Evaluation of the urology residency training program in Saudi Arabia: A cross-sectional study

Mohammad Abdulkareem Alkhamees, Sulaiman A. Almutairi, Ahmed M. Aljuhayman, Hammam Alkanhal, Saad H. Alenezi1, Mana Almuhaideb2, Sultan S. Alkhateeb3,4

Departments of Urology and 1Ophthalmology, College of Medicine, Majmaah University, Al-Majmaah, 2Department of Surgery, College of Medicine, King Saud University, 3Department of Urology, King Faisal Specialist Hospital and Research Centre, 4Department of Surgery, College of Medicine, Alfaisal University, Riyadh, Saudi Arabia

Purpose: This study evaluates the satisfaction of urology residents with the Saudi Board of Urology (SBU) Training Program and identifies areas of weakness and strength to improve the educational environment, surgical competency, and overall satisfaction of urology residents with the program.

Methods: We administered an electronic self-made questionnaire that included two sections. One comprised demographic data (age, gender, weight, height, marital status, level of training, city of training, and center of training), while the other concerned SBU evaluation (satisfaction with different aspects of training, such as ways of assessment, mentors' feedback, surgical competency, research, and strengths and weaknesses of SBU).

Results: The overall satisfaction of urology residency program was 28.8% while 44.2% of residents had a neutral response. The highest level of satisfaction with clinical and surgical practice was among graduates (56.9%) and Riyadh residents (45.1%). Furthermore, good work/life balance received the lowest level of satisfaction (5.2%) among senior residents, while good clinical experience received the highest level (62.7%) among the graduates. Residents reported a high exposure in endourology and pediatric urology, while transplant, reconstructive, and neurourology had the lowest exposure. Forty-two percent of respondents undertook research during their residency training, but most respondents (54%) did not publish any research papers during their training. Sixty-two percent of graduates felt that their training program did not prepare them adequately to perform well on the board examinations.

Conclusion: Our results confirmed that satisfaction of residents with the urology program process is variable according to the city of training. Having high satisfaction level in some cities reflects the improvement of urology training program after restructuring. We identified new areas in need of improvement, namely lack of mentorship, clear and formal assessment process, and variation of training process between central and peripheral programs.

Keywords: Burnout, residency training, residents, Saudi Arabia, urology

Address for correspondence: Dr. Mohammad Abdulkareem Alkhamees, Department of Urology, College of Medicine, Majmaah University, Al-Majmaah 11952, Saudi Arabia.
E-mail: m.alkhamees@mu.edu.sa
Received: 19.07.2020, Accepted: 25.01.2021, Published: 23.06.2021

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Alkhamees MA, Almutairi SA, Aljuhayman AM, Alkanhal H, Alenezi SH, Almuhaideb M, et al. Evaluation of the urology residency training program in Saudi Arabia: A cross-sectional study. Urol Ann 2021;13:367-73.
INTRODUCTION

The Saudi Board of Urology (SBU) Training Program aims to train and produce proficient and skilled urologists who are self-sufficient. The educational environment is an essential element for learning, accomplishment, and overall satisfaction during the residency training programs. Furthermore, a trainee improving performance is directly correlated with a positive learning environment.\[^{1,2}\] Nevertheless, residency training is a complex process that is influenced by multiple factors, ranging from program structure, accessibility to learning resources, hands-on surgical training, support from peers and mentors, methods of evaluation, and even the role of chief resident, which can impact the SBU program’s outcome and the overall educational environment.\[^{3,4}\]

Supervised by the Saudi Commission for Health Specialties (SCFHS), the SBU Training Program is a 5-year program established in 1994 that involves approximately 35 centers distributed in 18 cities inside and outside the Saudi Arabia. The 1\(^{st}\) year of training includes a 9-month rotation in general surgery where residents grasp the basics of surgery, and a 3-month rotation in the intensive care unit that gives the trainee the minimum required competency to deal with critically ill surgical patients. The urology resident then goes into a 3-month rotation over all the subspecialties in urology (uro-oncology, endourology, andrology and infertility, reconstruction, minimally invasive, neurourology, female urology, and pediatric urology) along with a 3-month rotation in selective specialties (plastic surgery, pathology, emergency medicine, vascular surgery, and urogynecology).\[^{5}\]

