

# The ideal applicant to emergency medicine residency programs in Saudi Arabia; Program directors' view

Abdulbary Ali Alhalimi<sup>1\*</sup>, Khalid Nabeel Al-Mulhim<sup>2</sup>

1. College of Medicine, King Faisal University, Al-Ahsa, Saudi Arabia.

2. Department of Surgery, College of Medicine, King Faisal University, Al-Ahsa, Saudi Arabia.

\*Primary corresponding author: Abdulbary Ali Alhalimi; Email: [a.bary.halimi@gmail.com](mailto:a.bary.halimi@gmail.com).

Published online: 2022-06-26

**Abstract:** **Objective:** Emergency medicine (EM) is considered a competitive specialty worldwide with an acceptance rate of 57% in Canada, but it is even more competitive in Saudi Arabia with 18.7% acceptance. Factors that may influenced the applicant's acceptance into residency programs included letters of recommendation, interview performance, research experience, and gender. This study aims to determine the factors playing a role in applicants matching to EM residency programs in Saudi Arabia from the viewpoint of program directors.

**Methods:** A pilot study was done using a self-administered questionnaire distributed to EM residency program directors (PDs) in Saudi Arabia during the period of 16-21 November 2021. The data were analyzed using SPSS, and all ethical considerations were observed.

**Results:** Twenty-seven PDs participated in the study, 19 (70.4%) were male, and most were former PDs (59.3%). The most crucial aspect in the applicant's acceptance was the excellent impression in the interview (4.00 ± 1.00). The most crucial aspect of recommendation letters was a recommendation from a program director (29.6%). In addition, total duration of electives in EM (40.7%) was important, quality in EM research (29.6%) played a critical role, and professionalism (29.6%) was the factor sought during the interview. The PD's gender or status or the region of the program did not significantly affect the preference of the applicant's gender.

**Conclusion:** For those considering EM residency programs in Saudi Arabia, the chance of getting accepted can be increased by getting a recommendation from a program director, increasing the duration of electives in EM, focusing on the research quality, and showing professionalism during the interview.

**Keywords:** Emergency Medicine; Students, Medical; Internship and Residency; Physician Executives

Cite this article as: Alhalimi AA, Al-Mulhim KN. The ideal applicant to emergency medicine residency programs in Saudi Arabia; Program directors' view. *Front Emerg Med.* 2022;6(4):e50.

## 1. Introduction

Emergency medicine (EM) is an evolving specialty and is considered one of the most needed specialties and is one of the most competitive and demanding programs globally. In 2020, about 3640 individuals have applied to the united states of America (USA) EM residency programs, and 2567 (70.5%) have been accepted, while in 2021 in Canada, 2252 have applied and only 1284 have been accepted (57%); however, according to the Saudi Commission for health specialties (SCFHS), about 225 applicants had applied to Saudi EM residency programs in 2016, but only 42 (18.7%) were accepted, making it one of the most competitive specialties in Saudi Arabia (1-3).

Residency acceptance does not rely on one factor only, and many factors influence applicant's acceptance; some of these include the letters of recommendation, personal performance during the interview, grades in the required clerkship during medical school, the overall performance in the medical school based on grade point average (GPA), research publications, previous experience in the specialty, applicant's physical appearance, social media account of the applicant, rank in the medical school, and scores in the standardized

medical exams (4-18). However, these factors are subject to change, annually. In 2018, the program directors (PDs) in Canada were putting high values to the standardized letters of recommendations provided by the applicants as well as the interview performance for the residency program. However, these factors changed to reference letters and the applicant's curriculum vitae (CV) in 2021 (7, 13). Furthermore, these factors even vary between the programs in the same country. For instance, in Saudi Arabia, plastic surgery program directors put a high value on the interview performance and background experience in the same specialty, which is not the same in the urology residency program that mainly relies on the performance during the rotation and publications in the same field (9, 10).

