

Ophthalmology residency training in Jordan: an evaluation of quality and comparison with international standards

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Abstract

• **AIM:** To evaluate Jordanian ophthalmology residency programs in achieving competencies outlined by the International Council of Ophthalmology (ICO) and residents' satisfaction with available training programs in Jordan, and to highlight weakness points that may be improved and strengthened.

• **METHODS:** A closed –ended questionnaire was circulated to all ophthalmologists who completed their training in Jordanian institutions between 2006 and 2011, to measure the quality of residency training and satisfaction level with regards to clinical conferences, journal clubs, scientific lectures, wet lab sessions, simulations, outpatient clinics and operating room training. Barriers to a successful board exam were cited. All ophthalmologists had official residency training in Jordanian Hospitals; this includes military, university, governmental and private sector hospitals.

• **RESULTS:** Sixty–one questionnaires completed out of 69 circulated. Males (75.4%) were more than females. Mean age was 32.5±3.27y. A total 21 (34.4%) responders expressed an overall satisfaction, 38 (62.3%) were dissatisfied and 2 (3.3%) were equivocal. Respondents reported insufficient exposure to low–vision rehabilitation 57(93.4%), or refraction and glasses prescription 34 (55.7%). Regarding operative experiences, the mean cataract extraction per–resident was 43 cataracts; the number of phacoemulsification surgery was 2.96 per–resident, 46 (75.4%) of responders never did a single phacoemulsification

during residency. Nine (14.8%) had training in refractive surgery, and 15 (24.6%) assisted orbital surgery. Forty–four (72.1%) never assisted in vitreoretinal surgery. Among The graduates surveyed, 14 (23.0%) passed Jordanian licensing board exam at the first attempt, and felt that their residency programs adequately prepared them for the examinations.

• **CONCLUSION:** Around two thirds (62.3%) of ophthalmologists expressed dissatisfaction with residency training at Jordanian programs, further study is required to assess each program separately and evaluate the system of accreditation in Jordanian residency programs.

• **KEYWORDS:** trainees' perspectives; residency training; international standards

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INTRODUCTION

The Jordanian ophthalmology programs are relatively new and rapidly evolving since 1982^[1]. Currently, there are four major bodies accredited by the Jordanian board committee to train ophthalmology residents in Jordan; these are governmental hospitals, military hospitals, two university hospitals [Jordan University and Jordan University of Science and Technology (J.U.S.T)] and The Islamic hospital. However, there are also some private non-accredited programs training ophthalmology residents such as Ibn Al-Haytham hospital, and Specialty Eye hospital. The 2011 survey for the Jordanian National Department of Statistics documented only 314 ophthalmologists practicing in Jordan^[2]. This translates into a single ophthalmologist responsible for the eye care of 19 901 citizens^[3]. To our knowledge, there is no data published about the number of ophthalmologists who graduated from training in Jordan, nor any formal evaluation of the quality of ophthalmology training programs in Jordan.

The primary goal of an ophthalmology training program is to diagnose eye diseases through detailed eye examination, and manage vision disorders. Ophthalmologists must have expertise in assessment and diagnosis of visual signs and symptoms. The standard curriculum for this specialty degree should enable residents to acquire enough competencies in order to ensure good clinical practice in various fields of ophthalmology, such as anterior segment, glaucoma, oculoplastics, and posterior segment surgeries. Some studies have been performed to evaluate the accuracy of current ophthalmology curriculums^[4,5]. Competency based curriculums is aimed to fulfill adequate patient care, by acquiring sufficient knowledge, practice-based learning, interpersonal and communicational skills, professionalism, and system-based practice^[4,5]. In Jordan, the ophthalmology training residency program takes 4y to complete, at the end of the training program the ophthalmologist is required to sit for the Jordanian board examination; without it, the candidate is not labeled as a specialist. The Jordanian Board exam is held twice a year usually in February and August. The committee is picked from the finest well known ophthalmologists in Jordan^[1]. The board committee is changed every 4y. The Jordanian National Board of Ophthalmology is in charge of monitoring the training process in ophthalmology departments all over the country. The competencies of the residents should continuously be assessed by standard tools. The International Council of Ophthalmology (ICO) published a paper in 2006 outlining the core competencies that residents should achieve upon graduating from ophthalmology specialty training programs^[6]. The document meticulously defines the goals, expectations, knowledge, competencies, and technical training objectives that should be included in postgraduate ophthalmology curriculum.

