



Anaesthesiology and Reanimation Education in Turkey: Residents' Views

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Abstract

Objective: This study aimed to determine opinions of medical residents undergoing anaesthesia and reanimation training about equipment, programmes, applications, study conditions and shift systems at training institutions in Turkey.

Methods: A web-based survey was sent by e-mail to residents in anaesthesiology and reanimation training programmes. The survey comprised 73 questions about demographic characteristics, satisfaction, basic specialisation knowledge, anxiety and motivation.

Results: The study included 270 individuals. Of the residents, 82.2% willingly chose their field, whereas 66.7% stated that specialisation was necessary because of incorrect application of first-stage and GP medical services. The mean of the weekly working hours was 91.69 ± 36.69 hours; the mean number of monthly on-call shifts was 7.49 ± 1.99 . Of the participants, 61.9% found the predicted five-year training duration long. The intensive care training duration was sufficient for 71.1% and only 26.3% found the pain management training duration sufficient.

Conclusion: According to the results, the number of residents is insufficient, workload is heavy, working hours are long and large numbers of shifts are worked without leave afterwards. In spite of negatives and high dissatisfaction, most residents willingly chose their departments and would choose the same branches again. Participants stated that their institutions emphasised service rather than education and research, and educators were less accessible to residents due to increasing service loads.

Keywords: Anaesthesia, anaesthesiologists, education, resident

Introduction

Medical residency training is a guided and supervised organised training programme to ensure the occupational and personal development of medical residents (MRs), so that they can provide reliable and appropriate health services to patients. During the specialisation-training process, MRs are given clinical and basic theoretical and practical training, aiming to ensure that they acquire the necessary competencies to provide effective health services, with the correct attitude and behaviour, basic research skills and administration and management skills (1).

In recent years, an effort to improve education, globally and in Turkey, has gained momentum and transformed into a pandemic (2).

The medical residency training in Turkey is regulated by the Medical Specialization Council (TUK/MSK). This commission was formed by the Turkey Ministry of Health and includes curriculum creation commissions (TUK-MOS). This commission defines clinical and interventional competencies for the anaesthesia and reanimation specialty. Internal rotations in intensive care, pain medicine and special surgeries in different surgical departments for anaesthesia purposes (such as neuroanaesthesia and cardiovascular anaesthesia) for a minimum period of 2-4 months are recommended. External rotations in cardiology and respiratory medicine are also recommended (3).

Previous studies in many fields have included scientific studies assessing the perspectives of MRs receiving specialisation training in Turkey (1, 2, 4-6). However, there are no previous studies that have assessed objective data related to the state of educational institutions, training and working environments from the viewpoints of anaesthesiology and reanimation MRs in Turkey.

The aim of this study is to report the equipment, specialisation-training programmes and applications, working conditions and shift systems of institutions involved in specialisation training for anaesthesia and reanimation and to identify the current state of specialisation training from the point of view of MRs.

Methods

This study is a cross-sectional survey study. It was completed after receiving permission from the Dokuz Eylul University Non-interventional Ethics Committee (dec. no. 2015/05-16, date: 12/02/2015, protocol no. 1917-GOA). A 73-item web-based survey (Appendix 1) was sent in a computer environment by e-mail to MRs in anaesthesiology and reanimation in Turkey. The e-mail addresses of MRs were obtained from their institutions. The survey form was sent to all MRs three times from 02/03/2015 at 4-week intervals until 02/06/2015. Completing the survey was not mandatory. MRs who did not complete the survey within three months were assessed as not consenting to participate in the study.

The survey form comprised 73 questions examining demographic characteristics, personal satisfaction, satisfaction with institutions, satisfaction with training, basic knowledge relating to specialisation, concerns about the future and motivation (1, 2, 4, 5).

In Turkey, according to data from the Ministry of Health, Health Education and Health Labor Force State Report from February 2014, there are 883 anaesthesiology and reanimation MRs in university hospitals. Projecting from the total 7297 MRs in all fields, as reported by the Ministry of Health, it was proportionally calculated that there might be 450 anaesthesiology and reanimation MRs. Therefore, it was determined that there were 1333 anaesthesiology and reanimation MRs in total in Turkey. Accepting 50% incidence for situations with unknown incidence, with 5% error accepted and 95% confidence intervals, it was determined that at least 170 MRs must participate in the study (7).