Residency programs in Saudi Arabia are regulated by the Saudi Commission for health specialties (SCFHS) as the applications start every year on January and the programs start on October. Medical students must enter a licensing exam called the Saudi medical licensing exam (SMLE) to get licensed to practice medicine in Saudi Arabia. Also, the SCFHS matching system uses SMLE score that weighs 50% of applicants' cumulative score along with the Grade point aver-

age (GPA) that weighs 30%, and a portfolio that weighs 20%. The portfolio points are divided between research activity, postgraduate academic degree, community volunteering activities, strong interest in the specialty, being currently in a job as a health practitioner, and having an experience of six-months in the chosen specialty. Applicants choose their preferred specialties in an electronic matching system. Then, applicants are invited for the interviews based on their cumulative score and the chosen specialties' competitiveness and are assigned to be interviewed in one city only. Then, the second matching is done by program directors based on the results of the interview process, which differs between specialties and centers (19).

However, despite the importance of this topic, there is a lack of data regarding the factors that influence PDs' choice of an applicant applying to Saudi EM residency programs. Also, no evidence is present regarding the gender of the applicants and whether it affects their acceptance or not. In this article, which is the first of its type to discuss this issue about EM residency programs in Saudi Arabia, we are aiming to determine the factors that play a role in applicants matching to EM residency programs in Saudi Arabia from the viewpoint of the current EM residency PDs and to check if there is a gender bias toward a specific gender when choosing the applicants.

## 2. Methods

### 2.1. Study design and participants

A pilot study targeting current and former PDs of EM residency programs in Saudi Arabia was performed from 16 November 2021 till 21 November 2021 in order to determine the factors playing a role in applicants' acceptance in EM residency programs in Saudi Arabia. Current and former PDs were included in the study, and only those who had not agreed to participate in the study were excluded.

### 2.2. Data collection

An electronic self-administered questionnaire was sent to current and former PDs of EM residency programs in Saudi Arabia using a convenience sampling method. The questionnaire contained three main parts; the first one was about the demographic data of the PDs, the second one was about rating fifteen factors and determining their importance on a scale of 1 to 5, along with choosing the preferred gender of the applicant, and the third one was about determining the essential points regarding specific factors including the letters of recommendations (LORs), EM background experience, research experience, and interview performance. The original questionnaire was adopted from Shah Mardan et al.'s study, modified by adding new questions, then validated by consulting an EM specialist and a statistician (10).

### 2.3. Statistical analyses

Data analysis was done using the Statistical Package for social sciences (SPSS) version 25. Chi-square test was used for

**Table 1** Sociodemographic data of the participants

Sociodemographic data	No (%)
<b>Gender</b>	
Male	19 (70.4)
Female	8 (29.6)
<b>Program director status</b>	
Current program director	11 (40.7)
Former program director	16 (59.3)
<b>Region of service</b>	
Riyadh	9 (33.3)
Khobar	5 (18.5)
Dammam	3 (11.1)
Jeddah	3 (11.1)
Almadinah	2 (7.4)
Jubai	2 (7.4)
Makkah	2 (7.4)
Dhahran	1 (3.7)

qualitative data and the level of significance was considered to be 0.05 for all tests used in the study.

### 2.4. Ethical considerations

Ethical and institutional review board approvals were given by the research committee of the research deanship in King Faisal University with reference number (KFU-REC-2022-MAR-EA000543). Consent and ethical considerations were observed for each participant before starting the questionnaire.

## 3. Results

### 3.1. Demographical data of the program directors

Twenty-seven participants completed the questionnaire, and only one participant refused to complete the questionnaire with no mentioned clarification. 19 (70.4%) participants were male, and 8 (29.6%) were female. Most of the participants were former program directors (16 participants (59.3%)), while the rest were current program directors (11 participants (40.7%)). The majority of the participants were from Riyadh with 9 participants (33.3%) followed by Khobar with 5 (18.5%), then Dammam and Jeddah with 3 (11.1%) for each region, Al-Madinah, Jubail, and Makkah with 2 (7.4%) for each region, and finally Dhahran with only one (3.7%) participant.