Jordanian ophthalmology residency programs have not been systematically evaluated in relation to these standards. In fact, there has been no formal investigation into the effectiveness of Jordanian ophthalmology residency programs in recent years. In the present study, we evaluate the adequacy of Jordanian ophthalmology residency training programs in achieving the objectives outlined by the ICO, as well as evaluate the satisfaction and effectiveness of such programs in preparing residents for the Jordanian board examinations and for entering clinical practice.

SUBJECTS AND METHODS

This cross-sectional study was conducted in 2012. Jordanian young ophthalmologists, who were granted the Jordanian board license between February 2006 and October 2011, were asked to fill out a questionnaire. According to the Jordanian Medical Council, there are 78 registered ophthalmologists in the previous mentioned period. Sixty-nine of them had received training in Jordanian

Table 1 Demographic characteristics of all respondents (n=61)

| Parameters | n (%) |
|--|------------|
| Mean age±SD, (a) | 32.5±3.28 |
| Sponsored residency training ¹ | 37 (60.7) |
| Mean number of doctors training during residency | 10.8±6.1 |
| Mean number of consultants in the department | 6.5±3.2 |
| Year of completion of training | |
| 2011 | 19 (31.14) |
| 2010 | 14 (22.9) |
| 2009 | 5 (8.2) |
| 2008 | 8 (13.1) |
| 2007 | 8 (13.1) |
| 2006 | 7 (11.5) |
| Place of training | |
| Military hospitals | 24 (39.4) |
| Governmental hospitals | 18 (29.5) |
| University hospitals | 8 (13.1) |
| Private sector hospitals | 11 (18.0) |
| Current work status of graduates | |
| Pursuing fellowship internationally | 6 (9.8) |
| Working in community hospitals | 34 (55.7) |
| Working in military hospitals | 7 (11.5) |
| Working in private practice | 14 (23) |

¹Doctors receiving salary during training.

hospitals. A closed-ended questionnaire was developed and circulated to the participants. Some doctors were contacted by phone, or had the questionnaire emailed to them because they lived in distant areas. The questionnaire contains 43 questions which are shown the tables of this article; statistics was done using SPSS software (Version 17.0; SPSS Inc., Chicago, IL, USA). All the statistics was rechecked again by a statistician. The questionnaire was filled in the presence of one of the authors in this article (Al-Salem KM, Al-Salem MM, Abu Al-Dabaat M, Shihadeh W, and Al-Sarayrah FA). Verbal informed consent was obtained from all participants prior to filling up the Questionnaire. All parts of the questionnaire were explained thoroughly, in case the participant had any questions. Finally, All participates knew that the information they are given up will be used for study purposes.

RESULTS

A total of 69 questionnaires were given out; 61 of these were completed and returned, giving a response rate of 88.4% . Males formed 75.4% of the studies group. The mean age of the responders was 32.5 ±3.26y; 60 (98.4%) were young ophthalmologists (aged under 40). The average period after the board was 2.2y for the responders. Table 1 demonstrates the demographic characteristics of all respondents.

The overall satisfaction of residents with their residency program is illustrated in details in Table 2. Only 21 out of 61 residents (34.4%) were generally satisfied with their residency program, leaving around two thirds dissatisfied with the quality of teaching in most branches. Main areas of

