



Uvođenje nove edukacijske paradigme za bolju izobrazbu kardioloških specijalizanata

Adopting a New Training Paradigm to Bridge the Gaps in Cardiology Fellows Training

 Hasan Ali Farhan¹,
 Zainab Atiyah
Dakhil^{2*}

¹Scientific Council of
Cardiology, Iraqi Board for
Medical Specializations-
Baghdad Heart Centre,
Baghdad, Iraq

²Baghdad University/Al-
Kindy College of Medicine/
Department of Medicine,
Baghdad, Iraq

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SAŽETAK: Specijalizacija u interventnoj kardiologiji ubrzano napreduje, no programi kardiološke specijalizacije ne prate taj napredak u potpunosti. Edukacijsko ozračje koje zdravstvena institucija stvara za osobe koje podučava važna su odrednica za kvalitetu zdravstvenih usluga koje može ponuditi bolesnicima. Pokušali smo odrediti slabe točke u tradicionalnom programu specijalizacije iz kardiologije kroz učestalo skupljanje povratnih informacija od specijalizanata koji su ga pohađali. Nakon toga pokušali smo premostiti jaz u znanju i praksi uspostavljanjem nove edukacijske paradigme koja se sastojala u uvođenju pet dodatnih tečajeva u edukaciji specijalizanata na zadnjoj godini specijalizacije, koji su uključivali trening implantacije i programiranja kardioloških uređaja, osnove primjene holter sustava, osnove elektrofiziologije, pristup i zbrinjavanje prirođenih srčanih bolesti u odraslih te sudjelovanje u radu odjela za patološka kardiološka stanja u trudnoći. Nakon što su svi specijalizanti dovršili novi program treninga, ispunili su anketu kojom smo dobili povratnu informaciju o njihovoj razini zadovoljstva svakim tečajem, prednostima i nedostacima u svakom tečaju te njihovim prijedlozima glede budućih edukacijskih programa za poboljšanje kompetencije idućih generacija specijalizanata. Anketa je pokazala da je razina zadovoljstva bila najveća za tečajeve u odjelima za elektrofiziologiju i patološka kardiološka stanja u trudnoći, a najniža razina zadovoljstva bila je vezana za tečaj implantacije kardioloških uređaja, prije svega zbog ograničena praktičnog treninga. Ovaj je program nudio jednake mogućnosti i prilike svim kandidatima u poboljšanju znanja i povećanju sposobnosti kako bi poboljšali kompetencije, što će posljedično poboljšati i kardiovaskularnu njegu.

SUMMARY: Interventional cardiology specialty is progressing at a rapid pace, but the progress in cardiology fellowship programs does not parallel it fully. The educational and training environment provided by a healthcare facility to its trainees is a major determinant of the healthcare services it can provide to patients. Keeping that in mind, we tried to determine the fragile points in the traditional cardiology fellowship program by continuous precise feedback from fellows in training. We then tried to bridge the practice and teaching gaps by establishing a new training paradigm that implemented five courses in training of the final-year fellows, including training on device implantation, device programming and Holter basics, electrophysiology study basics, approaching and managing adult congenital heart disease, and cardio-maternal unit attendance. Once all fellows in training completed their new training program, they were surveyed for feedback regarding their satisfaction level with each course, privileges and educational pitfalls of each course, as well as their suggestions for future training programs for the next fellows to further improve competency. The survey found that the level of satisfaction was highest with electrophysiology and cardio-maternal unit training, while the lowest satisfaction level was reported for the device implantation course, mainly due to limited hands-on training. This program provides equal opportunities to all candidates in order to improve knowledge and upgrade skills to improve the competencies of this workforce nucleus which will subsequently impact cardiovascular care.

KLJUČNE RIJEČI: interventna kardiologija, specijalizacija, trening.

KEYWORDS: interventional cardiology, fellowship, training.