### 3.2. Factors playing a role in an applicant's acceptance

The most crucial aspect in all regions was excellent impression in the interview (mean = 4.00, standard deviation = 1.00), followed by background experience in EM in terms of electives (mean = 3.85, standard deviation = 0.99), then oral or poster presentations and grades of EM clerkship during medical college (mean = 3.81, standard deviation = 1.00). In contrast, the least crucial ones were content of applicant's social

**Table 2** Items that the program directors consider based on their importance (scaled from 1 to 5 with five meaning very important and one not important at all)

Rank	Item	Mean ± SD
1.	Good impression in the interview	4.00 ± 1.00
2.	Background experience in Emergency medicine (e.g., electives)	3.85 ± 0.99
3.	Oral or Poster presentation on events	3.81 ± 1.00
4.	Grades of Emergency clerkship during medical school	3.81 ± 1.00
5.	Previous research experience	3.74 ± 1.16
6.	Extracurricular activities	3.63 ± 1.39
7.	Applicant's physique	3.59 ± 1.22
8.	Medical school of graduation	3.59 ± 1.19
9.	SMLE score	3.52 ± 1.16
10.	Fresh graduate	3.44 ± 1.21
11.	Passing other medical exams (e.g., USMLE, MCCQE)	3.30 ± 1.51
12.	Content of applicant's social media accounts	3.30 ± 1.24
13.	Honors or awards during medical school	3.30 ± 1.24
14.	Being on the dean's list	3.07 ± 1.44
15.	Grade Point Average (GPA)	3.07 ± 1.07

SD: standard deviation; SMLE: Saudi Medical Licensing exam.

**Table 3** Items that are considered by the program directors according to the region of service of the program directors.

Criteria	All regions	AL Madinah	Makkah	Jeddah	Riyadh	Dammam	Dhahran	Jubail	Khobar
	n. 27	n. 2	n. 2	n. 3	n. 9	n. 3	n. 1	n. 2	n. 5
Good impression in the interview	4.00	3.5	4	4.33	3.56	5	3	3.5	4.6
Background experience in Emergency medicine (e.g., electives)	3.85	4.5	3.5	4.33	3.22	4.33	5	3.5	4.2
Oral or Poster presentation on events	3.81	4	4.5	3.67	3.67	4	4	4	3.6
Grades of Emergency clerkship during medical school	3.81	3.5	5	4	4	3	4	3.5	3.6
Previous research experience	3.74	4.5	4.5	2.67	3.89	3.33	1	4	4.2
Extracurricular activities	3.63	3	4.5	2.67	3.78	3	5	3.5	4
Applicant's physique	3.59	4	4	2.67	3	4.33	4	4.5	4
Medical school of graduation	3.59	3	3.5	4	3.33	3.67	3	3	4.4
SMLE score	3.52	4	3.5	3.67	3.22	3.33	4	4	3.6
Fresh graduate	3.44	3	3.5	3.33	3	4.33	5	3	3.8
Passing other medical exams (e.g., USMLE, MCCQE)	3.30	3	2.5	3.67	3.11	3	5	4	3.4
Content of applicant's social media accounts	3.30	3	3	2.33	3.33	3.67	5	4	3.6
Honors or awards during medical school	3.30	3.5	4	4	3.11	3	5	3	2.8
Being on the dean's list	3.07	3	2.5	2.33	2.89	3.33	5	4	3.2
Grade Point Average (GPA)	3.07	3.5	2	3.33	3.11	3	3	2.5	3.4

SD: standard deviation; SMLE: Saudi Medical Licensing exam.

media accounts and honors or awards during medical school (mean = 3.30, standard deviation = 1.24), being on the dean's list (mean = 3.07, standard deviation = 1.44), and the GPA of the applicant (mean = 3.07, standard deviation = 1.07). The dean's list is a list of 10 students with the best academic and extracurricular performance throughout the medical school announced by each college at the time of graduation of each batch of students.