In 2015, Binsaleh et al. conducted the first evaluation of SBU using the postgraduate hospital educational environment measure; however, the respondents’ rate was poor (53%), which warranted further evaluation of the program.\[^{6}\] Therefore, in 2015, Binsaleh et al. conducted yet another cross-sectional study evaluating urology residents’ perception toward the surgical theater educational environment, but with another poor response rate of 45.8%, the need for a well-established understanding of the educational environment was essential.\[^{7}\] In 2016, Al Otaibi\[^{8}\] showed that out of 72 hospitals in Saudi Arabia, renal transplants were being performed by urologists in six centers, while two other centers were using surgeons to perform the transplants. The urology residency training programs in Saudi Arabia adopted the CanMEDs Competency Framework in 2014.\[^{9}\] This restructuring aimed to shift the educational focus from the process to the outcomes, standardize and assure quality of training across the nation, and make residency programs “trainee-centered” rather than “trainer-centered.”\[^{10}\] Such paradigm shift was expected to improve the overall satisfaction rate among the residents.

Therefore, we aim to evaluate the satisfaction of urology residents with SBU and identify areas of weakness and strength in order to improve the educational environment, surgical competency, and overall satisfaction of urology residents.

METHODS

This cross-sectional survey study was conducted between June and August 2019. All urology residents received an online version of the survey by E-mail using the platform www.surveymonkey.com (SurveyMonkey, Portland, OR, USA). Further, SBU graduates between 2014 and 2018 were asked to participate in the survey as well. Informed consent was obtained from all participants. A total of 51 questions were included in the questionnaires, which were E-mailed to all residents registered in the urology training program; the identities of the participants whose data were collected were kept anonymous. Open questions were included in the questionnaire. The study protocol was approved (approval number 2009-0090E) by the Central Institutional Review Board of the Ministry of Health in June 2019. The electronic questionnaire included two sections. The first section concerned demographic data, including age, gender, weight, height, marital status, level of training, city of training, and center of training; the second section concerned the evaluation of SBU itself, including satisfaction with different aspects of training, ways of assessment, mentors’ feedback, surgical competency, research, strengths, and weaknesses of SBU. Satisfaction level was measured by a five-point Likert scale. Descriptive statistics were reported as median, mean, and standard deviation. Data were collected in a Spreadsheet and subsequently analyzed using SPSS (version 17 Inc, Chicago, IL, USA). $P \leq 0.05$ was considered statistically significant.

RESULTS

The questionnaire was distributed among 247 registered residents, of whom 215 (87.04%) completed the questionnaire. The mean age of participants was 30.27 years, 95.3% were males, and 42.3% were trained in Riyadh. Junior residents comprised 43.7% of respondents, 27% were senior residents, and 29.3% were graduates. Table 1 shows the demographic data of the participants.
The satisfaction level with the residency training is shown in Table 2. Overall, 28.8% of respondents were satisfied with their training program, 44.2% were neutral, and 27% were dissatisfied. The administrative domains that yielded a high satisfaction rate were program director support (41.4%) and role of chief residents (34%). On the other hand, administrative domains with low satisfaction rate were evaluation system (25.1%) and distribution of rotations (29.8%). For the program’s ability to prepare residents for clinical practices, the level of satisfaction was 42.8%, while in the case of preparing for surgical practice, the level was 29.4%. It appears that the highest overall level of satisfaction with the urology residency program was among graduates (31.4%) compared to senior and junior residents, and among respondents from Riyadh (45.1%) compared to other regions [Figure 1].