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***ADDRESS FOR CORRESPONDENCE:** Zainab Atiyah Dakhil, Baghdad University/Al-Kindy College of Medicine/ Department of Medicine, Baghdad, Iraq. / Phone: +9647505758405 / E-mail: stethoscope.med@gmail.com

ORCID: Hasan Ali Farhan, <https://orcid.org/0000-0002-6061-4966> • Zainab Atiyah Dakhil, <https://orcid.org/0000-0001-7102-522X>

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Uvod

Interventna kardiologija doživjela je skok u inovacijama te i dalje napreduje brzim tempom, pa se i kardiološki edukacijski programi također trebaju prilagođivati novim napredcima. Sposobnost mentora da poboljšavaju znanje i educiraju specijalizante određuje kvalitetu njege u zdravstvenim ustanovama.¹ U Iraku je program kardiološke uže specijalizacije uređen kao trogodišnji edukacijski program koji se može pohađati nakon završena četverogodišnjeg programa specijalizacije iz interne medicine. Glavni su izazovi u tradicionalnoj kardiološkoj edukaciji kako dati jednake mogućnosti svim specijalizantima (pogotovo u zemljama u razvoju zbog ograničenih sredstava) te kako zadovoljiti potrebe za kardiološkom njegom u zemlji, posebice nakon uspostavljanja novih kardioloških centara diljem zemlje, gdje svježje školovani kardiolozi moraju samostalno raditi. Proširenje treninga da bi se poboljšale kompetencije specijalizanata može biti vrlo skupo, osobito u zemljama u razvoju, s golemim učinkom na zdravstveni sustav.² Stoga je preoblikovanje cjelokupne kardiološke edukacije postalo ključno zbog ubrzanog proširenja ove specijalizacije.

Preoblikovanje kardiološke edukacije

Europsko kardiološko društvo (ESC; prema engl. *European Society of Cardiology*) prihvatilo je 2013. godine novi temeljni kurikulum ESC-a u općoj kardiologiji s većim usredotočenjem na koncept *heart* tima, izobrazbu usmjerenu na bolesnika, neinvazivno oslikavanje, šire uključivanje kardionkologije te uključivanje akutne kardiovaskularne njege.³ U 2015. godini *American College of Cardiology* (ACC) izdao je Temeljnu izjavu o izobrazbi u kardiologiji 4 (COCATS 4) koja je predstavila najnovije preporuke ACC-a za programe specijalizacije, što je prvi put uključivalo preporuke vezane za trening iz intenzivne kardiološke skrbi te trening iz multimodalnoga neinvazivnog kardiološkog oslikavanja.⁴ U SAD-u također postoje i etablirani specijalizacijski programi u preventivnoj kardiologiji koji mogu poslužiti kao uzori glede uvođenja kardiološke edukacije prema nezadovoljenim kadrovskim potrebama u ovoj širokoj specijalizaciji.⁵ Novouvedeni međunarodni kardiološke specijalizacije ne samo da uvode napretke u propisani sadržaj kurikula nego također uključuju i određene pristupe i bodovanja kojima se procjenjuje napredak kompetencija specijalizanata i prati učinkovitost njihove edukacije.⁶ Takvi bi nas napredci trebali potaknuti da uzmemo u obzir uvođenje promjena u kardiološku edukaciju te popunimo nedostatke u postojećim programima.

Kako bi stvorili dobro opremljenu generaciju liječnika, članovi Odbora za kardiologiju odlučili su otvoriti put specijalizantima premošćivanjem nedostataka u tradicionalnom programu specijalizacije iz kardiologije. S tom svrhom pokušali smo uvesti novi edukacijski model za kardiološke specijalizante te provesti procjenu razine njihova zadovoljstva tim modelom.