Statistical analysis

The answers to questions on the survey were analysed with the Statistical Package for the Social Sciences (SPSS Inc., Chicago, IL, USA) version 15.0 for Windows. Data describing means are given as the mean±standard deviation, whereas frequency data are given a number (n) and percentage (%).

The normality distribution of the data was analysed with the One-sample Kolmogorov-Smirnov test. For analysis of continuous data, depending on the distribution pattern, the Kruskal-Wallis test or the Mann-Whitney U test, or Student's *t*-test or ANOVA was applied. For frequency data, Fisher's exact test or the chi-square test was used. A value of $p < 0.05$ was accepted as a significant difference.

Results

A total of 270 anaesthesiology and reanimation MRs participated in our study. Of the MRs who participated in our survey, according to participants, the mean number of operating rooms/work areas at their centres was 22.52 ± 9.5 , with a mean number of MRs of 19.86 ± 9.20 , and the mean number of MRs required for work to proceed without problems was 31.95 ± 15.28 . The weekly working hours for MRs were 91.69 ± 36.69 hours. The number of night shifts was determined to be 3.43 ± 1.47 . The mean number of monthly night shifts worked was 7.49 ± 1.99 . After a mean of 0.89 ± 0.46 months, the participants began night-shift work, and the time to achieve the first senior assignment was 23.71 ± 10.38 months. Of the MRs participating in our study, 10 people (3.7%) stated that they used leave after night shifts. There was no difference observed between the use of leave after night shifts ($p = 0.075$) and their desire to use leave after night shifts ($p = 0.842$). Of the participants, 172 (63.7%) stated that they had MR representatives in their clinics. In the clinics, 222 participants (82.2%) had at least one professor present, whereas 235 (87.0%) had at least one associate professor present. In our study, 100 participants (49.8%) from university hospitals, 6 (54.5%) from affiliated hospitals and 22 (37.9%) from Ministry of Health hospitals stated that their institution had a structured 'medical specialisation resident training programme' (Table 1).

When MRs were asked where they learned information related to the anaesthesiology field, in all institutions, the most common answer was from a senior MR. The second most common answer was from 'trainers' at the affiliated hospitals, while 'text books and electronic environment' was the most common answer given by the participants from the university and Ministry of Health hospitals (Table 2).

The rates for interventional practical applications in anaesthesiology were similar for MRs participating in our survey. When the time to the first performance of various medical procedures was investigated, other than the mean time until the first percutaneous tracheostomy was performed, there were no significant differences found.

A very high proportion of participants reported that their institution's only priority was health services, and there was no significant difference among institutions (Table 3).

Table 1. Demographic, work and training characteristics of residents according to training institutions

	Ministry of Health Hospital (n=58)	University Hospital (n=201)	Affiliated Hospital (n=11)	p
Age	29.21±2.67	29.66±3.47	29.18±2.27	0.812
Sex (F/M) (%)	37 (63.8)/21 (36.2)	107 (53.2)/94 (46.8)	5 (45.5)/6 (54.5)	0.291
Duration of training of MRs (months)	20.54±15.64	22.61±16.98	26.91±18.09	0.555
Weekly working hours by institutions	87.50±40.80	93.59±36.25	79.09±9.85	0.003
Mean number of months until first senior assignment	18.39±11.80	25.54±9.13	21.00±16.70	0.021
Number of MRs who take leave after night shifts	5 (8.6%)	5 (2.5%)	0 (0%)	0.075
Presence of an MRs representative	28 (48.3%)	137 (68.2%)	7 (63.6%)	0.021
Presence of a Professor	32 (55.2%)	182 (90.5%)	8 (72.7%)	<0.001
Presence of an Associate Professor	48 (82.8%)	181 (90.0%)	6 (54.5%)	0.002
Incidence of a structured 'Medical specialisation Resident Training programme'	22 (37.9%)	100 (49.8%)	6 (54.5%)	0.252
Presence of an Intensive Care Branch Trainer	34 (58.6%)	155 (77.1%)	7 (63.6%)	0.045
Number of MRs who rated the duration of intensive care training as sufficient	41 (70.7%)	143 (71.1%)	8 (72.7%)	0.990
Presence of a pain management service in the clinic	7 (12.1%)	97 (48.3%)	2 (18.2%)	<0.001
Presence of pain management branch trainers	23 (39.7%)	155 (77.1%)	2 (18.2%)	<0.001
Number of MRs who rated the duration of pain management training as sufficient	9 (15.51%)	59 (29.35%)	3 (27.27%)	0.108
Exams for MRs in the clinic	42 (72.4%)	168 (83.6%)	9 (81.8%)	0.160
Presence of an MRs report (handwritten)	16 (27.6%)	92 (45.8%)	2 (18.2%)	<0.001
Presence of an MRs report (electronic)	4 (6.9%)	30 (14.9%)	7 (63.6%)	