When divided into regions, the most critical aspect in the western region were the background experience of EM in terms of electives and grades of EM clerkship during the medical college (mean = 4.14). In contrast, in the central re-

gion, it was the grades of EM clerkship during the medical college (mean = 4.00), and finally, in the eastern region, it was the good impression in the interview (mean = 4.63). Table 3 provides more illustrated data with regards to each city.

### 3.3. Program director's gender and gender preferences

Table 4. demonstrates the relationship between PDs' demographics and the preference of applicants' gender. Using the chi-square and Fisher's exact test, no relation was found between the gender of the PD and gender preferences (p-value = 0.555), the status of the PD and the gender preferences (p-

**Table 4** Relationship between demographic data of the program directors and their preference of applicant's gender

Variable	Male	Female	No difference	p-value <sup>a</sup>
	Number (%)			
<b>Gender of the program director</b>				
Male	4 (14.8%)	4 (14.8%)	11 (40.7%)	0.555
Female	2 (7.4%)	3 (11.1%)	3 (11.1%)	
<b>Program director status</b>				
Current	3 (11.1%)	2 (7.4%)	6 (22.2%)	0.772
Former	3 (11.1%)	5 (18.5%)	6 (22.2%)	
<b>Region of service</b>				
Almadinah	0 (0%)	1 (3.7%)	1 (3.7%)	0.286
Dammam	1 (3.7%)	0 (0%)	2 (7.4%)	
Dhahran	1 (3.7%)	0 (0%)	0 (0%)	
Jeddah	0 (0%)	0 (0%)	3 (11.1%)	
Jubail	0 (0%)	1 (3.7%)	1 (3.7%)	
Khobar	2 (7.4%)	0 (0%)	3 (11.1%)	
Makkah	1 (3.7%)	0 (0%)	1 (3.7%)	
Riyadh	1 (3.7%)	5 (18.5%)	3 (11.1%)	

<sup>a</sup> Fisher's exact test (Statistical significance of <0.05)

**Table 5** Important aspects of application for acceptance

Aspect of application	Number (%)
<b>The most important aspect regarding letters of recommendation</b>	
Recommendation from a program director	8 (29.6)
Reputation of the recommending person	5 (18.5)
Recommendation by a phone call	4 (14.8)
The language of the recommendation, whether it is written or by phone	4 (14.8)
Recommendation by a written letter	3 (11.1)
Number of recommendations	2 (7.4)
Recommendation from a department head	1 (3.7)
<b>EM background (department)</b>	
The applicant worked/took an elective at our department	16 (59.3)
The applicant worked/took an elective regardless of the department	11 (40.7)
<b>EM background (timing)</b>	
Total duration of the work/electives (regardless of the timing)	11 (40.7)
The applicant worked/took an elective during medical school	10 (37.0)
The applicant worked/took an elective during the internship	6 (22.2)
<b>Research experience</b>	
Quality of research in Emergency Medicine	8 (29.6)
Quality of research regardless of the specialty	7 (25.9)
Publishing in prestigious journals in Emergency Medicine	6 (22.2)
Quantity of publications in Emergency Medicine	3 (11.1)
Publishing in prestigious journals regardless of the specialty	2 (7.4)
Quantity of publications regardless of the specialty	1 (3.7)
<b>Interview process</b>	
Professionalism	8 (29.6)
Communication skills	6 (22.2)
Commitment	5 (18.5)
Initiative	3 (11.1)
Teamwork	3 (11.1)
Knowledge base	2 (7.4)
Differential diagnosis skill	0 (0.0)
Leadership qualities	0 (0.0)

EM: emergency medicine.

value = 0.772), or the region of service and the gender preferences (p-value = 0.286).