Regarding conducting research, most respondents (42.1%) undertook research during their residency training as an optional project. However, most respondents (54%) did not publish any research papers, 27.9% published one paper, 7.9% published two papers, and 10.2% published three or more papers during their residency training. Research activity during residency training among respondents is presented in Table 4.

One part of the survey was directed toward graduates regarding their preparation for the final board examination [Table 5]. Among them, 62% felt that their training program did not prepare them adequately to perform well on the board examinations. Fifty-seven percent of graduates thought that continuing clinical and on-call duties while studying have negatively affected their performance on the board examinations.

**DISCUSSION**

The SCFHS and the SBU had undergone significant restructuring recently to standardize and assure the quality of training across the nation. Moreover, the number of accepted residents for training annually and the training centers were increased to keep up with the growing number of Saudi Arabia (Makkah, Taif, and Al-Madinah) had the lowest level of exposure to most of the subspecialties when compared to participants in other regions.

Table 3 presents the volume of exposure in common urological procedures reported by all respondents. Most senior residents and graduates have performed more than 10 cases in their residency training, with exception to microscopic varicocelectomy. Respondents in the certain regions (i.e., Makkah and Al-Madinah) reported <10 cases performed for all the procedures with exception to flexible ureteroscopy.

Participants’ opinion regarding their clinical and surgical exposure was variable in different urological subspecialties [Figure 2]. Endourology, pediatric urology, and uro-oncology had the highest exposure (86.5%, 65.5%, and 53.1%, respectively), while transplant, reconstructive, and neurourology had the lowest exposure (19.5%, 27.9%, and 31.6%, respectively). Participants in the western region...
of medical schools and their graduates. Performing our study at this specific time was important to assure that the quality of residency training was not affected by the enormous growth of number of residents.

Most participants comprised young, married, childless, male, junior residents in Riyadh city [Table 1], which shows that the urology training programs remain unattractive to female medical students, an overcrowded junior year clustered in one city, and shows the impact of this training program on family and parenthood status. This is in agreement with multiple studies that have shown similar age and sex distribution, along with marital and parenthood status, both nationally and internationally, with no noticeable change in demographics 5 years later.[10,11] These demographic characteristics can be both a result and a cause of dissatisfaction among the trainees.[12-14]

Regarding the overall satisfaction about the urology training program, 28.8% were satisfied while 44.2% had a neutral response. This level of satisfaction is considered low compared to other international residency programs (e.g., Italy, 54.9%).[13] As evident in Figure 1, there is a significant discrepancy in satisfaction level between different cities and regions in Saudi Arabia. The high level of satisfaction achieved by training centers in Riyadh region reflects that the restructuring of urology training program improved the quality of training. Residents in training centers of the western region (i.e., Makkah, Taif, and Al-Madinah) reported low satisfaction with all aspects of training. This discrepancy is attributed to various factors, including difference in clinical and surgical exposure between large referral centers and those in rural areas, failure of implementing the new restructured curriculum by academic affairs in training centers, and absences of proper feedback in between residents and their trainers. This indicates the need for the following: providing more mentorship support to juniors and improving the quality of training during these early years; invest in a national health-care system that provides access to patients in peripheral centers with quality assurance rather than relying on referral of cases to centers in Riyadh; convert the training program into a joint program, where residents rotate in a scheduled rather than arbitrary manner to help standardize the quality of training programs nationally; and integrate adjuncts of training, such as high-fidelity simulation and animal laboratories, nationally. These measures have been shown to improve the quality of training and trainees’ satisfaction.[16-20]

