

# A survey for the evaluation of the training period of cardiology specialists in Turkey

## Türkiye kardiyoloji uzmanlık eğitimi dönemi değerlendirme anketi

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### ABSTRACT

**Objective:** To evaluate postgraduate training period, social life and problems of cardiology residents in Turkey by using a questionnaire form and to compare with the core curriculum of European Society of Cardiology for general cardiology.

**Methods:** Overall, 529 residents of cardiology ages in range of 24-35 years (mean age: 26.5±2.0 years, 81.4% male) participated as volunteers in this cross-sectional survey study. An 86-item questionnaire form was used to evaluate the education process, capacity of knowledge and skill and social effectiveness level of participants. The questionnaire were composed both closed- and open-ended questions. The questionnaire form was filled in with the face-to-face communication method. The data of survey were compared with the core curriculum of European Society of Cardiology for general cardiology training period. Chi-square or Fischer exact test was used for statistical analysis.

**Results:** The participants were working in various university hospitals (70.3%) and training-research (state) hospitals in 31 different provinces in Turkey (40.8% in Marmara region). They visited 40±10 outpatients and 10±5 hospitalized pts daily in the clinics. The 3-5 residents worked at the clinic on night shifts and mostly (89%) 8 or more night shifts per month were held in their first training years. During first three-years of training 76% of residents have performed echocardiography, 40.8%-transesophageal echocardiography and 10%-intraoperative echocardiography. The 84.3% of them evaluated exercise tests, 76.4%-Holter electrocardiography and 53.3%-tilt-table tests. The rate of residents working in coronary angiography laboratories was 54.3%. The 53.7% of residents performed coronary angiography and 64%-only in the 4th year of their training. The number of coronary angiography performance was under expected when compared with European Society of Cardiology curriculum. The 18.5% of residents were participated as assistant researcher in an international multi-center study and only 10% had an article published in national journals (4.3% published in Science Citation Index). The 30.6% considered the cardiology training period in their centers to be insufficient, whereas 37.4% found it partially sufficient and 31.9% sufficient. Only 32.9% of participants could dedicate time for social activities.

**Conclusion:** According to the referred core curriculum of ESC for general cardiology the training of cardiology residents in non-invasive applications is adequate however coronary angiography applications are slightly insufficient in Turkey. In addition, the number of publications per capita is quiet low. (*Anadolu Kardiyol Derg 2011; 11: 661-5*)

**Key words:** Cardiology, training, survey

### ÖZET

**Amaç:** Türkiye'deki kardiyoloji asistanlarının uzmanlık eğitim sürecini, sosyal yaşantılarını, sorunlarını bir anket formu aracılığıyla değerlendirmek ve Avrupa Kardiyoloji Cemiyetinin genel kardiyoloji müfredatıyla karşılaştırmak.

**Yöntemler:** Bu enine-kesitsel anket çalışmasına yaş aralığı 24-35 yıl olan 529 kardiyoloji asistanı (yaş ortalaması: 26.5±2 yıl, %81.4'ü erkek) gönüllü olarak katıldı. Katılımcıların eğitim süreçleri, bilgi kapasitesi, beceri ve sosyal etkinlik düzeylerini değerlendirmek için 86 sorudan oluşan bir anket formu kullanıldı. Anket hem kapalı, hem de açık uçlu sorulardan oluşmaktaydı. Anket formu yüz yüze görüşülerek dolduruldu. Anket verileri, Avrupa Kardiyoloji Cemiyetinin genel kardiyoloji eğitim sürecine ilişkin müfredatıyla karşılaştırıldı. Kategorik değişkenlerin karşılaştırılması için Ki-kare veya "Fisher exact" testi kullanıldı. P değerinin <0.05 düzeyi anlamlı olarak kabul edildi.

