The value of residency program characteristics changes throughout urology training

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Introduction: *The purpose of this study was to determine which characteristics of urology residency programs are most highly valued by medical students and residents, and how these change during training.*

Materials and methods: *We distributed a survey to urology residents and medical students interested in urology via program director email and social media. The survey collected demographic data, future career plans, and asked respondents to rank the relative importance of six categories of residency program characteristics and specific characteristics within each category.*

Results: *Among the six categories of residency characteristics, resident experience was ranked most important by both medical students and residents, followed by geography and clinical experience which were tied. Medical students ranked clinic experience and formal mentorship with greater importance while residents placed higher value on the active role of clinical faculty and help from advanced practice providers. Trainees planning for an academic career ranked research experiences and resident diversity as more important than those entering private practice.*

Conclusions: *Residents and medical students mostly agreed on the relative importance of residency program characteristics. The differences observed suggest that as trainees gain experience they place greater importance on informal relationships with faculty and value characteristics that enhance surgical training such as support from advanced practice providers and less time in clinic. These findings may guide programs on what information to include on their websites and presentations.*

Key Words: urology residency application, residency match, graduate medical education, surgical training

Introduction

One of the most significant recent changes in urology residency training has been the transition to virtual interviews and recruitment prompted by the COVID-19 pandemic. A large body of research has focused on the effects of this shift, including applicant and faculty satisfaction with the match process.[1-4] With less time spent in person with residents and faculty, applicants' ability to assess residency programs is more limited. Virtual events such as open houses and social media have made this easier, but evaluating the actual residency experience at a given program may be challenging.[5-8]

In order to select and rank residency programs that are most in line with their interests, applicants must consider a wealth of information about each program. Unfortunately, the information available on residency program websites is highly variable, making program evaluation prior to the interview day challenging.[9] Once applicants are making their rank

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lists, they report placing particular emphasis on their interactions with residents, interactions with faculty, and surgical training.[2,4,6,10] While these considerations may serve as a guide, differentiation of programs based these broad factors can be challenging. Additionally, it should be expected that preferences and values will change as applicants enter residency. Characteristics that seemed important as medical students may be less crucial as residents.

In order to address this need, we conducted a survey of both urology residents and medical students interested in pursuing urology. We asked survey respondents to rank the relative importance of a variety of residency characteristics to find qualities that residents and medical students value most, with the goal of helping applicants seek out the most essential information and make better informed decisions.

Materials and methods

Our anonymous survey was distributed via social media (Twitter and the Urology Match Google Spreadsheet) and direct email to residency program directors, who were asked to share the survey with their residents and medical students interested in urology. The survey collected demographic information, future career plans, current position (medical student vs. resident), and rankings of the relative importance of various residency program characteristics categorized into groups. The categories included resident experience (culture, program structure), research experience (dedicated time, funding, support), academic culture (faculty training, mentorship, diversity), clinical experience (surgery, clinic, support staff), hospital/institution (ranking, facilities, patients), and geography (travel, costs, entertainment). For each category respondents were asked to rank the characteristics from most important to least important, with a ranking of 1 signifying the most important characteristic. Study data were collected and managed using REDCap electronic data capture tools hosted at Cedars-Sinai. Data analysis was performed using SPSS v26 (IBM Corp., Armonk, NY, USA). None of the variables analyzed were normally distributed, therefore Mann-Whitney U test was used to compare ranking distributions between groups. Statistical significance for type I error set at $p = 0.05$.

Results

There were 74 respondents to our survey. Due to the method of distribution, the number of survey recipients is unknown. Among these respondents 50% were current urology residents and 50% were current medical students either pursuing or interested in urology residency. Their baseline characteristics were relatively similar, Table 1. The majority of medical students were in their 3rd year (57%) and 65% of residents were junior residents (PGY1-3).