MRs: Medical Residents

Table 2. Information on anaesthesiology learning resources of residents

	Ministry of Health Hospital n (%)	University Hospital n (%)	Affiliated Hospital n (%)	Total n (%)	p
Trainers	16 (27.6)	43 (21.4)	6 (54.5)	65 (24.1)	0.034
Senior MRs	41 (70.7)	166 (82.6)	7 (63.6)	214 (79.3)	0.061
Text books and electronic resources	24 (41.4)	78 (38.8)	3 (27.3)	105 (38.9)	0.678
Anaesthesia technicians	11 (19)	38 (18.9)	0 (0)	49 (18.1)	0.280
Health personnel other than clinicians	2 (3.4)	20 (10.0)	0 (0)	6 (2.2)	0.349

MRs: Medical Residents

By institutions, the significant difference between the number of internal rotations performed and the number recommended by the Anaesthesiology and Reanimation TUKMOS (medical specialisation committee for curriculum creation and standardisation) is noteworthy (Table 4). In our study, 47 specialty residents (81%) from the Ministry of Health hospitals, 180 (89.6%) from university hospitals and 9 (81.8%) from affiliated hospitals stated that they made at least one scientific presentation per year (paper, seminar or case report) ($p=0.193$). In our study, it was identified that in institutions, seminars were regularly organised, whereas journal club and case report meetings were only held infrequently. Of the

participants, 67% had no scientific publications, and 42.2% had not participated in any national meetings. The MRs who participated in the study from the Ministry of Health hospitals determined their thesis topics in 2.74 ± 0.66 years; those from university hospitals determined their thesis topics in 2.17 ± 0.63 years; and those from affiliated hospitals determined their thesis topics in 2.55 ± 0.52 years. There was a statistically significant difference found ($p<0.001$).

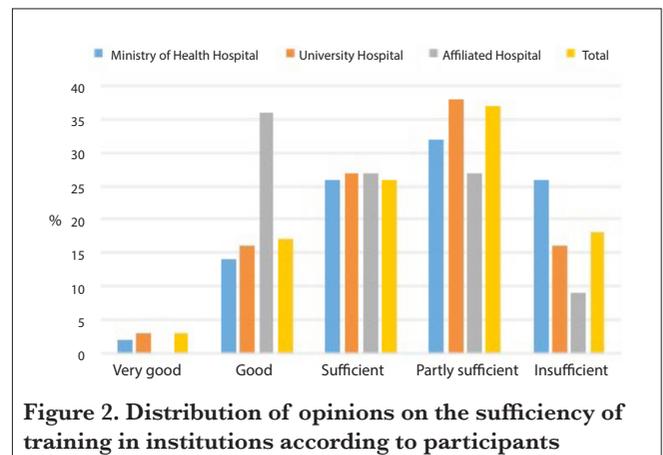
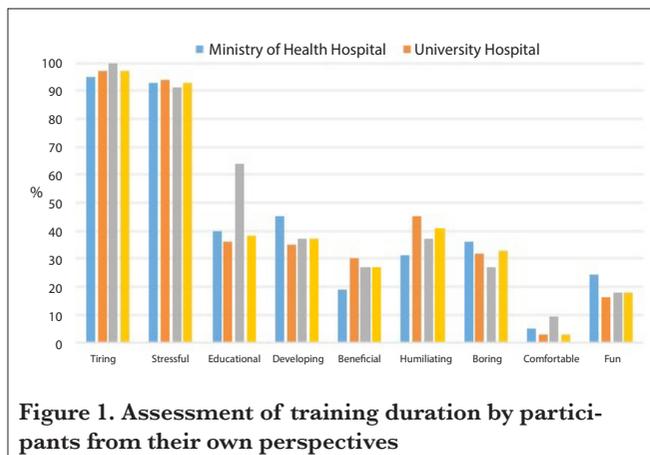
When MRs who participated in the survey were asked to evaluate the educational process from their own viewpoints, a significant proportion of participants assessed the training pro-