**Bulgular:** Katılımcılar Türkiye'de 31 farklı ildeki çeşitli üniversite (%70.3) ve eğitim-araştırma hastanelerinde çalışmaktadır (%40.8'i Marmara bölgesinde). Kliniklerinde günlük 40±10 poliklinik ve 10±5 hastanede yatan hastayı izlemektedirler. Klinikte gece nöbetinde 3 ile 5 asistan görev almakta ve çoğunlukla (%89) ilk eğitim yılında 8 ve üzeri nöbet tutulmaktadır. İlk üç yıllık asistanlık eğitimlerinde 76'sı ekokardiyografi, %40.8'i transözofageal ekokardiyografi ve %10'u intraoperatif ekokardiyografi yapmıştır. %84.3'ü efor testi, %76.4'ü Holter elektrokardiyografi testi ve

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%53.3'ü tilt-masa testi değerlendirmiştir. Koroner anjiyografi laboratuvarlarında çalışan asistanların oranı %54.3'tü. Asistanların %64'ü eğitimlerinin 4. yılında olmak üzere, %53.7'si koroner anjiyografi yapmıştır. Uygulamalar bazında Avrupa Kardiyoloji Cemiyeti'nin müfredatıyla karşılaştırıldığında koroner anjiyografi sayılarının beklenenin altında olduğu görülmektedir. Asistanların %18.5'i uluslararası çok merkezli çalışmada yardımcı araştırmacı olarak görev almışken sadece %10'unun ulusal dergilerde, %4.3'ünün Science Citation Index dergide yayını bulunmaktadır. Merkezlerindeki kardiyoloji eğitimi sürecini %30.6'sı yetersiz, %37.4'ü kısmen yeterli ve %31.9'u ise yeterli bulmaktadır. Sosyal aktivitelere ancak %32.9'u zaman ayırabilmektedir.

**Sonuç:** Avrupa Kardiyoloji Cemiyeti'nin genel kardiyoloji müfredatının önerileri doğrultusunda, Türkiye'de kardiyoloji asistanlarının eğitimi sürecine girişimsel uygulamaların sayısı yeterli iken, koroner anjiyografi sayıları biraz yetersiz kalmaktadır. Kişi başına düşen yayın sayısı ise oldukça düşük olmaktadır. (*Anadolu Kardiyol Derg 2011; 11: 661-5*)

**Anahtar kelimeler:** Kardiyoloji, uzmanlık eğitimi, anket

## Introduction

It is a well known fact that following recent improvements in medical world is getting harder every day since these improvements are accumulating at a tremendous rate with the help of information technologies (1). This situation makes it necessary for many doctors to take specialist education. Specialist education is a long and exhaustive process, which requires serious responsibility (2). 'The student of expertise' or 'resident doctor' is the name given to the doctors who undergo training, research and practice process to be a specialist in the related field. As it is the case in many countries, there are certain difficulties and problems in training specialists in Turkey (3). It is a commonly shared belief that the working conditions are very difficult for postgraduate medical training. In Europe, a cardiologist needs to have a combined six years of residency or post-MD training. Three of those years need to be in cardiology and the other three in internal medicine, emergency medicine, general surgery or any such combination with at least two of the years in internal medicine. So the expectations are rising and the level of responsibility is increasing (3-5).

We have no specific date that has dealt with the cardiology residents in particular in Turkey. The purpose of the study was to determine the views, expectations and objectives of residency in cardiology through a cross sectional survey. The data also compared with the core curriculum European Society of Cardiology (ESC) for general cardiology. In this curriculum, ESC has recommended which skills and attitudes and in what level should be possessed by general cardiologist in Europe (6).

## Methods

### Study design and population

This cross-sectional study was carried out between January 2009 and March 2010. All cardiology residents (742) in Turkey were included in study. A questionnaire was prepared consisting of 86 questions. The ethical approval of the Ege University Ethical Committee for the study was obtained.