Although the Scientific Committee for urology training program in SCFHS has issued a new curriculum that
detailed all the duties, clinical and surgical requirements, and assessment methods, most participants agreed that the assessment process was vague. This deficit might be a result of residents’ lack of enlightenment about the curriculum as it is their responsibility to be familiar with all aspects of their training. Academic affairs in governmental training centers, program directors, and trainers also share part of the responsibility to educate residents about the objectives of training and assessment methods. This reflects the importance of a clear, structured, regular assessment process in improving the quality of training and satisfaction, which have been shown in multiple studies, and have received little attention from program directors, for multiple reasons, including time constraint on expert assessors and the disruption of continuity of care. However, these concerns can be circumvented by recruiting physician assistants and technicians to help assess technical skills of trainees, and by adopting a more time-flexible assessment process such as through distance and e-learning platforms, and integrating assessment process in clinical care such as formal assessment during morning reports, handovers, grand rounds, and mortality and morbidity meetings.

Most residents and graduates felt satisfied by their clinical and surgical exposures in endourology, pediatric urology, and uro-oncology. However, most of them felt that their exposure in the rest of urological subspecialties was inadequate. This observation is attributed to the fact that urolithiasis comprises the bulk of surgical practice in most of the training centers in Saudi Arabia. More than half of senior residents have performed <10 cases of common urological procedures performed by the general urologist such as microscopic varicocelectomy, hydrocelectomy, and circumcision. Surprisingly, 30.2% of graduates reported no microscopic varicocelectomy cases performed during their residency training. When comparing residents’ exposure in Saudi Arabia to other urology residents worldwide, we noticed that hands-on training is suboptimal in the SBU. Moreover, a significant discrepancy was also noticed in the amount of surgical exposure in-between residents and graduates in different region of the country where training centers in the western region (i.e., Makkah, Taif, Table 3: Performed cases by the end of your training (till now for residents) as a primary surgeon

| Procedure          | Junior residents (PGY-1, PGY-2, PGY-3) | Senior residents (PGY-4, PGY-5) | Graduate |
|--------------------|---------------------------------------|--------------------------------|----------|
| URE                | None                                  | 44.7                          | 1.7      | 3.2      | 20.9     |
|                    | 1-5                                   | 27.7                          | 10.3     | 7.9      | 17.2     |
|                    | 6-10                                  | 6.4                           | 17.2     | 11.1     | 10.7     |
|                    | 11-20                                 | 10.6                          | 20.7     | 15.9     | 14.9     |
|                    | More than 20                          | 10.6                          | 50.0     | 61.9     | 36.3     |
| Microscopic varicocelectomy | None                                  | 57.4                          | 29.3     | 30.2     | 41.9     |
|                    | 1-5                                   | 24.5                          | 31.0     | 17.5     | 24.2     |
|                    | 6-10                                  | 6.4                           | 6.9      | 6.3      | 6.5      |
|                    | 11-20                                 | 3.2                           | 12.1     | 14.3     | 8.8      |
|                    | More than 20                          | 8.5                           | 20.7     | 31.7     | 18.6     |
| Hydrocelectomy     | None                                  | 25.5                          | 0.0      | 1.6      | 11.6     |
|                    | 1-5                                   | 55.3                          | 24.1     | 4.8      | 32.1     |
|                    | 6-10                                  | 11.7                          | 36.2     | 19.0     | 20.5     |
|                    | 11-20                                 | 6.4                           | 25.9     | 23.8     | 16.7     |
|                    | More than 20                          | 1.1                           | 13.8     | 50.8     | 19.1     |
| TURP               | None                                  | 59.6                          | 1.7      | 1.6      | 27.0     |
|                    | 1-5                                   | 26.6                          | 22.4     | 7.9      | 20.0     |
|                    | 6-10                                  | 11.7                          | 29.3     | 19.0     | 18.6     |
|                    | 11-20                                 | 2.1                           | 25.9     | 30.2     | 16.7     |
|                    | More than 20                          | 0.0                           | 20.7     | 41.3     | 17.7     |
| Orchidopex         | None                                  | 38.3                          | 10.3     | 3.2      | 20.5     |
|                    | 1-5                                   | 38.3                          | 27.6     | 22.2     | 30.7     |
|                    | 6-10                                  | 10.6                          | 20.7     | 19.0     | 15.8     |
|                    | 11-20                                 | 6.4                           | 19.0     | 22.2     | 14.4     |
|                    | More than 20                          | 6.4                           | 22.4     | 33.3     | 18.6     |