### 3.4. Specific points that play a major role in the applicant's acceptance

Regarding the essential aspects of letters of recommendations (LORs), the most influential one in the applicant's acceptance was a LOR from a program director (8; 29.6%), while the least influential one was a recommendation from a program head (1; 3.7%). Regarding the timing of EM background, program directors preferred longer total duration of the electives (40.7%) regardless of the time of taking the electives, whether they were taken during the medical school or in the internship. When talking about the place of EM electives, taking it at the department of the desired residency was more influential (16; 59.3%) than taking an elective regardless of the department (11; 40.7%). Research experience was appreciated mainly through the quality of EM research (8; 29.6%), followed by the quality of the research regardless of the specialty (7; 25.9%). During the interview, most PDs agreed that professionalism was the most sought factor (8; 29.6%), followed by the applicant's communication skills (6; 22.2%), with differential diagnosis skill and leadership qualities playing no role in the applicant's acceptance.

## 4. Discussion

The findings of this study provided a comprehensive guide to students and medical graduates considering EM residency programs provided by the SCFHS in Saudi Arabia so they can focus their work and effort on what could positively influence their applications and increase their chances of getting an acceptance and getting matched into EM residency programs. The medical colleges or mentors can also use these findings to change policies and provide better professional guidance to students early on and during medical school, which will help structure mentorship programs in medical colleges.

To our knowledge, this study is the first of its type to be conducted in Saudi Arabia to comprehensively discuss the factors that play a role in applicants choosing EM residency programs in Saudi Arabia from the viewpoint of EM residency PDs.

In this study, the significant points that played a role in the applicant's acceptance were excellent performance during the interview, background experience in the EM field in terms of rotations, oral or poster presentation at events, and grades of the EM clerkship during the medical school with mean scores of (4.00), (3.85), and (3.81) out of 5, respectively. On the other hand, the minor influential factors were being on the dean's list and the applicant's GPA with a mean score of (3.07). In the USA, LORs from an attending physician of the same specialty, the ability to work legally without a visa, and audition rotation in the PD's department were the most positive influential factors in accepting an applicant, with a mean score of (4.8), (4.7), (4.6) out of 5, respectively (20). This result is not much different than the findings in Canada, as

Hale et al. found that the essential elements of the applicant were LORs (38.5%), CV (30.8%), and the cover letter of the applicant (15.4%). In contrast, the least important ones were research experience and the dean's letter certifying the student's activities in the school (0.0%) (6). However, the situation is a little bit different in Kuwait as Marwan et al. showed that the applicant's performance during the interview, nationality of the applicant, and the research experience were the most important factors affecting acceptance to a program with mean scores of (4.75), (3.25), and (2.75) out of 5, respectively. At the same time, the minor influential factors were grades of pre-clinical courses, the rank in the class, and the gender with a mean score of (1.5) out of 5 (12).

When comparing the data of this study with the local programs, we found that Shah Mardan et al.'s study has got the same results in Plastic residency programs as in this study, showing that good impression during the interview, background experience in plastic surgery, and research experience were the most influential factors with means of (6.2), (5.8), and (5.4) out of 7. In contrast, the minor influential factors were the Saudi Medical Licensing exam (SMLE) score and holding a higher academic degree with means of (4.6) and (3.7) out of 7 (10). These results could be attributed to the primary source of our questionnaire, which is Shah Mardan et al.'s study (10). On the other hand, urology residency programs showed different results as presented by Alyami et al.'s study showing that the most important factors were the performance during the rotation of the center, publications in urology, and the number of electives in urology with means of (4.52), (4.3), and (4.26) out of 5, respectively, were the least influential factors were the recommendation letters from non-urologists and quality reference letters from non-urologists with means of (2.7) and (2.43) out of 5, respectively (9). Regarding gender bias, it was not significantly related to the PD's gender, region of service, or the status of the program director, as presented in table 4. This finding is similar to what was found in Marwan et al.'s study, which showed that applicants' gender had nearly no effect on acceptance to EM residency programs (12). However, other studies have shown different results, like in J. Andrusaitis et al.'s study a gender bias was found in favor of females, showing that females received better letters of recommendation after taking rotations during medical school compared to their male counterparts, but males were superior in residency exam performance (8). Also, similar and more interesting findings were demonstrated in G. De Oliviera et al.'s study, which showed that the female gender was significantly associated with successful matching into anesthesia residency programs in the USA (11).