The questionnaire forms were answered by 529 of 742 (72%) cardiology residents working in 38 university hospitals and 13 training-research (state) hospitals in 31 different cities in Turkey. Before the study was started necessary permission was

obtained from the head of departments and chiefs of the relevant departments. The clinics and residents were excluded in which the head of departments and chiefs not to allow participation. An informed consent was obtained from all residents included in the study. Identity information wasn't required while the forms were being filled. The questionnaire were composed both closed-and open-ended questions. Attendance of residents to the study was determined according to informed consent. The questionnaire form was filled in with the face-to-face communication method. All information related to the filled forms was kept confidential.

### Questionnaire form

A survey with 86 questions with multiple choices was prepared to evaluate the cardiology residents' education process, capacity of knowledge and skill and their level of social effectiveness in Turkey. The questionnaire form included night shifts, clinical skills, earning money, working period, working conditions, congress attendance, social life, trainers, patient care etc.

### Protocol of the study

All 86 questions in questionnaire were evaluated three times by two cardiologists. The data were grouped according to closed and open-ended answers. If one or more question was not answered the residents' survey form were excluded.

### Statistical analysis

The statistics of the study were carried out in the Biostatistics Department of Ege University by using SPSS 18 (SPSS Inc., Chicago, IL, USA) statistical program. All values were expressed as mean±SD or percentage values. Chi-square or Fischer exact test was used to compare categorical variables. The data were also compared with the core curriculum ESC for general cardiology. The questionnaire results also were compared between university and state hospitals. A p value was found significant at <0.05 level.

## Results

Our study includes almost all of the institutions that provide specialist cardiology training and is carried out by meeting the residents face to face.

### Demographic characteristics

The 529 residents of cardiology working in various university (372, 70.3%) and state (157, 29.7%) hospitals in 31 different provinces of Turkey in range of 24-35 years (mean age was 26.5±2 years, 81.4% male) attended to questionnaire as volunteers. The 34.6% of the participants' first choices were cardiology for post-graduate training. The 372 (70.3%) of the physicians were working in university hospitals and 40.8% of them were working in the Marmara region of Turkey.

The 45.8% of the centers had 21-60 bed capacity. Approximately in 50% of them 10 coronary angiographies (CA) per a day were performed. The rate of residents working in CA laboratories was 54.3%. The 53.7% of the residents performed coronary angiography and 64%-only in the 4<sup>th</sup> year of their training.

The ratios of academic personnel of 31 centers were as the following: professor (more than one) 83.6%, associate professor 80.9%, assistant professor 97% and specialists 72.8%.

### Patient monitoring rate

The mean number of outpatients was 40±10, whereas the mean number of the patients for each resident in their clinic was 10±5. While the mean number of residents who worked on the night shifts in all centers and participated in study was 3-5, the majority of them started the process with eight or more night shifts per a month. The rate of the residents who worked with 14 and more night shifts was 34.8% and 95.7% of them were working in university hospitals. Approximately, 1/3 of all residents spent 2 days in the clinic apart from the normal working hours.

### Laboratory practices participation rates

During the first three-years of cardiology assistant training, 76% of residents performed echocardiography (echo): 16.6% did one echo in 10 days, 20.8%-11 in 20 days and 18.8% of them did 21 in 30 days; 40.8% of them performed transesophageal echo (TEE) and 10 % of them performed intraoperative echo.

Besides, 84.3% of the residents performed exercise tests, 76.4% of them performed Holter electrocardiography (ECG) and 53.3% performed tilt- table assessment. The rate of the residents who implemented cardiac pacemaker was 10.6% (Table 1).

The total rate of the ones who did CA was 53.7% in our population study. The rate of CA was higher in university hospitals than state hospitals (36.8% vs. 16.8% respectively). The 19.1% of the residents working in university hospitals and 34.4% working in state hospitals did interventional operations [percutaneous transluminal angioplasty (PTCA)+STENT] under the management of experts in laboratory ( $p<0.001$ ). The number of PTCA+STENT done by the residents was significantly higher in state hospitals ( $p<0.001$ ). The 56.7% of residents working in university hospitals and 75.2% of the ones working in training-research hospitals performed 24-hour PTCA+STENT operations in their working centers.