Characteristic categories

Survey respondents were asked to rank the relative importance of six categories of residency program characteristics. There was no statistical difference between medical students and residents in their rankings of these categories, Table 2. Resident experience ranked as the most important category of characteristics for both groups, with 69% medical students and 77% of residents ranking it most important. Research experience was the least important category for both groups, as 46% of medical students and 64% of residents ranked it last.

Resident experience

Residents and medical students both ranked "resident culture, camaraderie, happiness, closeness" as the most important characteristic of the resident experience; however, residents were more likely to rank this first than medical students ($p = 0.006$). Interestingly, medical students ranked "In-service scores" higher in importance than residents, with a median rank of 7 and 8 respectively ($p = 0.047$).

Research experience

There were no significant differences in the rankings of residency research experience characteristics between medical students and residents. The median rank for dedicated research time was 2.5 for medical students and 4 for residents.

Academic culture

Among characteristics of academic culture, residents rated the "active role of clinical faculty" as more important than medical students did ($p = 0.008$), Figure 1. On the other hand, medical students ranked "formal mentorship" as more important than residents did, ($p = 0.002$). "Encouragement to enter academics vs. private practice" was the characteristic in this category most frequently ranked as least important by residents (50%), whereas medical students most frequently ranked "faculty diversity" as least important (29%).

Clinical experience

Both medical students and residents ranked operative autonomy as the most important characteristic of the

TABLE 1. **Demographic data of survey respondents**

		Medical students	Residents
N		37	37
Median age (range)		26 (21-34)	30 (26-37)
Training year	MS1 or PGY1	1	14
	MS2 or PGY2	7	6
	MS3 or PGY3	21	4
	MS4 or PGY4	8	5
	PGY5	n/a	7
	PGY6	n/a	1
Gender	Female	12	15
	Male	25	21
	Non-binary	0	1
Race/ethnicity	Asian	5	8
	American Indian or Alaska Native	0	0
	Black or African American	3	0
	Hispanic/Latino	8	4
	Native Hawaiian or Other Pacific Islander	0	0
	White	21	24
	Other	3	1
	Prefer not to say	0	2
Relationship status	Married or domestic partnership	17	24
	Single / never married	20	13
	Have children	4	6
Future career plans	Academics	11	15
	Private practice	7	12
	Unsure	19	10

n/a = not applicable

residency clinical experience and overall case volume as the second most important. Medical students ranked "clinic experience" and "resident run clinic" with greater importance than did residents (p = 0.01, p = 0.007). Residents rated the presence of "APPs (Advanced Practice Providers) and support staff" higher than medical students did (p = 0.002).

Hospital/institution

The most important residency program hospital/institution characteristics were not widely agreed upon with no median of characteristic ranking between 1-3. The characteristic most frequently rated as most important by medical students and residents was "ranking / quality of overall institution" by 23% and 24% respectively. The only significantly different ranking between the two groups was for "type of institution (private vs. public)", which residents believed was more important than medical students (p = 0.008).

Geography

In terms of geographic characteristics of residency programs, medical students most frequently rated "distance from family" as the most important factor (42%), while residents rated "distance from family" and "urban vs. rural" as most important (31% and 31%). Residents rated "travel between institutional sites" with greater importance than medical students (p = 0.01).