As shown by this study, a recommendation from a program director played the most crucial part in the applicant's acceptance with regards to LORs. This finding was one of a kind, as Shah Mardan et al. have shown that the recommendation by a phone call influenced the applicant's acceptance more positively. In contrast, Alyami et al. found that LORs, even



from urologists, played an average role in applicants' acceptance (9, 10). Regarding the background experience of the specialty, this study has shown that taking an elective in the same department they are applying to and the total duration of the rotations played a crucial role in the applicant's acceptance. This finding was similar to both Shah Mardan et al.'s and Alyami et al.'s studies, in which performance during the rotation was the most crucial factor in getting accepted into urology programs (9, 10). Quality of research, preferably in the EM field, was superior to the number of publications and the journal's rank. This finding was identical to Shah Mardan et al.'s findings, but differed from Alyami et al.'s as they showed that the number of publications was more important (9, 10). Finally, regarding the interview, professionalism was the most sought factor according to the current study. However, a different finding was found in Hale Michaele et al.'s study, which showed that honesty and straightforward answers were the most critical factors during the interview (6). A suggestion for future studies is to perform a qualitative research with the program directors following each applicant's application into EM residency programs to get a deeper insight into the factors playing a role in the acceptance. Also, more studies on other specialties can be done by our colleagues, or a central data center providing up-to-date data from the SCFHS can facilitate the process and direct medical graduates into their preferred programs.

## 5. Limitations

Even though we worked hard to eliminate any limitations from this study, we could not avoid them all. This pilot study used a self-administered questionnaire, which can give less reliable results as it depends on the participant's understanding of the questions. Also, not all regions nor program directors of EM residency programs have participated in the study, as the questionnaire was distributed conveniently. Furthermore, the sample size is small because the EM residency program is an emerging program in Saudi Arabia with few centers providing it.

## 6. Conclusion

For medical graduates considering EM residency programs in Saudi Arabia, specific points might increase their chance of acceptance: getting a LOR from an EM residency program director, taking more EM rotations at the center of application, focusing on the quality of research rather than the quantity, and showing professionalism during the interview. It should be kept in mind that the applicant's gender plays no role in their acceptance in EM residency programs in Saudi Arabia.

## 7. Declarations

### 7.1. Acknowledgment

The authors would like to acknowledge Ms. Areej Al-Fatani for her invaluable input into the statistical analysis of this study and Mrs. Sokinah Almusalami for her invaluable cooperation in the development and editing of the questionnaire. Also, we would like to acknowledge the research committee of SASEM 7 as they have given extremely helpful tips to organize this project.

### 7.2. Authors' contribution

Abdulbary Alhalimi, MBBS and Khalid Al-Mulhim, MD, (E-mail: Knalmulhim@kfu.edu.sa) are the two authors of this paper. AA and KA conceived and designed the study, conducted research, and provided research materials. KA collected and organized data. AA analyzed and interpreted data. AA and KA wrote the initial and final draft of article, and provided logistic support. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

### 7.3. Conflict of Interest

The authors declare that there is no conflict of interest.

