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Short communication

Professional, scientific, and social life of cardiology specialists

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ABSTRACT

A questionnaire-based study was designed to assess the perceptions of cardiology specialists in Turkey regarding the working conditions, scientific and social life, as well as cardiology training. This transverse cross-sectional study was carried out with the voluntary participation of 143 cardiology specialist (81.4%, male). A questionnaire consisting of 34 questions was used to evaluate professional and scientific lives as well as the social activity level of the participants. More than half of the participants (51%) had a working experience of >10 years, and those with a preference for the fields of general cardiology, interventional cardiology, image-based cardiology, and arrhythmia represented 78.3%, 59.4%, 30.8%, and 10.5% of the study population, respectively. 53.1% of the cardiology specialists surveyed reported having participated in international multi-center trials as a co-investigator, and 80.5% reported being in the author list of publications included in Science Citation Index (SCI), SCI expanded, Social Science Citation Index (SSCI), and Arts and Humanities Citation Index (AHCI). 70% of the cardiology specialists included in the study reported that they could spend adequate time on social activities.

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Introduction

Cardiovascular Disorders (CVD) is the leading cause of death in industrialized countries. According to the 2002 data of World Health Organization (WHO), approximately 17 million individuals died of cardiovascular disease, and of these deaths 7.2 million were due to

coronary heart disease (CHD).¹ In a study from Turkey conducted in 1990, the prevalence of CHD was 4.1% and 3.5% among men and women, respectively.² The 5-year follow-up report by the same researchers showed that the death rate due to CHD was 4.3/1000 and 4.0/1000 in men and women, respectively. Based on current population estimations, it may be projected that there are approximately 1.5 million individuals with coronary artery disease in our country. Accordingly, each year >100,000 new cases of coronary artery disease are diagnosed, who subsequently require healthcare services from the national health system. Based on the data issued by the National Statistics Agency, it can be argued that the relative contribution of cardiovascular diseases to total mortality is progressively increasing, with cardiovascular diseases representing the major cause of mortality responsible for 40%, 45%, and 40% of all deaths in years 1989, 1993, and 2000, respectively.³ It is evident from these figures that the impact of CHD on total mortality in Turkey is similar to countries where CVD is considered a public health priority. The professional life conditions and the availability of adequately interventional cardiology units bear high significance for the practicing cardiology specialists who are actively involved both in the primary and secondary prevention of cardiovascular diseases. In this questionnaire-based study, our objective was to assess the above-mentioned factors among a group of cardiology specialists.

Methods

This cross-sectional study was carried out between March 2017 and June 2017, with the participation of cardiology specialists (n = 143) from Turkey. A 34-item questionnaire was used to assess the

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professional, scientific, and social life of the participants. The questionnaire included both open- and close-ended questions that gathered information on the duration of work, conditions of work, night shifts, number of patients currently followed-up, relative proportion of imaging and invasive procedures in the total workload as well as the availability of adequately equipped cardiology laboratories, frequency of attendance to scientific meetings and studies, social life etc. The questionnaire was sent to the participants via e-mailing, and was completed online. All participating physicians provided consent for the publication of data for research purposes. The questionnaires were completed by the participants over a 3-month period. For all statistical analyses, IBM SPSS version 21.0 was used (SPSS Inc., Chicago, IL, USA). Categorical variables were compared using chi-square or Fisher's exact test.

Results

Demographical and professional characteristics

The participants consisted of cardiology specialists currently employed in university hospitals (25.3%), private hospitals (12.6%), and state and research/training hospitals (62.2%) across Turkey. Most specialists (85.3%) were older than 30 years of age, and those with a working experience of >10 years comprised 73% of the cohort. Again, of the overall group, 25.2% were academicians, 14% were research associates/residents, and 60.8% were employed as specialists (Table 1). Majority of the physicians were practicing in the field of general cardiology (78.3%), with 30% and 59.4% being more actively involved in imaging and invasive cardiology services, respectively. Those focusing on arrhythmia, ablation therapy, and EPS comprised only 10% of the participants. Cardiology training in Turkey was considered inadequate by 61.5% of these specialists, while 38.5% had the opposite view. Also, 86% reported that they considered sub-specialty training necessary for a number of areas in cardiology such as arrhythmias, imaging, or intervention.

Patient follow-up load

Of the all cardiology specialists included in our survey, 74% reported seeing >100 outpatients per week, and 73% reported provision of

specialist services for <30 hospitalized patients per week. Most of the participants (46.1%) reported 5 or less night shifts per month, while 14% had more than or equal to 10 night shifts per month, and 14% had no night shifts.