TABLE 2. **Median residency characteristics rankings by trainees**

	MS	Res		MS	Res
Categories					
Resident experience	1	1	Research experience	5	6
Academic culture	4	4	Hospital/institution	4	4
Clinical experience	3	3	Geography	3	3
Resident experience			**Research experience**		
Resident culture, camaraderie, happiness, closeness	1	1	Dedicated research time	2.5	4
Diversity of residents: gender, ethnic, racial, LGBTQ	5	5	Research facilities	4	4
Salary and benefits	5	5	Resident research productivity	3	3
Call schedule	4	3	Pressure to be productive	6	6
Program duration	5	5	Research support staff	2	3
Board pass rate	5	7	Travel support to meetings	3	3
In-service scores	7	8			
Protected time for didactics	7	5	**Hospital/institution**		
Successful fellowship placements	6	4.5	Number of sites	5	4
			Rotations at Country or VA hospitals	6	4.5
Academic culture			Dedicated endourology suite	6	6
Fellowship trained subspecialists	2	2	Department vs. division	6	7
Exposure to nationally prominent faculty	5	5	Underserved patient population	4	5
Size of faculty	5	4	Association with a medical school	4	4
Active role of clinical faculty	3.5	2	Type of institution (private vs. public)	8	5
Faculty diversity	4	4	Wellness program and resources	6	8
Encouragement to enter academics vs. private practice	6	6.5	Ranking/quality of overall institution	4	5
Formal mentorship	2	4	Ranking/quality of residency programs	6	7
Clinical experience			**Geography**		
Dedicated workspace	6	6	Urban vs. rural	2.5	2.5
Operative autonomy	1	1	Nearby entertainment, culture, or athletic resources	3	4
Overall case volume	2	2			
Open surgery case volume	4	4	Cost of living	4	4
Robotic case volume	4	4	Housing	4	4
Clinic experience	5	6	Taxes	6	7
Resident run clinic	**7**	**7.5**	**Travel between institutional sites**	**5**	**3**
Presence of fellows	7	8	Distance from family	2	3
APPs and support staff	8	6			

MS = medical students; Res = residents

Academics vs. private practice

Additional analysis was performed by creating groups based on respondents' future career plans, regardless of medical student/resident status, with 26 respondents planning to enter academics and 19 planning to enter private practice. The 29 respondents who were "unsure" were excluded from analysis. For residency characteristic categories, the future academic group ranked "research experience" with greater importance and the future private practice group rated "hospital/institution" with greater importance ($p = 0.001$, $p = 0.04$), Figure 2. Those planning on entering an academic