Electrophysiology study was done in 66.4% of the clinics and was performed one to five times in a month in 34.8 of them.

### The rates of participation in scientific research and scientific publication

Only 48.4% of residents plan an academic career in future. The 18.5% of them worked as assistant researchers at an international multi-center study. The 10% had publications (52.8% case report) as first names in international journals (10%) which 4.3% were Science Citation Index (SCI) publications. The 67.7% of residents working in university hospitals attended national cardiology congresses and 9.9% of them have just attended international cardiology congresses. These rates were 75.8% and 14.6% respectively for state hospitals (Table 2). Only 44.8% of participants had enough time to focus in clinical research. The 30.6% considered cardiology training period in their centers to be insufficient, whereas 37.4% found it partially sufficient and 31.9% sufficient.

### Evaluating the professional efficiency and social effectiveness

While the residents were expressing their preferences, 39.1% of them put the necessity of professional efficiency to the top. It was observed that 81.9% of them thought to choose the cardiology residency once more if they were asked to re-enter the Medical Specialization Exam. In addition, 54.3% of participants indicated that they would choose the same hospital again if they were given the chance to change their places. The 30.6% of residents believed the cardiology training period of their centers insufficient, whereas 37.4% of them found it partially sufficient and 31.9% of them found it sufficient. The 88.5% of residents spent 12 months in internal medical department and 51.8% found this duration very long. However, only 32.9 of them had enough time for social activities.

### Discussion

This study is the first to evaluate the post-graduate specialist training period in cardiology, social life and problems of cardiology residents in Turkey by using a questionnaire form and comparing with the core curriculum of ESC for general cardiology. According to core curriculum of ESC for general cardiology the training in non-invasive applications was adequate. However, coronary angiography applications were slightly insufficient.

This study has been realized by both talking to the subjects and having them answer the research questions. In this kind of studies it is rather difficult to convince people to participate in the answering process and hence to get reliable answers from them. Furthermore, many questionnaires are delivered by post in the medical world. The rate of getting feedback in the studies in which mails are used is very low (1, 4, 5). However, this study was carried out by meeting the resident face to face and includ-

**Table 1. Distribution of laboratory practices rates of participants and ESC's recommendations for training in general cardiology**

Technique	University hospital, n/%	State hospital, n/%	Total, n/%	ESC's recommendation, n
Exercise test	308/58.2	138/26	446/84.3	300
Holter ECG	284/53.6	120/22.6	404/76.4	200
Tilt-table test	235/44.4	47/8.9	282/53.3	100
Echocardiography	268/50.6	134/25.3	402/76	350
TEE	148/27.9	68/12.8	216/40.8	50
Coronary angiography	195/36.8	89/16.8	284/53.7	300
Interventional therapy (PTCA±Stent)	195/36.5	89/16.8	125/23.6	50
Pacemaker	42/7.9	14/2.6	56/10.6	50

Data are presented as numbers/percentages  
ECG - electrocardiography, ESC - European Society of Cardiology, TEE - transesophageal echocardiography

**Table 2. Comparison of the rates of scientific research and publications between university and state hospitals**

Scientific research and publications	University hospital, n/%	State hospital, n/%	p*
International study	81/21.8	17/10.8	0.03
The first name published in national journals	38/10.2	15/9.6	0.8
The first name published in SCI	15/4	8/5.1	0.5
The first name presentation in national congresses	24/6.5	10/6.4	0.9
Participation in national congresses	252/67.7	119/75.8	0.06
Participation in international congresses	37/9.9	23/14.6	0.1

Data are presented as numbers/percentages  
\* Fischer exact test  
SCI - science citation index

ed almost all of the institutions which give specialist cardiology training.

During the training period, just 32.9% of residents had enough time to join in social activities such as going to the cinema, theatre, football match, doing excursions or playing bowling etc. because of the intensity of workload in cardiology departments.