Laboratory practices

The 73.4% of the participants reported performing >50 Transthoracic Echocardiography (TTE) procedures per week, while 65% performed <5 Transesophageal Echocardiography (TEE) procedures per week. With regard to invasive procedures, 74.1% of the physicians reported performing Coronary Angiography (CAG)/PCI, while 16.8% were employed in facilities with no coronary angiography laboratory. Electrophysiological studies (EPS) and ablation facilities were available in their facility in 46.6% of the cases. Only 9.1% of the cardiology specialists included in this study reported performing EPS and ablation, while approximately 50% performed pacemaker, Intra-cardiac Defibrillator (ICD), and Cardiac Re-synchronization (CRT) procedures (Table 2). Trans-catheter aortic valve implantation (TAVI) was undertaken in 43.6% of the health facilities in which the participants were employed.

Participation to scientific meetings, research and scientific publishing

Of the cardiology specialists participating in the survey, 53.1% reported a role as a co-investigator in international multi-center studies, with 80.5% listed as an author in publications cited in Science Citation Index and 78% reported membership in at least one international society (Table 3).

Participation to social activities

Seventy percent of the cardiologists reported reading at least one non-medical book per month, attending at least one social activity (going to a movie, theater, or concert etc.) per month, and 52.5% exercised at least for 30 min for at least one day per week. Proportion of cardiologists exercising for 30 min on 5 days of the week as

Table 1
Personnel and business characteristics of cardiologists.

		n	%
Sex	Female	26	18.8
	Male	117	81.2
Age	<30	21	14.7
	>30	122	85.3
Academic title	Resident	20	14
	Physician	87	60.8
	Lecturer in university	45	25.2
Work experience (year)	<5	18	13.6
	5–10	52	36.4
	>10	73	51
Hospital/institution	Private hospital	18	13.6
	MoH State Hospital, MoH Research and Training Hospital	69	62.3
	University	36	25.1
Night shifts (per month)	None	24	17
	<5	67	46
	6–10	33	23
	>10	20	14
Number of outpatients (per week)	<10	3	2
	10–50	17	12
	51–100	17	12
	>100	106	74
Number of inpatients (per week)	<10	59	41
	10–30	46	32
	>30	38	27

Total 143/100.

Table 2
Laboratory practices participation rates of cardiologists.

	n (143)	% (100)
Echocardiography		
None	4	2.8
<50	35	23.8
>50	105	73.4
TEE		
None	45	31.4
<5	65	45.4
5–10	19	13.2
10–30	10	7.2
>30	4	2.8
Interventional therapy (PTCA + stent)		
None	37	26
<5	14	10
5–10	46	32
10–30	34	23.7
>30	12	8.3
Pacemaker		
None	68	47.5
<5	45	31.5
5–10	22	15.4
10–30	6	4.2
>30	2	1.4
ICD/CRT		
None	79	55.2
<5	37	25.9
5–10	21	14.7
10–30	4	2.8
>30	2	1.4

CRT - cardiac resynchronization therapy, ICD - implantable cardioverter defibrillator, TEE - transesophageal echocardiography.

Table 3
Scientific life of cardiologists.

	n (143)	%(100)
Publications within SCI, SCI expanded, SSCI and AHCI journals		
None	26.8	19.5
<5	43	30.1
5–10	22	15.4
10–20	14	9.8
20–30	12	8.4
>30	24	16.8
Panelist in national congress		
None	67	46.8
<5	75	52.5
5–10	1	0.7
>10	0	0
Panelist in international congress		
None	123	86
<5	20	14
5–10	0	0
>10	0	0
Report in national congress		
None	36	25.1
<5	89	62.2
5–10	11	7.7
>10	7	5
Report in international congress		
None	86	60.1
<5	53	37.1
5–10	2	1.4
>10	2	1.4
Participation in international association		
None	31	21.7
<3	96	67.1
3–5	12	8.4
>5	4	2.8
Referee in scientific journal		
None	89	62.2
<3	35	24.5
3–5	10	7
>5	9	6.3
Participation in national research		
None	37	25.9
<4	82	57.3
>4	24	16.9
Participation in international research		
None	67	46.8
<4	68	47.6
>4	8	5.6

recommended by the 2016 European Cardiology Society, Cardiovascular Protection Guidelines was only around 9%.