Table 3. Assessment of institutional priorities according to residents

	Ministry of Health Hospital n (%)	University Hospital n (%)	Affiliated Hospital n (%)	Total n (%)
Training, research and service	4 (6.9)	23 (11.4)	2 (18.2)	29 (10.7)
Training and service	11 (19.0)	54 (26.9)	2 (18.2)	67 (24.8)
Research and service	3 (5.2)	13 (6.5)	3 (27.3)	19 (7.0)
Only service	40 (69.0)	110 (54.7)	4 (36.4)	154 (57.0)
Only research	0 (0)	1 (5)	0 (0)	1 (4)

Table 4. Internal rotation/training of residents by institutions

	Ministry of Health Hospital n (%)	University Hospital n (%)	Affiliated Hospital n (%)	Total n (%)	p
Pain management	18 (31.0)	159 (79.1)	2 (18.2)	179 (66.3)	<0.001
Anaesthesia outside surgery	66.3 (75.9)	197 (98.0)	8 (72.7)	249 (92.2)	<0.001
Anaesthesia clinic	54 (93.1)	192 (95.5)	11 (100)	257 (95.2)	0.561
Anaesthesia for neurosurgery	54 (93.1)	194 (96.5)	11 (100)	259 (95.9)	0.401
Anaesthesia for kidney transplantation	19 (32.8)	139 (69.2)	5 (45.5)	163 (60.4)	<0.001
Anaesthesia for paediatric surgery	37 (63.8)	190 (94.5)	9 (81.8)	236 (87.4)	<0.001
Anaesthesia for general surgery	56 (96.6)	196 (97.5)	11 (100)	263 (97.4)	0.791
Anaesthesia for chest surgery	34 (58.6)	184 (91.5)	10 (90.9)	228 (84.4)	<0.001
Anaesthesia for ocular surgery	44 (75.9)	196 (97.5)	10 (90.9)	250 (92.6)	<0.001
Daily Hospital	11 (19)	92 (45.8)	2 (18.2)	105 (38.9)	<0.001
Gynaecology and obstetrics surgery anaesthesia	45 (77.6)	194 (96.5)	11 (100)	250 (92.6)	<0.001
Anaesthesia for cardiovascular surgery	39 (67.2)	199 (99)	10 (90.9)	248 (91.9)	<0.001
Anaesthesia for liver transplantation	7 (12.1)	117 (58.2)	4 (36.4)	128 (47.4)	<0.001
Anaesthesia for ear, nose and throat diseases	53 (91.4)	197 (98)	11 (100)	261 (96.7)	0.038
Anaesthesia for orthopaedics and traumatology	54 (93.1)	197 (98)	11 (100)	262 (97)	0.128
Anaesthesia for plastic, aesthetic and reconstructive surgery	47 (81)	190 (94.5)	10 (90.9)	247 (91.5)	0.005
Anaesthesia for urology	56 (96.6)	197 (98)	11 (100)	264 (97.8)	0.704
Intensive care	55 (94.8)	198 (98.5)	11 (100)	264 (97.8)	0.216



cess as tiring and stressful. The third most common response to this question given by MRs was that the training process

was ‘humiliating’. Among institutions, there was no significant difference in the assessment of training by MRs ($p > 0.05$)

(Figure 1). When asked how they evaluated the training proficiency of the people who provided training in their institutions, there was no statistically significant difference among the responses ($p=0.528$) (Figure 2).

There was no statistically significant difference among the institutions in terms of the answers of MRs to the question of whether they considered they would have the knowledge and skills to operate and manage a clinic at the end of their specialisation training ($p=0.372$). One hundred and thirty participants (48.1%) felt that they would have the ability and skills to operate and manage a clinic at the end of their specialisation training.