Although the number of training in invasive and non-invasive applications was parallel to core curriculum of ESC, 1/3 of participants considered that they had sufficient training. This contradiction might be owing to the fact that the given work (the number of the night shifts, patient follow-ups, taking sheath, etc) was not seen as training but seen as redundant workload in the first years of the assistantship. Whereas 89% of the residents

started working with 8 and above night shifts per a month, 34.8% of them started working with 14 and above night-shifts. The 95.7% of residents who started working with 14 and above night-shifts generally were working at university hospitals. Therefore, the residents who worked at university hospitals had more workload than the others. Most of the participants were working in university hospitals and in the Marmara Region. İstanbul, which holds the 1/5 of Turkey's population, is located in this region and the number of university and training hospitals is more than other regions, which explains the density of assistant population there.

The 78% of the cardiology residents got into one of their first three preferences according to their exam results and 81.9% of them consider preferring cardiology once more if they would re-enter the exam. Each stage of specialization (the decision to begin, the training process, the goals after being specialists) is in close relationship with the economy (7-9). A similar result was found in the survey of Wheatley et al. (10) which was carried out on 92 cardiothoracic surgery assistants and the results showed that only 87.2% of the participants preferred to be freelance doctors. Just 12.8% of them made a career planning.

Despite the current economical difficulties, while making a preference, expertise and career gains were given the first two priorities and financial gains remained at the background, which is one of the interesting findings of this study. Only 12.8% of the graduated doctors planned to go on their academic career.

It was a remarkable point that before TUS (Medical Specialization Exam) the success rate in foreign language exam and the competence of English were known as 100%, however, the number of international publications was low (43%). It might stem from the fact that English was not known sufficiently or the doctors were not interested in the target language publications. It seems to be a major problem in terms of science education in Turkey just like in the case of other non-native English speaking countries. In terms of planning and carrying out a scientific research adequate instruction and training about how to prepare a thesis were not given and necessary encouragement on this subject was insufficient which might be among important reasons (3).

Despite the similarities in the rates of assessments of exercise testing and Holter ECG of the residents who worked in training-research and university hospitals, the rate of assessments in tilt table test was higher in university hospitals. The difference may have come out from the fact that tilt table tests were not done in some training-research hospitals.

The rates of residents who worked in university and training-research hospitals and did CA operations were similar but the rate of CA done by per capita was found significantly higher in the training-research hospitals. Similarly, it was found that the rate of invasive treatment (PTCA and STENT) processes and the resident doctors who performed these processes were more in training-research hospitals because of the number of the CA done and the cases which were done by the residents were more in the training-research hospitals. Although the rate of CA process was at a certain level, the rates of TEE, intraoperative

echo. And cardiac pacing performance rate, which is another invasive operation in the educational process of cardiology residents was lower. On the other hand, the number of the out-patients was the same in university and training-research hospital however the in-patients was higher in training-research hospitals than the university hospitals.

Simulation training promises to play an increasingly important role in technical skills training and will likely reduce the number of actual procedures to which a trainee must have direct exposure to achieve competence (11). No country can claim that specialization in medicine is free from deficiencies there. In this respect, it should be tolerated that there are problems and deficiencies in Turkey either. Legal arrangements that can be made by the ministry of education and autonomous university senates will hold an important place. However, the training of the lecturers is also very important in this process (4, 11).

Transferring scientific information and the knowledge of producing science to a mass of physicians, whose average age is relatively young can only be provided by being educated in training. The benefits of the extended periods of specialist education for the solution of problems should be discussed. Indeed, the shortening of the working-hours to prevent "burnouts" which are frequently seen in physicians and to provide "well-being" is suggested as a first step precaution (7, 12). It was also shown in Hutter et al. (13) study that the shortened working-hours of the resident doctors don't reduce the quality of patient care. In our study, approximately 2/3 of the participants found the duration of the legal specialist training sufficient. Therefore, increasing efficiency with educated instructors can be a more accurate approach than increasing the duration in solving the problems.