Discussion

To the best of our knowledge, this survey represents the first study in Turkey encompassing a wide range of physicians in the field of cardiology from specialists to residents, research fellows, and academicians and examining their working conditions as well as scientific and social lives using a questionnaire based design. The questionnaires were sent by e-mail. Rates of positive response from e-mail or mail based medical studies without face-to-face contact are very low.^{4–6} Consistent with these previous observations, only a certain proportion of the cardiologists completed and returned the questionnaire. 85.3% of the participants were 30 years or older, and only 3.5% were at least 50 years of age; 13.6% had a short working experience (<5 years). In a previous study from the United States of America (USA) approximately 40% of the general cardiologists were around 55 years of age.⁷ The higher average age reported among cardiologist from the USA may be accounted for by a number of factors including the requirement for a 6-year training period to qualify as a cardiologist and importance placed upon minimum work experience. Of our participant cardiologists, 18.8% were female, similar to the figures reported from the USA where only 12% and 10% of general and interventional cardiologists respectively

consisted of female physicians.⁸ Most female physicians avoid fluoroscopic procedures during pregnancy, while such interventions are a prerequisite for right and left sided cardiac catheterization and diagnostic coronary angiography. Occupational exposure to radiation is a great source of concern during training and professional career among female cardiologists.⁹ This may have an impact on the preference of female physicians for cardiology training. Also, several other factors in the USA have been reported to affect the lower preference for cardiology training among female physicians including the duration of training required for achieving clinical competency, compensation fees, work-life balance, and family responsibility.⁸ Studies specifically examining such potential factors for lesser preference of cardiology specialty among female physicians are warranted in our country. The increase observed in the prevalence of coronary artery disease as well as in the number of therapeutic options for their treatment have allowed rapid advances in the field of invasive cardiology. This fact is also reflected in the practice of cardiology in our country. While such interventions could be undertaken in only 25 centers with only 93 physicians trained in invasive cardiology in 1992, the number of centers with invasive cardiology facilities has risen to 60 by the year 2000.¹¹ In our study, 83.2% of the participating physicians reported that they do not have a coronary angiography laboratory at their place of employment. The 74% of the cardiology specialists reported performing coronary angiography and invasive procedures (PTCA and stenting). In 1993, permanent pacemakers were implanted in 1100 cases, and majority of the pacemakers implanted consisted of single-chamber products, rather than double-chamber ones.¹⁰ In the current study, monthly number of pacemaker implantation and CRT procedures reported by the physicians were comparable, with some cardiologists performing >30 procedures per month.

The required duration of cardiology residency in Turkey is 2 years for physicians who have completed their internal medicine training, and 4 years for general physicians. After completion of this period of time, cardiologists are granted the legal rights to perform invasive cardiac procedures. In other countries, the requirements include 1 or 2 years of additional invasive training plus adequate number of invasive procedures performed.¹⁰ Of our participants, 61.5% viewed the cardiology training in Turkey inadequate, while 38.5% considered it adequate. Also, 86% believed that sub-specialty training should be implemented for areas such as arrhythmia, imaging, or interventions. Currently there are no such regulations in our country, and changes in relevant legislations are required.

In a 2011 study involving only cardiology residents, only 9.1% of the residents were included in the author list of publications in SCI, and 32.6% participated as an investigator in international trials. In addition, only 12.9% of the residents reported presentation in a national congress.¹² In our study, proportion of cardiologist in the author list of studies published in the context of SCI, SCI expanded, SSCI, and AHCI were 73.2%, while proportion of panelists in national congresses was 59.5%, and 74.1% reported having participated in international trials as co-investigators.

In the same study, only 32.9% of the cardiology residents reported spending adequate time on social activities,¹² as compared to 70% in our cardiologist participants (Fig. 1). In addition, 52.5% of our population reported minimum 30 min of exercise on at least 1 day of the week, while only 9% could perform the level of activity they recommend to their patients.

In conclusion, the number of publications per physician and time spent on social activities were higher in the current cohort as compared to figures reported in 2011. The proportion of cardiologists performing interventional cardiology procedures varies according to physician preferences as well as the availability of adequate facilities. Majority of the cardiology specialists believed that there was a need for subspecialty training in fields such as interventional imaging and arrhythmia. We believe that the data obtained in this questionnaire-based survey may shed some light on the future policies on cardiology training.

Fig. 1. Social life of cardiologists. a Monthly rates of cinema, theater and concert activities. b Rates of sporting events in a week. c Monthly rates of non-medical book reading.

Limitations

Small sample size represents the major limitation of our study. Secondly, the analysis of differences between the Eastern and Western cities of Turkey has not been identified.

Conflict of interest

On behalf of all authors, the corresponding author states that there is no conflict of interest.

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