TURP: Transurethral resection of the prostate, URS: Ureterorenoscopy

Table 4: Research activity during residency training among respondents

| Question                          | n (%) |
|-----------------------------------|-------|
| Did you undertake research during your residency training? |       |
| Yes (mandatory)                   | 45 (20.9) |
| Yes (optional)                    | 90 (41.9) |
| No                                | 80 (37.2) |
| How many papers did you publish during your residency training? |       |
| None                              | 116 (54) |
| 1                                 | 60 (27.9) |
| 2                                 | 17 (7.9)  |
| ≥3                                | 22 (10.2) |
| Which of the following facilitations were available for you? |       |
| Mentor support                    | 80 (37.2) |
| Biostatistical support            | 45 (20.9) |
| Secretary support                 | 32 (14.9) |
| Research department               | 38 (17.7) |

Urology Annals | Volume 13 | Issue 4 | October-December 2021
and Al-Madinah) providing less chance of clinical and surgical exposure to residents. Although the SCFHS follows a very strict policy and procedures in approving and accrediting each training center and a full year interhospital rotation is granted to each resident during his 4th year of residency to cover the defect of his own training center, these efforts did not translate in improving residents’ satisfaction about clinical training and surgical exposure.

Research activities and number of publications of residents were suboptimal. Only 46% of respondents have published at least one research in a peer-review journal during their training. Hellenthal et al. investigated the manuscript publication by urology residents in the United States and Canada and reported that 81% of residents submitted at least one manuscript for publication and 66% of residents published at least one manuscript during their residency.[26] Lately, the SCFHS made research projects and publications a mandatory aspect of residency evaluation.

Limitations of this study are the inherent biases of the design (subjectivity, recall bias, and selection bias). The strengths of this study include the high response rate making it more representative of the targeted population (i.e., residents in training) at all levels of training. In addition, to the best of our knowledge, this is the first evaluation study post the 2014 restructuring (adoption of the CanMEDs Competency Framework). Future studies should use more robust study design and objective instruments to measure the quality of urology training programs process and outcomes in a longitudinal fashion and should focus on standardizing and assuring the quality of training.

CONCLUSION

Satisfaction of residents with the urology program process is variable according to the city of training. Having high satisfaction level in some cities reflects the improvement of urology training program after restructuring. We have identified new areas in need of improvement, namely lack of mentorship, clear and formal assessment process, and variation of training process between central and peripheral programs. These insights should influence an action plan by the program directors’ committee.