Izazovi

Tradicionalni programi kardiološke specijalizacije usredotočivali su se prije svega na uvježbavanje koronarne angiografije u prvoj godini specijalizacije te na perkutane koronarne intervencije u drugoj i trećoj godini. Od listopada 2017. do rujna

Background

Interventional cardiology has seen a leap in innovations and is still progressing at a rapid pace, so cardiology training programs should adopt accordingly. The ability of mentors to advance knowledge and educate trainees determines the quality of care in our healthcare facilities.¹ In Iraq, the cardiology fellowship subspecialty program is a 3-year training program that can be started after completing four-year fellowship training in internal medicine. The main challenges in traditional cardiology training are how to give equal opportunities for all fellows-in-training (FITs) (especially in developing countries in view of limited resources) and how to meet the needs of cardiovascular care, particularly after establishing new cardiac centers across the country where the newly-educated cardiologists will work independently. Extending training to improve FITs competency can be very costly, especially in developing countries, with a huge impact on the healthcare system.² Therefore, changing the landscape of cardiology training became crucial considering the rapid expansion of this specialty.

Reshaping cardiology training

In 2013, the European Society of Cardiology (ESC) adopted the new ESC Core Curriculum in general cardiology with more focus on concept of the Heart Team, patient-oriented training, non-invasive imaging, broader inclusion of cardio-oncology and new inclusion of acute cardiovascular care.³ In 2015, the American College of Cardiology (ACC) issued the Core Cardiology Training Statement 4 (COCATS 4) that represented the latest ACC curriculum recommendations for fellowship programs, which included for the first time recommendations regarding critical care cardiology training and multimodality non-invasive cardiovascular imaging training.⁴ Moreover, there are well-recognized fellowship training programs in preventive cardiology in US which can serve as role models regarding how to implement training in cardiology according to the unmet needs in this wide speciality.⁵ Recent international cardiology fellowship programs are not only advancing curricular requirements, but also include certain approaches and specific scores to assess the progress of FITs' competency and track their efficiency in training.⁶ Such forward steps should motivate us to reconsider changing the training program landscape to fill the training gaps in recent programs.

In order to create a well-equipped generation of physicians, decisionmakers in the Council of Cardiology decided to pave the way for FITs by bridging the gaps in the traditional cardiology fellowship program. With this aim in mind, we sought to implement a new training model for cardiology fellows in training and assess their satisfaction level with this model.

Challenges

Traditional cardiology fellowship programs focused primarily on training on diagnostic coronary angiography during the first year of fellowship and training on percutaneous coronary interventions during second- and third-year training. From October 2017 to September 2018, regular feedback was collected by trainers and mentors from adult cardiology FITs regarding their training. FITs highlighted gaps in device implantation, device programming and Holter basics, and

2018. mentori i voditelji redovito su od specijalizanata u kardiologiji prikupljali povratne informacije u vezi s njihovom edukacijom. Specijalizanti su u svojim odgovorima naglasili nedostatke u podučavanju implantacije kardioloških uređaja, programiranju uređaja i osnova korištenja holter sustavom te osnova elektrofiziologije (EP), a naveli su i teškoće u praksi pri zbrinjavanju određenih populacija kao što su prirodne bolesti srca u odraslih (ACHD) te trudnica s bolestima srca; mnoge od ovih sposobnosti podučavane su nasumično, pri čemu nisu svima pružene jednake mogućnosti, te bez primjerenih dobro organiziranih edukacijskih ciljeva.

Uvođenje promjena

U skladu s navedenim, između prosinca 2018. i listopada 2019. Znanstveni odbor za kardiologiju uveo je novu edukacijsku paradigmu za specijalizante treće (posljednje) godine. Ta je paradigma uključivala uvođenje pet dodatnih tečajeva:

- Implantacija kardioloških uređaja: specijalizanti su pohađali laboratorij za implantaciju kardioloških uređaja pet dana u tjednu tijekom pet uzastopnih tjedana,
- Osnove i postupci u kardiološkoj elektrofiziologiji: specijalizanti su pohađali EP laboratorij tri dana u tjednu te dnevnu bolnicu s nadležnim specijalistom iz elektrofiziologije jednom tjedno tijekom četiriju uzastopnih tjedana,
- Pristup ACHD-u i njegovo zbrinjavanje (uključujući sudjelovanje na odjelu za pedijatrijsku kardiologiju i odjelu za kardiokirurgiju) tijekom četiriju uzastopnih tjedana,
- Programiranje i interpretacija rezultata holtera: obilazak jedinice za holter s edukacijom tijekom četrnaest uzastopnih dana,
- Odjel za patološka kardiološka stanja u trudnoći: pohađanje edukacije na odjelu dva dana tjedno tijekom šest do osam uzastopnih tjedna; ovaj je tečaj uveden za drugu godinu specijalizacije, a oni koji ga nisu pohađali na drugoj godini pohađali su ga u trećoj.

Uveden je i rotirajući raspored koji je uključivao jednog specijalizanta tjedno za svaki od navedenih tečajeva. Nakon što su svi specijalizanti završili edukaciju, svi su ispunili anketu o svojem zadovoljstvu novim programom. Koristili smo se tiskanom anketom u pdf formatu koja je poslana preko društvenih mreža (*Viber* i *WhatsApp*) svim specijalizantima uključenima u istraživanje; anketa je sadržavala 11 odjeljaka s 28 pitanja o razini zadovoljstva pojedinim tečajevima, prednostima i nedostacima u svakom tečaju, te prijedlozima za buduće edukacijske programe za sljedeće generacije specijalizanata i poboljšanje njihovih kompetencija.

Rezultati

Dvanaest specijalizanata zadnje godine bilo je uključeno u model; u anketi su naveli vrlo visoku razinu zadovoljstva u edukaciji za EP i na odjelu za patološka kardiološka stanja u trudnoći, a najniža razina zadovoljstva navedena je za implantaciju kardioloških uređaja (vidjeti **sliku 1**). Raniji početak ovog programa, tj. uvođenje programa na drugoj godini umjesto na trećoj, predložilo je 33,3 % specijalizanata. Visoko radno opterećenje zbog programa iskusilo je 83,3 % kandidata, prije svega kao posljedicu tečajeva iz kardioloških uređaja, EP-a i patoloških kardioloških stanja u trudnoći. Glavni nedostatak tečaja iz kardioloških uređaja bio je izostanak praktičnog

electrophysiology study (EP) basics, in addition to reporting difficulties in real world practice in managing special populations like adults with congenital heart disease (ACHD) and pregnant patients with heart diseases; many of these skills were acquired haphazardly during training without equal opportunities given to all and with no proper well-organized training objectives.

Taking action

Accordingly, a new training paradigm for the final (3rd) year FITs was established by the Scientific Council of Cardiology from December 2018 to October 2019. This paradigm implemented five courses:

- Device implantation: FITs attended the device implantation lab 5 days per week for four consecutive weeks.
- Cardiac electrophysiology basics and procedures: FITs attended the EP lab 3 days per week and the outpatient clinic with supervising electrophysiology specialist once weekly for four consecutive weeks.
- Adult congenital heart disease (ACHD) approach and management (including attachment with both pediatric cardiology and cardiac surgery departments) for four consecutive weeks.
- Programming and Holter interpretation: attending Holter and programming units with focused training for 14 consecutive days.
- Cardio-Maternal Unit (CMU): attendance at the CMU two days per week for 6-8 consecutive weeks; this training was included during the second year of the fellowship, and those who had not attended course in the second year were trained during their third year.

A rotatory schedule was assigned to include one fellow each month for each particular course. After completing training of all fellows, all FITs were surveyed for their satisfaction levels with the new program. We used a printed survey in PDF format which was sent by social media (*Viber* and *WhatsApp*) to all recruited FITs; the survey contained 11 sections with 28 questions focusing on their satisfaction level with each course, privileges and educational pitfalls of each course, as well as suggestions for future training programs for the next fellows to further improve competency.