Discussion

In our survey study, anaesthesia and reanimation education in Turkey at university hospitals, affiliated hospitals and Ministry of Health education and research hospitals was investigated and compared among the different institutions (1, 6).

MRs who participated in our study worked a mean of 91.69 ± 36.69 hours per week. Studies on general surgery MRs in 1997 (8) and 2010 (1) reported that the median weekly working duration of MRs including night shifts was 120 and 100 hours, respectively. A study by Citak et al. (5) of chest and cardiovascular surgery experts similarly found that the weekly working hours were 90 hours or more. In the study by Buget et al. (9), the difficulties of anaesthesiology MRs were related to the work, and continuing work after a night shift was clearly addressed (43%). In the study by Yavascaoglu et al. (10), anaesthesiology MRs who worked 32-hour shifts had neuropsychological impairments. They emphasised that a depressive mood, anxiety and stress were more frequently observed in those anaesthesiology MRs who worked 32-hour shifts. Similarly, Saricaoglu et al. (11) found that the cognitive function of anaesthesiology MRs was impaired after night-shift work. They concluded that the working schedules of anaesthesiology MRs should be reconstructed to minimise possible mistakes and increase patient safety. In the United States of America, working more than 80 hours a week has been banned since 2004 (4). In the European Union, since August 2004, the weekly working duration has been 56 hours, and 11 hours of uninterrupted leave after 24 hours on duty is a legal requirement (4, 12, 13). There are concerns that reduced working hours will prevent gaining sufficient surgical experience and lengthen the already long specialisation-training period (13). It is not easy to achieve the same educational targets for specialisation training in a shorter time. The European Union of Medical Specialists 'UEMS Section of Surgery' recommended a 60 hour per week working timetable for general surgery MRs to the European Parliament (1, 4, 13). In European Union countries, it was recommended that the

weekly working duration for the Union of European Medical Specialists Section of Surgery be increased from 45 hours to 60 hours (1).

In our study, 52.6% of participants stated that there was no structured 'Core Educational Programme (CEP)' in their institutions. In the study by Cicek and Terzi (4), there was a structured CEP in 49% of Ministry of Health associated hospitals. By contrast, in our study, there was no statistically significant difference among institutions. In 2012, a study of chest and cardiovascular surgery residencies found that 78.2% of residencies had no CEP (5).

In answering the question of how they would describe the priority of service at their institution, 57% of participants answered 'only service'. According to the study by Cicek and Terzi (4), 59.5% of MRs stated that their institutions only valued service, while 2.5% stated that education was given a higher priority. In a study of chest cardiovascular surgeons (5), 64.2% of participants stated they only had time for service duties, while only 14.2% stated that all components of the Medical Specialisation Code of education, research and service were met by their institutions. In addition, similar results were obtained from other studies conducted during different years and involving different residency groups. Our study reiterates the reality that the effect of the current performance system is oriented more towards service work.

Previous studies (5, 14, 15) have stated that to support theoretical knowledge in residency education, theoretical lessons, case reports, seminars, journal clubs, and mortality/morbidity meetings were supportive components. In our study, 87.4% of participants stated that scientific presentations were made in their institutions. One in ten participants stated that there were morning meetings in their institution. In a 2013 study of 52 anaesthesiology and reanimation departments in Sweden (14), 75% of departments had morning meetings every day, 14% had meetings once a week and 8% did not have such meetings.

In our study, nearly all the participants stated that the training process was tiring and stressful. Only one-third of participants found the training process to be educational and developing. A large proportion of participants (41%) stated that it was humiliating. Of the participants in the study by Citak et al. (5), 69.3% stated that they had experienced mobbing/bullying in the workplace. In that study, 37.8% of MRs described their training as humiliating. They stated that the understanding of seniority and hierarchical relationships in surgical departments required reorganisation. A study by Aykut et al. (16) that assessed exposure to mobbing by MRs in educational anaesthesiology and reanimation clinics in Turkey found that 69.3% of the 101 participants had experienced mobbing at