Table 2 Overview of residency program satisfaction (n=61)

| Questions | Satisfied | Neutral | Dissatisfied | n (%) |
|---|-----------|---------|--------------|-------|
| What is your overall level of satisfaction with your ophthalmology residency program? | 21 (34.4) | 2 (3.3) | 38 (62.3) | 0 (0) |
| How do you feel about the operative experience in the following areas? | | | | |
| Case volume | 3 (4.9) | 4 (6.6) | 54 (88.5) | 0 (0) |
| Case complexity | 2 (3.28) | 5 (8.2) | 54 (88.5) | 0 (0) |
| Case variety | 5 (8.2) | 6 (9.8) | 50 (82.0) | 0 (0) |
| How do you feel about the quality of teaching in the following settings? | | | | |
| Formal didactic teaching | 3 (4.9) | 3 (4.9) | 55 (90.2) | 0 (0) |
| Operating room | 4 (6.6) | 4 (6.6) | 53 (86.8) | 0 (0) |
| Clinic/outpatient office | 14 (23) | 3 (4.9) | 44 (72.1) | 0 (0) |
| Hospital-based rounds | 12 (19.7) | 2 (3.3) | 47 (77.0) | 0 (0) |
| Grand rounds | 16 (26.2) | 2 (3.3) | 43 (70.5) | 0 (0) |
| Morbidity and mortality round | 0 (0) | 0 (0) | 61 (100) | 0 (0) |
| Surgical skills/wet laboratory | 0 (0) | 0 (0) | 61 (100) | 0 (0) |
| Videotapes of surgical procedures | 0 (0) | 0 (0) | 61 (100) | 0 (0) |
| Surgical virtual simulation system | 0 (0) | 0 (0) | 61 (100) | 0 (0) |
| Conferences | 14 (23) | 2 (3.3) | 45 (73.7) | 0 (0) |
| Journal club | 2 (3.3) | 3 (4.9) | 56 (91.8) | 0 (0) |

dissatisfaction were in the overall operative experiences; the majority (>85%) rating case volume, complexity, and variety as dissatisfactory.

Exposure to the surgical aspects of various subspecialties was also generally rated poor, as shown in Table 3. Many respondents stated that they had insufficient exposure to phacoemulsification; 75.4% never did a single phacoemulsification surgery and collectively 93.4% did less than 10 phacoemulsification surgeries during their residency. Glaucoma surgery had very low numbers as well; fifty five (90.2%) never did a single trabeculectomy procedure. The retina share was not good as well, 44 (72.1%) never been exposed to or assisted retina surgery, only 4.9% were reported being comfortable doing core vitrectomy. Refractive surgery wasn't different from other areas of training as only 19.7% were comfortable doing photorefractive keratectomy but not LASIK.

There was some variation in actual self-reported surgical volumes for various procedures within and between training programs. Table 4 shows the self-reported confidence of respondents in achieving competency in various ICO learning objectives. In the area of cataract/refraction training, most dependents felt they lacked training in glasses prescription only (19.7%) were able to do it comfortably, performing phacoemulsification (1.6%), contact lens prescription and refractive surgery (19.7%), and corneal surgery (6.6%). However, the number for extra-capsular cataract extraction was satisfactory as 73.8% were very confident in performing the procedure.

Oculoplastics share was low like the other disciplines, as areas of weakness included treatment of orbital trauma (77%), lacrimal surgery procedures (93.4%) and enucleation (82.2%). Within the realm of pediatric ophthalmology, most

respondents felt comfortable performing pediatric clinical assessments (73.8%); however, only (29.5%) were able to perform strabismus surgery and only 3.3% of respondents felt comfortable managing children with retinopathy of prematurity. None of the respondents felt comfortable prescribing low-vision rehabilitative therapies.

Hidden curriculum areas of teaching during residency were not evaluated in this research, as none of the programs added it as part of the curriculum. These include ethics, professionalism, and relationships with referring doctors and allied health professionals. Administrative issues such as staffing, practice models and management, and information technology were not uniformly addressed across all programs as well.

Respondents were asked a separate subset of questions assessing the adequacy of residency programs in preparing them for the Jordanian ophthalmology board licensing examination and for entering clinical practice. Only 14 candidates (23%) successfully passed the Jordanian board examination in their first attempt. On the other hand, 47 candidates (77%) felt that their residency program had some defects preparing them adequately for the exam (Table 5). Most candidates voted for many factors to blame in the residency program to cause the problem, such as the absence of a protected study time before the examination (96.7%), lack of good teaching sections and lack of review sections with a staff member.

