

Predictors of performance in an ophthalmology residency program

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ABSTRACT • RÉSUMÉ

Objective: To assess the value of current selection criteria and additional factors as predictors of performance in an ophthalmology residency training program.

Design: A retrospective study.

Participants: Data were collected from the files of 166 residents who were collectively trained in an ophthalmology residency program from 2000 to 2013.

Methods: The program's selection criteria included medical school grade point average (GPA), Saudi licensing examination (SLE) score, multiple-choice question ophthalmology selection (MCQ) examination score, and interview mark. Indicators of performance included average scores in the promotion examination for 4 years of training (average R), King Saud University fellowship examination (KSU) score, and Saudi Board in Ophthalmology examination (SBO) score. An average of KSU and SBO scores was also used as a performance indicator. Times of program completion and average performance score across all years in the residency program were used as second-level indicators of performance.

Results: There were strong correlations between the MCQ examination score and each training performance indicator (average R , KSU score, SBO score, and average of KSU and SBO scores; $p = 0.002, 0.008, 0.05,$ and $0.002,$ respectively). The interview mark correlated well with average R ($p = 0.001$) but not with other indicators. The MCQ examination score and the interview mark were the only predictors of second-level indicators of performance ($p = 0.009$ and $0.029,$ respectively).

Conclusions: The MCQ examination score and interview mark were the 2 best predictors of performance as an ophthalmology resident. GPA and SLE score were poor predictors of performance.

Objet : Évaluer la valeur des critères de sélection en vigueur et de facteurs additionnels comme prédicteurs de la performance durant un programme de résidence en ophtalmologie.

Nature : Étude rétrospective.

Participants : Les données ont été tirées des dossiers de 166 résidents formés collectivement dans le cadre d'un programme de résidence en ophtalmologie entre 2000 et 2013.

Méthodes : Les critères de sélection du programme étaient la moyenne générale à l'école de médecine, la note à l'examen d'accréditation saoudien (note SLE), la note à l'examen de sélection en ophtalmologie (questions à choix multiples (QCM)) et la note à l'entrevue. Les indicateurs de la performance scolaire étaient la note moyenne à l'examen de passage pour quatre années d'études (moyenne R), la note à l'examen de fellowship de la King Saud University (note KSU) et la note à l'examen du Saudi Board of Ophthalmology (note SBO). La moyenne des notes KSU et SBO a aussi été utilisée comme indicateur de la performance. Le délai nécessaire pour achever le programme et la cote de performance moyenne pour toutes les années de résidence ont été utilisés comme indicateurs secondaires.

Résultats : Il y avait de fortes corrélations entre la note à l'examen QCM et chacun des indicateurs de la performance scolaire (moyenne R , note KSU, note SBO et moyenne KSU-SBO; valeurs p respectives de $0,002,$ de $0,008,$ de $0,05$ et de $0,002$). La note à l'entrevue présentait une bonne corrélation avec la moyenne R (valeur p de $0,001$), mais pas avec les autres indicateurs. La note à l'examen QCM et la note à l'entrevue étaient les seuls prédicteurs des indicateurs de performance secondaires (valeurs p respectives de $0,009$ et de $0,029$).

Conclusion : La note à l'examen QCM et à la note à l'entrevue étaient les deux meilleurs prédicteurs des résultats scolaires d'un résident en ophtalmologie. La moyenne générale et la note SLE étaient de piètres prédicteurs des résultats scolaires.

Ophthalmology is considered one of the most competitive medical specialties in which to obtain a residency training position in Saudi Arabia. In a study done by Green et al, ophthalmology was among the most competitive specialties in the United States.¹ Each year, the number of applicants to ophthalmology residency programs consistently exceeds the number of available positions. The increasing numbers of qualified applicants, coupled with the relatively fixed number of positions, result in an increasingly competitive selection process and raise the

issue of which criteria are most helpful in selecting ophthalmology residents who will perform well in the program.

According to the Ophthalmology Matching Program in the United States, the overall match rate for ophthalmology over the last 10 years ranges from 69% to 77% (www.sfmatch.org).² The widely used resident selection process in ophthalmology relies on academic metrics (e.g., medical school grades, class rank, licensing examination results, and membership in the medical school honour society).³

In a survey of ophthalmology program directors, chairpersons, and members of resident selection committees, the following factors were considered most important in resident selection: interview performance (95.4%), clinical course grades (93.9%), letters of recommendation (83.1%), and board scores (80%).⁴ In 2 multispecialty surveys of program directors, it was found that the most important academic selection criteria across common medical specialties (including ophthalmology) were grades in required clerkships.^{1,5} There are few long-term studies correlating selection criteria with the resident performance in ophthalmology.^{1,3,6}

The ophthalmology residency training program in Riyadh is a 4-year program and is considered one of the large ophthalmology training programs in the Middle East. It was founded in 1984, and 12–14 residents are accepted every year. To ensure the training of the highest quality clinicians, it is crucial to assess whether current selection criteria are predictive of performance as a resident. Moreover, program administrators need to identify factors that are associated with poor performance early in the training process to allow for possible proactive intervention.