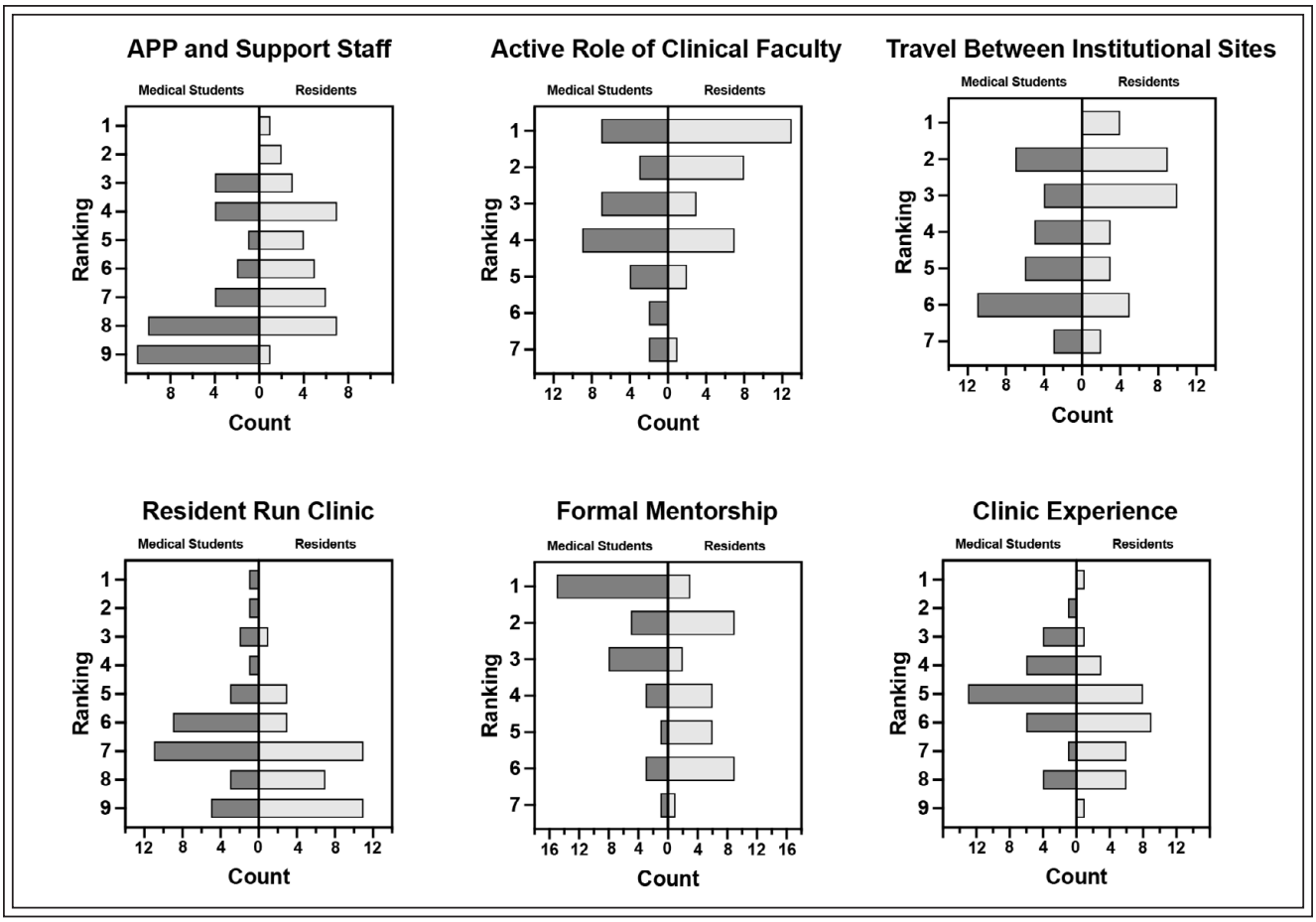

Figure 1. Ranking distributions of residency characteristics rated differently by medical students and residents.

career also rated "diversity of residents: gender, ethnic, racial, LGBTQ" and "dedicated research time" as more important characteristics (p = 0.02, p = 0.03). The group with future plans for private practice rated "resident culture, camaraderie, happiness, closeness" and "call schedule" as more important (p = 0.02, p = 0.01).

Discussion

This study sought to determine which categories and specific characteristics of residency programs are most important to urology residents and medical students. We found that medical students and residents mostly valued the same factors, with the categories of resident experience, clinical experience, and geography being the most important. The difference in relative importance of specific characteristics between the two groups highlights a change in values that likely occurs as medical students gain experience through residency. These rankings of categories and individual characteristics may serve as a guide for urology residency programs to help them highlight the unique aspects of their culture and clinical training, while providing information on the characteristics that applicants value most.

The resident experience, and more specifically the relationship between residents, denoted in our survey as resident culture, camaraderie, happiness, closeness was rated as the most important characteristic of a residency program. This is in line with previous research finding that interactions with current residents, such as interviews and social events, were the most important feature of the interview day and highly impactful on applicant' rank lists.[2,4,10] While medical students reported that virtual interviews with residents adequately replicated in-person interviews, resident socials, where applicants and residents interact in a less formal nature, were not well replicated virtually.[11] This puts greater emphasis on the importance of away rotations as opportunities to interact with residents, and in the coming years we may see more applicants matching to an institution where they completed a subinternship.