Most respondents did experience some negative factors which affected their performance on the Jordanian board examination. More than 95% of candidates felt that ongoing clinical and call duties interfered with their performance. Inadequate clinical exposure during residency and lack of case variety took 59% and lastly inadequate teaching methods had 75.4%.

Table 3 Self-reported surgical volume experienced during residency training (n=61)

| Questions | Response | | n (%) |
|--|-----------------------------------|---------------------|-------|
| | Extracapsular cataract extraction | phacoemulsification | |
| How many cataract surgeries have you performed upon completion of your residency training? | | | |
| No cases done (0) | 10 (16.4) | 46 (75.4) | |
| 1-10 | 16 (26.3) | 11 (18.0) | |
| 11-20 | 7 (11.4) | 1 (1.6) | |
| 21-30 | 6 (9.8) | 2 (3.3) | |
| 31-50 | 9 (14.8) | 1 (1.6) | |
| 51-70 | 2 (3.3) | 0 (0) | |
| 70-100 | 5 (8.2) | 0 (0) | |
| >100 | 6 (9.8) | 0 (0) | |
| How many trabeculectomy surgeries have you performed during your residency training? | | | |
| No cases done (0) | 55 (90.2) | | |
| 1-5 | 6 (9.8) | | |
| >5 | 0 (0) | | |
| How many strabismus surgeries have you performed after during your residency training? | | | |
| No cases done (0) | 6 (9.8) | | |
| 1-5 | 19 (31.2) | | |
| 6-10 | 15 (24.6) | | |
| 10-20 | 14 (23) | | |
| 21-30 | 3 (4.9) | | |
| 31-40 | 1 (1.6) | | |
| >40 | 3 (4.9) | | |
| How many vitrectomy surgeries have you assisted during your residency training? | | | |
| No cases done (0) | 44 (72.1) | | |
| 1-5 | 12 (19.7) | | |
| 6-10 | 2 (3.3) | | |
| More than 10 | 3 (4.9) | | |

DISCUSSION

There has been no formal evaluation of the Jordanian residency programs since its creation in 1982 [1]. The ICO document on residency education clearly outlines the basic requisite clinical competencies for the ophthalmology resident. It serves as an excellent reference standard for administrators, educators, and certifying bodies to follow in the creation and modification of postgraduate ophthalmology education curricula [6].

In the present study, we evaluated resident's self-reported satisfaction and competency in achieving several key objectives outlined by the ICO. The study aimed to identify areas of deficiency in current Jordanian ophthalmology residency programs. Overall, Jordanian residents conveyed a low level of satisfaction with their training programs in most of the competencies outlined by the ICO.

It is advisable that in the future Jordanian board examination committee put forward strict numbers of all eye operations to be done by each resident before applying for the board exam. Many candidates asked for a logbook, which is not available

at the current time in all the Jordanian ophthalmology residency programs. Accreditation rules by the Jordanian Board committee should be reevaluated and redeveloped to become comparable to those of international boards, such as the royal college of ophthalmologists of London, or American academy standards [7]. Over 70% of Jordanian programs don't give residents an adequate opportunity to be exposed to the new modalities of surgical training; most programs lack training in phacoemulsification, retinal, or refractive surgeries as shown above. This might be attributed to many factors. Firstly, lack of surgery simulator training programs in the Jordanian facilities. It has been proven that Residents who trained on phacoemulsification using the simulator had shorter phaco times, lower percentage powers, and a shorter learning curve, especially in the first 50 cases, despite insignificant difference in intraoperative complications [8-11]. Secondly, residents are not attached to a teaching hospital in their entire residency period, as many of them are forced to work in peripheral hospitals in their second and third year. This trend is practiced in military and