Acknowledgments

The author would like to thank Deanship of Scientific Research at Majmaah University for supporting this work under the Project Number R-2021-19.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Genn JM. AMEE Medical Education Guide No. 23 (Part 1): Curriculum, environment, climate, quality and change in medical education-a unifying perspective. Med Teach 2001;23:337-44.
2. Hoff TJ, Pohl H, Bartfield J. Creating a learning environment to produce competent residents: The roles of culture and context. Acad Med 2004;79:532-9.
3. Cassar K. Development of an instrument to measure the surgical operating theatre educational environment. Adv Med Educ Pract 2015;6:271-7.
4. AlNenezi SH, AlWafaz AM, AlOwaifeer AM, Alkhayal A, Tabbarah A. Assessment of ophthalmology residency programs in Saudi Arabia: A trance-based survey. J Med Educ Curric Dev 2019;6:1-7.
5. Available from: https://www.scfhs.org.sa/en/MESP5/TrainingPrograms/Assessment Of Ophthalmology Residency Program in Saudi Arabia: A Trance-Based Survey. J Med Educ Curric Dev 2019;6:1-7.
6. Alotaibi KE. Challenge facing the urologist in Saudi Arabia in the future urology training. Urol Ann 2016;8:5184-8.
7. Binsaleh S, Babaeer A, Alkhayal A, Madbouly K. Evaluation of the learning environment of urology residency training using the postgraduate hospital educational environment measure inventory. Adv Med Educ Pract 2015;6:271-7.
8. Binsaleh S, Babaeer A, Rabah D, Madbouly K. Evaluation of urology residents’ perception of surgical theater educational environment. J Surg Educ 2015;72:73-9.
9. AlOtaibi KE. Challenge facing the urologist in Saudi Arabia in the future urology training. Urol Ann 2016;8:5184-8.
10. Available form: https://www.scfhs.org.sa/en/MESP5/TrainingPrograms/Assessment Of Ophthalmology Residency Program in Saudi Arabia: A Trance-Based Survey. J Med Educ Curric Dev 2019;6:1-7.
11. Halpern JA, Lee UJ, Wolff EM, Mittal S, Shoag JE, Lightner DJ, et al. Women in urology residency, 1978-2013: A critical look at gender representation in our specialty. Urology. 2016;92:20-5.
12. Friedman AA, Rosen L, Palmer LS. Parental status among successful applicants to urology residency. Urol Pract 2017;4:412-7.
13. Viola KV, Bucholz E, Yeo H, Piper CL, Bell RH Jr., Sosa JA. Impact of family and gender on career goals: Results of a national survey of 4586 surgery residents. Arch Surg 2010;145:418-24.
14. Rangel EL, Lyu H, Haider AH, Castillo-Angeles M, Doherty GM, Smink DS. Factors associated with residency and career dissatisfaction in childbearing surgical residents. JAMA Surg 2018;153:1004-11.
15. Cocci A, Patruno G, Gandaglia G, Rizzo M, Esperto F, Parnanzini D, et al. Urology residency training in Italy: Results of the first national survey. Eur Urol Focus 2018;4:280-7.

16. Le CQ, Lightner DJ, VanderLei L, Segura JW, Gettman MT. The current role of medical simulation in American Urological Residency Training Programs: An assessment by program directors. J Urol 2007;177:288-91.

17. Watson RA, Deshon GE Jr., Agee RE. Surgical experience with large animals. Important adjunct to residency training in urology. Urology 1982;20:154-6.

18. Nayan M, Houle AM, McDougall E, Fried GM, Andonian S. Establishing milestones in urology training: A survey of the Canadian academy of urological surgeons. Can Urol Assoc J 2012;6:168-74.

19. González CM, McKenna P. Challenges facing academic urology training programs: An impending crisis. Urology 2013;81:475-9.

20. Mickelson JJ, Macneil AE. Translational education: Tools for implementing the can MEDS competencies in Canadian urology residency training. Can Urol Assoc J 2008;2:395-404.

21. Miernik A, Sevcenco S, Kuehhas FE, Bach C, Buchholz N, Adams F, et al. Bringing excellence into urology: How to improve the future training of residents? Arab J Urol 2014;12:15-20.

22. Holst D, Kowalczewski TM, White LW, Brand TC, Harper JD, Sorenson MD, et al. Crowd-sourced assessment of technical skills: An adjunct to urology resident surgical simulation training. J Endourol 2015;29:604-9.

23. Safr IJ, Shrewsberry AB, Issa IM, Ogan K, Ritenour CW, Sullivan J, et al. Impact of remote monitoring and supervision on resident training using new ACGME milestone criteria. Can J Urol 2015;22:7959-64.

24. Okhunov Z, Safiullah S, Patel R, Juncal S, Garland H, Khajeh NR, et al. Evaluation of urology residency training and perceived resident abilities in the United States. J Surg Educ 2019;76:936-48.

25. Hellenthal NJ, Ramírez ML, Yap SA, Kurzrock EA. Manuscript publication by urology residents and predictive factors. J Urol 2009;181:281-6.