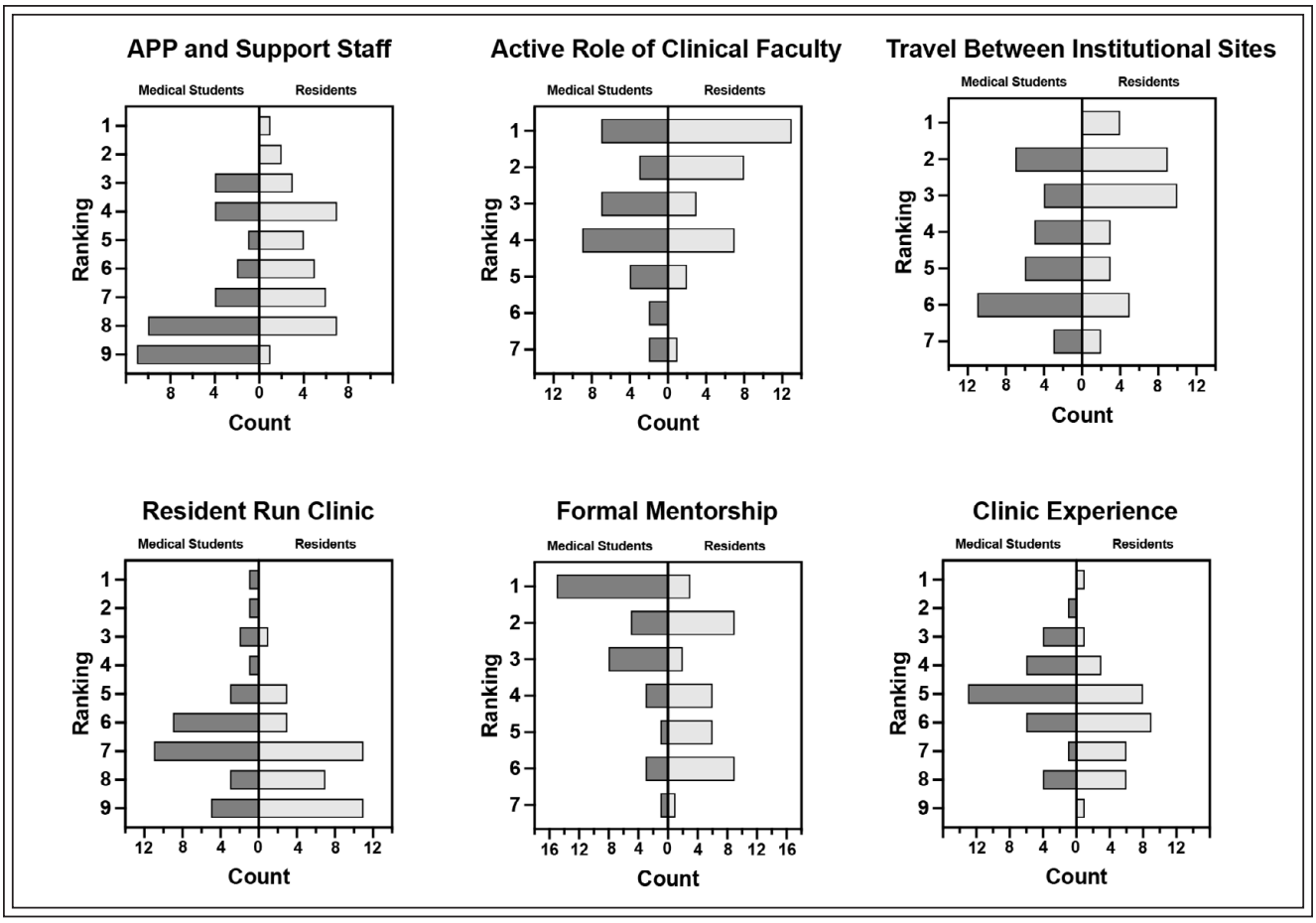

Figure 2. Ranking distributions of residency characteristics rated differently by respondents interested in academics versus private practice.

The relationship between faculty and residents has been reported among the top three most important residency characteristics. Our survey did not ask about this relationship overall, but rather specific aspects, under the category of academic culture. Resident respondents in our survey valued the active role of clinical faculty in residency highly, with a median rank of 2, compared to 3.5 for medical students. This was nearly the inverse of the groups' rankings of formal mentorship. Both medical students and residents clearly value the role of faculty in residency education; however, it is likely that the residency experience involves a more informal, working relationship with faculty than medical students appreciate.