Table 4 Self-reported competency in achieving various ICO learning objectives upon graduating from residency (n=61) n (%)

| Competency | Yes | No | Unsure |
|---|-----------|-----------|-----------|
| Cataracts/refraction | | | |
| I feel comfortable prescribing glasses | 12 (19.7) | 34 (55.7) | 15 (24.6) |
| I feel comfortable performing phacoemulsification | 1 (1.6) | 57 (93.5) | 3 (4.9) |
| I feel comfortable performing extracapsular cataract extraction | 45 (73.8) | 6 (9.8) | 10 (16.4) |
| I feel comfortable implanting toric intraocular lenses | 0 (0) | 61 (100) | 0 (0) |
| I feel comfortable performing refractive surgery | 12 (19.7) | 43 (70.5) | 6 (9.8) |
| I feel comfortable performing corneal surgery | 4 (6.6) | 55 (90.2) | 2 (3.2) |
| Glaucoma | | | |
| I feel comfortable performing glaucoma Lasers ALT/SLT | 1 (1.6) | 60 (98.4) | 0 (0) |
| I feel comfortable managing complications of glaucoma surgery | 3 (4.9) | 55 (90.2) | 3(4.9) |
| Retina | | | |
| I feel comfortable performing posterior segment examinations (including scleral depression) | 8 (13.1) | 26 (42.6) | 27 (44.3) |
| I can perform vitreoretinal surgical procedures | 0 (0) | 58 (95.1) | 3 (4.9) |
| Oculoplasty | | | |
| I can treat eyelid trauma | 34 (55.7) | 18 (29.5) | 9 (14.8) |
| I can treat orbital trauma | 0 (0) | 47 (77) | 14 (23) |
| I can perform lid surgical procedures | 2 (3.1) | 44 (72.1) | 15 (24.6) |
| I can perform lacrimal surgical procedures | 0 (0) | 57 (93.4) | 4 (6.6) |
| I can perform enucleation | 4 (6.6) | 52 (82.2) | 5 (8.2) |
| I can excise conjunctival tumours | 51 (83.6) | 8 (13.1) | 2 (3.3) |
| Pediatrics ophthalmology | | | |
| I feel comfortable performing pediatric clinical assessments | 45 (73.8) | 13 (21.3) | 3 (4.9) |
| I feel comfortable managing children with strabismus | 30 (49.1) | 23 (37.7) | 8 (13.1) |
| I feel comfortable diagnosing children with retinopathy of prematurity | 2 (3.3) | 43 (70.5) | 16 (26.2) |
| I feel comfortable performing strabismus surgery | 18 (29.5) | 31(50.8) | 12(19.7) |
| Others | | | |
| I can prescribe low-vision rehabilitative therapies and optical devices | 0 (0) | 57 (93.4) | 4 (6.6) |

governmental hospitals but not in universities. This great disturbance in the teaching system lowers the quality of training in military and governmental hospitals. As these peripheral hospitals lack a lot of the equipment's and adequate trained personnel's to teach residents. Finally, the high number of residents being accepted per program, which happens in governmental and military hospitals, lowers the surgical load and learning opportunities for many residents. The tremendous increase in the number of residents is related to the high service demand in the public sector. However, this demand is compensated by an increase in the number of residents accepted each year rather than an increase in professionally trained ophthalmologists. The shortage in well trained ophthalmologists in developing countries was pointed out by some studies^[12]. In the present study, there was a mean of 10.8±6.1 residents accepted per-program, while there were only 6.5±3.2 specialists working in the department. Making a specialist to resident ratio of 0.6 ±0.52, this ratio is low indeed. In this context, to improve operative load per residents, there must be some restriction on the numbers of residents accepted in the training posts per program. On the other hand, the importance of learning extra-capsular cataract extraction technique is undeniable, since it is the

procedure of last resort for very hard cataracts and it still remains the only option for cataract removal in poor and developing countries ^[13-15]. Today, phacoemulsification with ultrasound represents the gold standard in cataract surgery^[16]. In most countries extracapsular cataract extraction has been substituted with phacoemulsifications for having short rehabilitation time, less post-operative astigmatism, and the lower incidence of post-operative ptosis ^[17,18]. To improve the quality of our training programs, we need to adopt the guidelines put forward by programs reporting success in their experiences. Such as the Canadian, United States standards, United kingdom, or even Iranian standards^[4,19-23]. Collaborative teaching methods, has been proposed by some candidates to improve the overall quality of residency training in Jordanian hospitals. Many demanded an active involvement of university staff members to lead the educational process in governmental and military hospitals. This proposal came as a consequence to the low satisfaction in the number of Journal clubs, lectures and seminars provided by their hospitals. Recently, some major public hospitals are adopting the idea, as many universities provide well qualified professionals to improve the teaching and service quality in these hospitals. A great example is prince