Results

Twelve final year FITs were engaged in the model; very high satisfaction was reported in EP and CMU training, while the lowest satisfaction level was reported with device implantation (see **Figure 1**). Starting part of this training program earlier, i.e. in the second year of the fellowship instead of the third year, was suggested by 33.3% of fellows. Heavy workload was reported by 83.3% of candidates mainly in device, EP, and CMU training. The main drawback of device training was the absence of hands-on training, which contradicted the course objectives despite the fact that FITs were trained for 5 days a week during the device implantation course. Duration of courses was requested to be longer for device training by 75% of FITs, while 50% of them felt that programming and CMU courses needed to be extended; 83.3% and 91.6% of candidates requested extending the duration of training in EP and ACHD courses, respectively. Future intensive training courses for

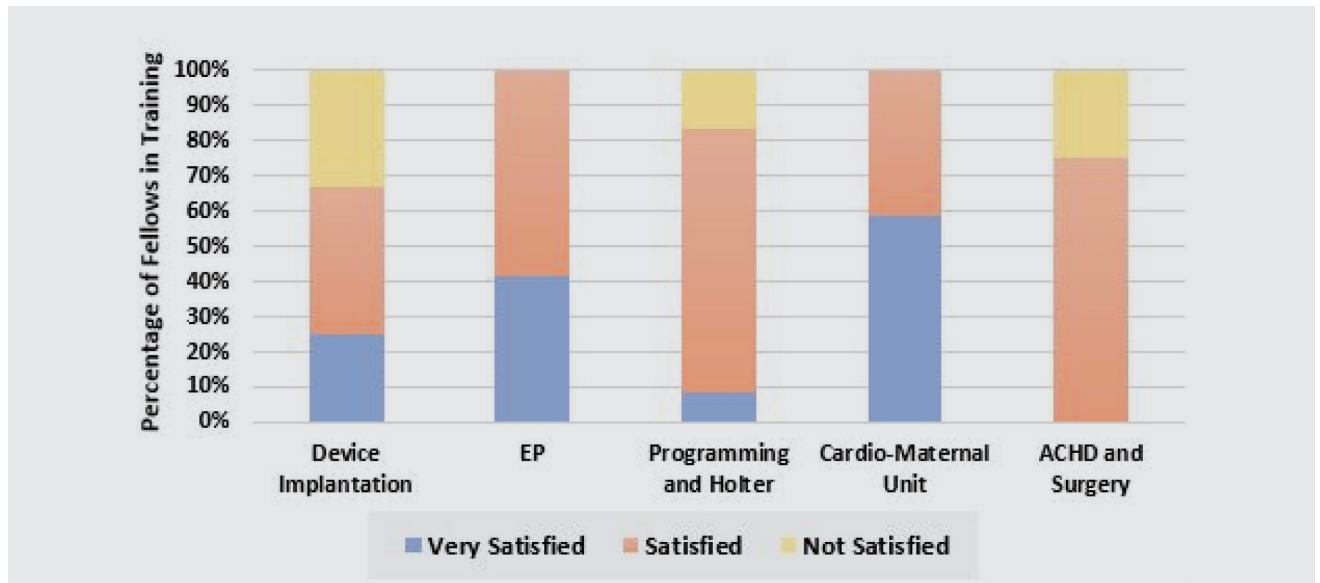


FIGURE 1. Fellows' satisfaction level with each training course.