least once during their specialisation training. A 2006 study by Cicek and Terzi (4) found that in answer to the question 'How would you assess your training process?', 64.3% of MRs stated that it was tiring, 58.4% said it was stressful, 33.7% said it was educational or developmental, 41.7% said it was beneficial, 28.5% said it was enjoyable, 21.4% said it was humiliating and 15.5% said it was boring. In our survey, 96.7% of survey participants said that the training process was tiring, 93% said it was stressful, 41% said it was humiliating, 37% said it was educational, 37% said it was developmental, 33% said it was boring and 27% said it was beneficial. A study by Cicek and Terzi (4) determined that participants in university hospitals found the training process to be more educational, beneficial and stressful, whereas there was no significant difference among institutions. In our study, there was no significant difference observed among institutions. Another previous study of general surgery MRs¹ found that the proportion of participants who were fully satisfied with their training process was 6%, while 15% stated that they were not satisfied with the whole training process. The results were different based on the number of years of seniority of the MRs. The dissatisfied rate among third-year MRs was notably high. A study in the United States of America in 2009 (17) found that the majority of general surgery MRs were highly satisfied with their specialisation training. Another study of 270 radiology MRs (18) found that 77.8% of participants were satisfied with their specialisation-training programme. Anaesthesia residents in Taiwan are treated as an integral part of hospital work force (19).

A study of urology MRs (2) found that 58% thought their practical education was sufficient, while only 14% found their theoretical education to be sufficient. Of the participants, 47% reported that trainers did not provide residency lessons during lesson hours. A study by Cicek and Terzi (4) of 578 MRs found that according to half of the participants, their trainers were provided insufficient training. Of those trainers who were not proficient, 70% worked at Ministry of Health hospitals. In the same study, 66% of participants thought the reason for the insufficient training was an excess patient load, 54% thought it was a lack of interest and 31% thought it was due to the intensity of administrative or external scientific duties. The study by Citak et al. (5) found that one of every two MRs found that their trainers were 'insufficient', with the majority of these trainers working in Ministry of Health hospitals. In this study, the heavy workload and lack of will of the trainers were emphasised as the most important reasons. Citak et al. (5) stated that the reason why the majority of trainers in Ministry of Health hospitals were found by MRs to provide insufficient training might be due to the large proportion of trainers needed due to the health services load in these hospitals. In the study by Cicek and Terzi (4), 69.5% of participants from university hospitals and 25% of those working in Ministry of Health hospitals found that the num-

ber of educators was 'sufficient'. Another study (1) found that only 14% of clinicians stated that they were satisfied with the time provided by trainers, regardless of the organisation or the residency year. In our study, 17.8% of participants found their trainers to be insufficient, while 2.6% of trainers were identified as very good. In our study, there was no difference among institutions.

In 2003, a reform of the health services began in Turkey. This reform is known as the Health Transformation Programme (HTP). The main components of the HTP include unification of the existing insurance schemes under one institution, introduction of compulsory social health insurance, incorporation of performance-related payments, restructuring of health service delivery via the introduction of family medicine, granting autonomy to public hospitals and strengthening the stewardship role of the Ministry of Health (MoH) (20). However, the staff had negative attitudes about the performance-based additional payment system (21). HTPs can cause inadequate numbers of MRs. HTPs and performance-related payment increase the performance pressure on medical doctors. Giving priority to the service causes trainers to be in a less accessible position for MRs due to the increased service load. An increased workload and a decreased number of MRs also increase the working hours of MRs.

There are certain limitations of this study. This research only provides information about the thoughts of current MRs about their education. We did not evaluate any similar previous work involving anaesthesiology residents, so we cannot comment on whether the situation became better or worse for them. Second, there might be other reasons why residents were disappointed, which might have gone undetected in this survey.

Conclusion

Participants in our survey reported that their institutions gave priority to service, trainers were less accessible and some rotations were insufficient. Clinicians found the training process generally tiring and stressful, with only half of participants feeling that they would have the skills and knowledge necessary to manage a clinic at the end of their specialisation training. Ultimately, MRs thought that there were no specific training programmes, their workload was too heavy and they were dissatisfied with the educational programmes.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Dokuz Eylul University (Date: 12.02.2015; Protocol No: 1917-GOA).

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