Table 5 Graduates' responses to questions about preparedness for Jordanian board licensing examination (n=61) n (%)

| Questions | Response |
|---|-----------|
| How many times you applied for the Jordanian board exam? | |
| 1 | 14 (23) |
| >1 | 47 (77) |
| During your training, do you feel you were given adequate and feedback in the following setting(s)? | |
| Clinic/outpatient | 34 (55.7) |
| Operating room | 24 (39.3) |
| Opportunity to discuss progress with Program Director | 23 (37.7) |
| During your last year of residency, what was your on-call frequency per month? | |
| 1:2 | 0 (0) |
| 1:3 | 0 (0) |
| 1:4 | 3 (4.9) |
| 1:5 | 15 (24.5) |
| 1:7 | 19 (31.1) |
| 1:8 | 24 (39.3) |
| No on-calls | 0 (0) |
| Did your program have protected study time prior to your Jordanian board exam? | |
| No | 59 (96.7) |
| Yes, but too little | 2 (3.3) |
| Yes, just about right | 0 (0) |
| Yes, too much time | 0 (0) |
| Did you feel your training program prepared you to perform well on the Jordanian board exam? | |
| Yes | 9 (14.7) |
| No | 52 (85.3) |
| What methods did you use to prepare for the Jordanian board exams? Check all that apply | |
| Individual study | 61 (100) |
| Review sessions with staff | 0 (0) |
| Review sessions with peers | 2 (3.3) |
| Simulated exams | 0 (0) |
| Review course offered by the residency program | 0 (0) |
| Other review course | 0 (0) |
| Did any factors negatively affect your performance on the Jordanian board exam? Select all that apply | |
| Nothing negatively affected my performance | 2 (3.3) |
| Continuing clinic duties while studying | 59 (96.7) |
| Continuing call duties while studying | 58 (95.1) |
| Inadequate clinical exposure during residency | 36 (59.0) |
| Inadequate teaching during residency | 46 (75.4) |

Hamza hospital in the capital city of Amman. The private sector soon recognized the revolutionary idea, as many well trained doctors are willing to give help in these big institutions.

Another way to address the problems of residency programs in Jordan is to increase collaboration with regional or international programs. It has been documented in literature since 1988; that young physicians achieved greater surgical maturity by observing the practice of surgery in countries in addition to their own [24]. Collaboration with other international programs helps the resident in achieving various clinical and surgical skills, thus improving the overall rank of the residency program [25]. Residents should be encouraged to do part of their training program abroad in well-equipped hospitals with experienced teachers in various parts of

Europe and United states. This interaction will improve and positively impact the quality of ophthalmology practice in Jordan. In addition, it is an important leverage for the quality of doctors practicing in Jordan.

Jordan has been a victim for many neighbors' political conflicts; the most recent is the ongoing Syrian civil war. Many of Syrian citizens are fleeing from the heat of war to ask for a shelter in Jordan. This in turn added a considerable burden on public hospital services, forcing the government to hire residents not to learn but to serve the rapidly growing needy population. Facing these challenges, there should be some sharing of the great responsibility held by Jordan. By publishing this article we hope to increase the international awareness of the problem, and extend our hand to seek help from the international community.

In conclusion, strict standards for founding adequate residency training programs should be put forward by higher authorities. This will ensure an exalted level of ophthalmology training at both theoretical and practical levels. Once standards are put forward, all programs should be evaluated separately, pinpointing weakness areas, which can be tackled by taking further future action.

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