The importance of clinical experience in evaluations of residency programs has not been well assessed, and the majority of prior research on factors that influence applicants' rank lists focused aspects of the interview day. A survey by Lebastchi et al found "operative experience" as the most important criteria for evaluating urology residency programs, while Zhao et al's qualitative analysis of applicants' online comments found that surgical volume and autonomy were important factors, among others, but were not able to evaluate the relative rankings.[6,10] This is consistent with the results of our survey as medical students and residents rated operative autonomy and overall case volume as the two most important aspects of clinical experience. There may be characteristics that medical students are overlooking, however. Notably, clinic experience and resident-run clinic were ranked as more important to medical students than residents, while travel between institutional sites and the presence of APP and support staff were ranked lower. These differences are important for medical students to consider as time spent travelling between sites may detract from other opportunities and APPs have an increasingly larger role in urologic surgery.[12-14]

In our survey, geography was tied with clinical experience as the third most important category of

residency characteristics for both medical students and residents. This is similar to previous surveys finding that city or campus visits may have a large impact on applicant rank lists.[3,4] Unfortunately, applicants also believe that these experiences cannot be well replicated virtually.[11] Many of the geography characteristics evaluated in this study, including distance to family, housing, cost of living, and others can be assessed virtually, however, it is likely these characteristics will vary in importance by person.

We also assessed the residency characteristic preferences of medical students and residents planning to enter careers in academics versus private practice. Previous research on these two groups has established a connection between research productivity and choice of an academic career, but preferences for aspects of residency training between these two groups has not been previously examined.[15-17] We found that those planning on an academic career not only cared more about research experience and resident diversity, but they also ranked resident culture and call schedule as less important than their colleagues planning to enter private practice. This is the first report that future career plans may influence the relative importance of residency program characteristics.

While the differences in rankings between medical students and residents may provide insight to applicants, the results our survey may provide the greatest utility to residency programs. As previously discussed, previous research on the factors that influence applicants' rank lists has focused aspects of the interview day, however in the preceding months, applicants must first decide which programs to apply to. A survey by Gaeta et al found that 78% of applicants were influenced to apply to a residency program based on information from their website, yet an evaluation of urology residency programs' websites in 2020 found the provided information to be highly variable between programs.[9,18] As shown here, differences between applicants, such as their future career plans, may influence the relative importance of specific residency characteristics. The lack of consistent information about these factors on program websites limits applicants' ability to make informed decisions. The results of this study provide residency programs with essential information on what features and characteristics they should be highlighting and better describing on their websites, open houses, and interview day presentations.

The strengths of this study include the novelty of the findings, examination of differences in residency characteristics preferences between groups, and validation of previous medical student and resident surveys. A weakness of this study is most notably its small sample size. This may be due to the lack of monetary reward for survey completion, which has accompanied many similar surveys. Unfortunately, small sample size may have limited our ability to differentiate between many of the characteristics. While we initially hypothesized that the relative importance of program characteristics would change as residents progressed through their training, our small sample size prohibited meaningful conclusions to be drawn from this analysis.

Future studies should seek to understand the conflicting preferences revealed by this survey, particularly on the importance to residents of travel between institutional sites, as this may be a source of resident stress that medical students who rotate at a single institution fail to appreciate. Additionally, we should seek to better understand the effect of APPs in urology residency training as their growth is well documented.[12-14] Building off of this study as a tool for medical students, future research could ask residents more explicitly what aspects of residency training they wished they better understood when evaluating residency programs.

Conclusion

This study sought to determine which characteristics of urology residency programs are most valued and how these rankings differ between residents and medical students. The resident experience overall and resident culture more specifically were the most important factors for both groups. The differences in rankings between the two groups suggest that as trainees gain experience, they develop more informal relationships with faculty, value clinic less, and value characteristics that enhance their clinical experience such minimized travel between institutional sites and increased support from APPs. Additional analysis based on future career plans found that those entering an academic career placed higher value on research while those entering private practice valued call schedule and resident culture more highly. These findings may serve as a guide to medical students as they evaluate urology residency programs and guide programs on what information to include on their websites and presentations. □

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