MATERIALS AND METHODS

A retrospective review of a total of 166 residents (out of a total of 243 applicants) who were collectively trained in the Riyadh ophthalmology residency program from 2000 to 2013 was performed. Because the study did not involve patient identifiers or protected health information, it was exempted from review by the institutional review board. Medical student applications and resident files were reviewed. Selection criteria analyzed from the medical student applications included medical school grade point average (GPA), Saudi licensing examination (SLE) score, multiple-choice question (MCQ) ophthalmology selection examination score, and interview mark. The MCQ examination is a multiple-choice admission examination that focuses on basic ophthalmology knowledge, the eye in association with systemic diseases, general medicine, and ethics questions. Two separate committees of expert ophthalmologists conducted program interviews. The first committee evaluated the candidates' leadership, public service, and personalities, whereas the second committee evaluated the candidates' research activities, utilization of educational services, and responses to stress. Each candidate spent 12 minutes on each committee. Each interview committee consisted of 4 members and every member gave individual marks for each candidate. The individual marks were then averaged, and the average mark of each committee was submitted. The total interview marks of both committees then were averaged, and the final mark was given as a percentage out of a possible 100%.

Performance in the residency program was judged according to the following criteria: average score from the yearly promotion examination (average *R*), King Saud

University fellowship examination (KSU) score, and Saudi Board in Ophthalmology examination (SBO) score. (The KSU is considered another board examination.) The analysis took into consideration the fact that some residents were still in the program or for other reasons did not sit for the SBO.

Selection criteria were analyzed as potential predictors of performance. Residents' performances during training were classified as "below average," "average," or "above average" based on an average of 2 examination scores and the time they took to complete the program (except for residents who were still undergoing training). For residents still undergoing training, scores from the 2 most recent promotion examinations (examination *R*) were averaged. For residents who had completed the program and taken the KSU but not the SBO, the fourth-year promotion examination and KSU scores were averaged. For residents who had completed the program and taken the KSU and SBO, scores from those 2 examinations were averaged.

Residents who had an average examination score of ≥ 85 and completed the program in 4 years were classified as "above average." Residents who had an average examination score between 75 and 85 and completed the program in 4 years were classified as "average." Residents who had an average examination score of < 75 or who had to repeat any of the training years (i.e., did not complete residency training in 4 years) were classified as "below average."

STATISTICAL ANALYSES

Data were collected and stored in a Microsoft Excel (Office 2007, Redmond, WA) sheet and then analyzed using SPSS version 20.0 (IBM Inc, Chicago, Ill.). Mean and SD were calculated for all quantifiable measures. To detect potential correlations among different study variables, Pearson correlation coefficients (ρ) were calculated.

Table 1—Correlation between selection criteria and training performance

Index (100%)	Below Average,* mean (\pm SD)	Average, [†] mean (\pm SD)	Above Average, [‡] mean (\pm SD)	ρ
MCQ examination		74.0 (7.5)	76.4 (7.3)	79.8 (6.3)
0.009				
Interview	77.5 (12.7)	79.8 (13.1)	86.3 (8.9)	0.029
GPA	61.1 (22.7)	62.3 (13.2)	57.0 (21.6)	0.560
SLE	56.2 (22.9)	50.4 (21.9)	51.9 (20.8)	0.319
Total score	67.2 (11.6)	67.2 (8.5)	68.8 (9.9)	0.825

MCQ, multiple-choice question ophthalmology selection; GPA, medical school grade point average; SLE, Saudi licensing examination.

*Below average if the candidate did not complete the training in 4 years or the score was < 75 in average in one of the following: Saudi Board in Ophthalmology examination (SBO) score + King Saud University fellowship examination (KSU) score (SBO + KSU) if SBO taken, or fourth-year promotion examination + KSU, or average of the last 2 years' promotion examination (if still ongoing training). [†]Average if the candidate completed the training in 4 years and the score was 75–84 in average in one of the following: (SBO + KSU) if SBO taken, or fourth-year promotion examination + KSU, or average of the last 2 years' promotion examination (if still ongoing training). [‡]Above average if the candidate completed the training in 4 years and the score was ≥ 85 in average in one of the following: (SBO + KSU) if SBO taken, or fourth-year promotion examination + KSU, or average of the last 2 years' promotion examination (if still ongoing training).

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