### Study limitations

Despite 5 years cardiology training program in Europe, this program is done 4 years in Turkey. This point reflects a limitation to comparing statistically our 4-year training program with ESC 5-year training program. The study population also was not last year's resident. However, the average of laboratory procedures numbers is outlined in the tables.

The analysis of differences between the Eastern and Western cities have not been identified. Discrimination of difficult or simply invasive intracoronary manipulations was not addressed in questionnaire. The differences between the clinics that the residents specialized in and the universities they graduated from were not evaluated.

### Conclusion

The training of the cardiology residents for applications, which are not interventional, is at an adequate level. However, the lack of interventional diagnostic and therapeutic applications is significant. This difference was more pronounced in

state hospitals. Although the rates of participation to national and international congresses and the number of publications per capita are low, they still claim not having adequate time to take part in recreational activities. However, they feel themselves efficient specialists after they complete the training period. Academicians, taking account of deficiencies and problems in assistant education for training more qualified physicians, have to reconsider their respective.

**Conflict of interest:** None declared.

### References

1. Burke DT, DeVito MC, Schneider JC, Julien S, Judelson AL. Reading habits of physical medicine and rehabilitation resident physicians. *Am J Phys Med Rehabil* 2004; 83: 551-9. [CrossRef]
2. Çiçek C, Terzi C, Solak A, Aksu G, Batu J, Vatanserver K, et al. Üniversite hastanelerinde temel bilimler alanında uzmanlık eğitimi: Tıpta uzmanlık öğrencisi bakış açısı ile. *Mikrobiyol Bul* 2005; 39: 491-501.
3. Aysan E, Köroğlu G, Türkeli V, Özgönül A, Özyaşar A, Gülümser Ç, et al. Resident physicians in Turkey: results of a survey of 1069 residents from 11 provinces. *Turk J Med Sci* 2008; 38: 35-42.
4. Narasimhan S, Ranchord A, Weatherall M. International medical graduates' training needs: perceptions of New Zealand hospital staff. *N Z Med J* 2006; 119: U2027.
5. Cohen JS, Patten S. Well-being in residency training: a survey examining resident physician satisfaction both within and outside of residency training and mental health in Alberta. *BMC Med Educ* 2005; 5: 21. [CrossRef]
6. Core Curriculum for the General Cardiologist; The European Society of Cardiology 2008. Available from: URL:<http://www.escardio.org/education/coresyllabus/Documents/esc-core-curriculum.pdf>.
7. Goitein L, Shanafelt TD, Wipf JE, Slatore CG, Back AL. The effects of work-hour limitations on resident well-being, patient care, and education in an internal medicine residency program. *Arch Intern Med* 2005; 165: 2601-6. [CrossRef]
8. Szafran O, Crutcher RA, Banner SR, Watanabe M. Canadian and immigrant international medical graduates. *Can Fam Physician* 2005; 51: 1242-3.
9. Mroczkowski P, Granowski D, Nestler G, Pross M, Lippert H. Situation of surgical residents in central Germany. *Chirurg* 2007; 78: 254-8. [CrossRef]
10. Wheatley GH, Lee R. Where have all the cardiothoracic surgery residents gone? Placement of graduating residents by United States thoracic surgery training programs, 1998 to 2002. *Heart Surg Forum* 2006; 9: E618-22. [CrossRef]
11. Klessig JM, Wolfsthal SD, Levine MA, Stickley W, Bing-You RG, Lansdale TF, et al. A pilot survey study to define quality in residency education. *Acad Med* 2000; 75: 71-3. [CrossRef]
12. Gopal R, Glasheen JJ, Miyoshi TJ, Prochazka AV. Burnout and internal medicine resident work-hour restrictions. *Arch Intern Med* 2005; 165: 2595-600. [CrossRef]
13. Hutter MM, Kellogg KC, Ferguson CM, Abbott WM, Warshaw AL. The impact of the 80-hour resident workweek on surgical residents and attending surgeons. *Ann Surg* 2006; 243: 864-71. [CrossRef]