schools with AOA chapters.⁵ Reflecting the importance of scholastic achievement for matching, the mean United States Medical Licensing Examination (USMLE) step 1 score is 249 for matched US seniors compared to 238 for unmatched US seniors.⁴

Both AOA membership and USMLE step 1 score were also correlated with the number of interview invitations from integrated plastic surgery residency programs, as reported by Rogers et al⁶ from survey responses from applicants applying for integrated plastic surgery residency. In addition, they observed that high class rank, presence of a plastic surgery residency program at the applicant's school, and authorship on one or more publication were predictors of receiving a greater number of interview invitations. As an interview is often a prerequisite for matching, it is not surprising that the predictors of receiving interview invitations are similar to those for matching.

Residents in integrated plastic surgery also tend to score higher on pre-residency quantitative educational metrics including USMLE step 1 score, attend a more highly ranked medical school, and have a stronger publication record compared to residents in the independent track.⁷ Interestingly, the quantitative educational metrics measured during plastic surgery training, such as scores on in-service examinations, were remarkably similar between integrated and independent plastic surgery residents. The relatively new integrated track has now been adopted by approximately half of all plastic surgery residency programs and accounts for half of all positions offered. The merits of each track continue to be debated.

In addition to the objective measures of applicant success, subjective criteria are important for matching as well.⁸ These include obtaining high-quality letters of recommendation, which can be a major differentiating factor among applicants.⁹ A significant proportion of plastic surgery residents matched at either the program at their own medical school or at a residency program where they completed an away subinternship. This suggests that plastic surgery applicants should complete rotations at programs they are most interested in. Other important subjective criteria include leadership capabilities, maturity, and interest in academic career.¹⁰

To a strong extent, medical students applying for integrated plastic surgery residency are self-selecting based on a record of academic achievement.² However, the decision to apply for plastic surgery residency is presumably multifactorial. Greene and May¹¹ surveyed medical students applying for integrated plastic surgery residency and found that students from schools with plastic surgery residency programs were more likely to apply for plastic surgery residency. Other factors that applicants valued included compatibility with the personality of plastic surgeons as a significant influence in career choice, while lifestyle and income potential were rated as moderately important factors.¹¹ Among medical students applying into integrated plastic surgery programs, the decision to pursue a plastic surgery career was typically made during the third year of medical school.

Following the decision to apply to plastic surgery residency, applicants need to consider which programs to apply to. Several factors may influence how current applicants decide which programs to consider. Generation Y-ers tend to value the quality of resources a program can contribute to an individual's education, a medium to voice their opinions, and a role in major decisions.³ Compared to prior generations, residents of the millennial generation also tend to favor hands-on experience over rote memorization, creativity over rigid systems, and collaboration with a team.¹² Millennial residents grew up in the age of instantly available information and thrive off immediate feedback on their performance. While not averse to hard work, residents of the millennial generation value an appropriate work-life balance.

Given the ever-evolving training landscape of plastic surgery training, there are several factors that residency program directors may want to keep in mind to recruit the strongest applicants to their residency programs. Members of generation Y are technologically savvy and readily embrace new technologies. Residency program web sites should be modernized to optimize appeal to the millennial generation. Programs should also strive to incorporate modern technologies, such as simulations, into resident education. Millennials also value close relationships with authority figures and want to feel that their supervisors care about them personally. They also value being able to share their opinions despite having lower status in the organizational hierarchy. Thus, ability of a residency program to provide resident mentorship is a valuable asset to the program. The benefits of resident mentorship include having a safe environment in which to receive feedback, which can then further enhance resident performance in the clinical setting.

CONCLUSIONS

In conclusion, the decision to apply for integrated plastic surgery residency is complex and factors associated with a successful match include applying as a US senior medical student, AOA membership, applying from a top 40 medical school. An advantage of our study methodology is that we were able to capture national data from all of the applicants who applied to one or more integrated plastic surgery programs in the United States in 2011. However, a limited number of applicant characteristics were analyzable. Regardless, this study provides prospective applicants and current program directors with additional insight regarding the integrated plastic surgery match process. This is an exciting time for the field of plastic surgery, as the millennial generation increasingly contributes its unique talents and attributes to the plastic surgery workforce.

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