### 7.4. Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

## References

- 2021 CaRMS Forum. 2021. [Available from: <https://www.carms.ca/pdfs/2021-carms-forum.pdf>].
- Ware J, Al Sultan M. The selection of graduates for residency training and the research that is needed. *J Health Spec.* 2015;3:189-90.
- ERAS [Internet]. 2021. [Available from: <https://www.aamc.org/system/files/2019-10/services-eras-preliminary-data-counts-residency-applicants-specialty-year-10172019.xlsx>].
- Cain J, Scott DR, Smith K. Use of social media by residency program directors for resident selection. *Am J Health Syst Pharm.* 2010;67(19):1635-9.
- Shultz K, Mahabir R, Song J, Verheyden C. Evaluation of the current perspectives on letters of recommendation for residency applicants among plastic surgery program directors. *Plast Surg Int.* 2012; 2012: 728981.
- Hale MK, Frank JR, Cheung WJ. Resident selection for emergency medicine specialty training in Canada: a survey of existing practice with recommendations for programs, applicants, and references. *CJEM.* 2020;22(6):829-35.
- Lakoff J, Howse K, Cofie N, Heeneman S, Dalgarno N. Analysis of factors affecting Canadian medical students' success in the residency match. *Can Med Educ J.* 2020;11(3):e43-55.

8. Andrusaitis J, Clark C, Saadat S, Billimek J, Paradise S, Wray A, et al. Does applicant gender have an effect on standardized letters of evaluation obtained during medical student emergency medicine rotations? *AEM Educ Train.* 2019;4(1):18-23.
9. Alyami FA, Almuhaideb MA, Alzahrani MA, Althunayan AM, Almannie RM. Survey of Saudi urology program directors: What do you look for in a candidate? *Urol Ann.* 2021;13(3):272-6.
10. Mardan QNS, Alamari NA, Alzahrani HM, Almarghoub MA, Al Saud NA, Alqahtani MS. The ideal applicant to the Saudi plastic surgery residency program. *Plast Reconstr Surg Glob Open.* 2021;9(2):e3441.
11. De Oliveira GS, Akikwala T, Kendall MC, Fitzgerald PC, Sullivan JT, Zell C, et al. Factors affecting admission to anesthesiology residency in the United States: choosing the future of our specialty. *Anesthesiology.* 2012;117(2):243-51.
12. Marwan Y, Ayed A. Selection criteria of residents for residency programs in Kuwait. *BMC Med Educ.* 2013;13:4.
13. Negaard M, Assimacopoulos E, Harland K, Van Heukelom J. Emergency medicine residency selection criteria: an update and comparison. *AEM Educ Train.* 2018;2(2):146-53.
14. Klammer RM, Haydel MJ, Gallahue F, Bruno EC, Langdorf MI, Cheaito MA, et al. Program visits and residency interviews. *J Emerg Med.* 2019;57(4):e133-9.
15. Jewell C, David T, Kraut A, Hess J, Westergaard M, Schnapp BH. Post-interview thank-you communications influence both applicant and residency program rank lists in emergency medicine. *West J Emerg Med.* 2020;21(1):96-101.
16. Hartman ND, Lefebvre CW, Manthey DE. A narrative review of the evidence supporting factors used by residency program directors to select applicants for interviews. *J Grad Med Educ.* 2019;11(3):268-73.
17. Katzung KG, Ankel F, Clark M, Lawson LE, DeBlieux PM, Cheaito MA, et al. What do program directors look for in an applicant? *J Emerg Med.* 2019;56(5):e95-101.
18. Maxfield CM, Thorpe MP, Desser TS, Heitkamp DE, Hull NC, Johnson KS, et al. Bias in radiology resident selection: do we discriminate against the obese and unattractive? *Acad Med.* 2019;94(11):1774-80.
19. Specialities S commission for health. Principles of matching in Medical residency programs, 2022. Saudi commission for health specialities. 2022. [Available from: [https://scfhs.org.sa/sites/default/files/inline-files/matching%20booklet%202022\\_0.pdf](https://scfhs.org.sa/sites/default/files/inline-files/matching%20booklet%202022_0.pdf)].
20. National Resident Matching Program, Data Release and Research Committee: Results of the 2021 NRMP Program Director Survey. National Resident Matching Program, Washington, DC. 2021. [Available from: <https://www.nrmp.org/wp-content/uploads/2021/11/2021-PD-Survey-Report-for-WWW.pdf>].