EP = electrophysiology; ACHD = adult congenital heart disease

treninga, što je proturječilo ciljevima tečaja usprkos činjenici da su specijalizanti pohađali tečaj implantacije kardioloških uređaja pet dana u tjednu. Glede trajanja tečaja, 75 % specijalizanata tražilo je produljenje tečaja implantacije kardioloških uređaja, a 50 % specijalizanata smatralo je da se tečajevi programiranja uređaja i kardiološke patologije u trudnoći također trebaju produljiti; 83,3% i 91,6% kandidata tražilo je produljenje treninga iz EP-a i ACHD-a. Uvođenje budućih intenzivnih treninga za kardiološko oslikavanje predložilo je 41,6 % specijalizanata, dok je 33,3 % ispitanih tražilo tečaj posvećen transezofagealnoj ehokardiografiji. Polovica je specijalizanata smatrala da treba bolje upoznati postupak predoperativne kardiovaskularne procjene te je predloženo da se to u većoj mjeri uključi u kurikule budućih tečaja. Specijalizanti su smatrali da su sposobni samostalno (bez nadzora) provoditi primarnu perkutanu koronarnu intervenciju u 91,6 % anketnih odgovora, ali samo 41,6 % ispitanika smatralo je da su sposobni samostalno provesti implantaciju trajnog elektrostimulatora, a 33,3 % specijalizanata smatralo je da mogu samostalno voditi pronalaženje greške ili smetnje u radu implantiranog uređaja. Svi su specijalizanti smatrali da program ima nedostatke u edukaciji, svi su smatrali da su privilegirani što su sudjelovali u programu te da se program treba nastaviti primjenjivati za buduće specijalizante.

Usmjerenja u budućnosti

Suradnja među svim kardiološkim supspecijalizacijama te uvođenje takve suradnje u edukacijske programe može dovesti ne samo do poboljšanja programa interventne kardiologije nego može biti i začetak drugih visoko specijaliziranih kardioloških usluga, kao što je već bilo učinjeno u drugim zemljama.^{7,8} Irak sada kreće prema popunjavanju nedostataka u programu kardiologije odraslih te uvođenju visoko specijaliziranih programa kao što je tečaj elektrofiziologije i program supspecijalizacije za periferne vaskularne intervencije, kako

cardiac imaging were proposed by 41.6% of FITs, while courses dedicated to transesophageal echocardiogram training were requested by 33.3%. Half of FITs felt they needed more familiarity with preoperative cardiovascular assessment and it was suggested to be included more extensively in future training curricula. FITs thought they were able to work independently (under no supervision) in primary PCI in 91.6% of responses, while only 41.6% believed they were capable of performing independent permanent pacemaker implantation, and 33.3% believed they could independently manage device troubleshooting. All fellows thought that this program bridged practice gaps, all of them believed that they were privileged for being recruited, and all of them stated the program should continue for future fellows in training.

Future directions

Collaboration between all cardiac subspecialties and implementing this collaboration in educational programs can lead not only to improved interventional cardiology programs but can also plant the first seeds of other highly specialized cardiac services as has been done in other countries.^{7,8} Iraq is now heading towards filling practice gaps in the adult cardiology program along with starting highly specialized programs like an electrophysiology training program and peripheral vascular intervention fellowship program in order to provide highly demanding cardiac services nationwide.

Conclusion

Asking for continuous feedback from trainees and collaboration between mentors, trainers, and decisionmakers can help in addressing barriers that preclude standard training and bridging the gaps in traditional fellowship programs, which will contribute to preparing the workforce nucleus that can confront the challenges anticipated in improving cardiovas-

bi omogućio provođenje izrazito zahtjevnih kardioloških usluga u cijeloj zemlji.

Zaključak

Učestalo primanje povratnih informacija od specijalizanata i suradnja između mentora, voditelja i nadređenih može pomoći u odstranjivanju prepreka koje onemogućuju standardni trening te u premošćivanju nedostataka tradicionalnih programa specijalizacije, što će pridonijeti stvaranju djelatnika koji se mogu nositi s izazovima koje očekujemo u postupku poboljšanja kardiovaskularne skrbi i prakse te posljedičnim poboljšanjem ishoda.

cular care and practice with subsequent optimization of patient outcomes.

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