



To our knowledge, no data exists regarding Romanian trainee concerns. This paper brings forward such data, collected and analysed from Romanian trainees in the cited European survey.

## Methods

The survey included seven categories of information: autonomy transition, technical skills, exchange programmes, residency costs, residency workload, employment prospects and educational contents. These information categories were spread in ten parts, using commercially available software (Survey Monkey Inc., Palo Alto, California, USA, [www.surveymonkey.com](http://www.surveymonkey.com)) and were addressed via closed-ended questions. The first part regarded demographic information. The next seven parts each addressed the seven concerns in the hypothesis (see above). Opinion and satisfaction were graded using a Likert scale of 1 to 10. In the next parts, survey respondents were asked to grade concerns from “least important” to “most important”, on a scale of 1 to 7. An eighth part focused on improvement paths for the previously explored questions. Finally, questions dedicated to networking and aimed at improving the newly created ESATN were added in a tenth part.

The questionnaire was broadcasted via various networks and was accessible online for 4 months, from mid-May 2015 to mid-September 2015. During this time, e-mails were sent to all ESA trainee members, all abstract presenters at ESA Annual Meetings of 2014 and 2015, all European National Societies of Anaesthesiology Presidents, all National Anaesthesiologists Societies Committee (NASC) of the ESA and to all ESA Council members. Furthermore, the ESATC organised a booth at the annual meeting in Berlin, 2015, where dissemination of information and survey completion also took place.

The survey designers previously established a threshold for representativity for each country at an absolute number of thirty trainees who initiated the survey coming from that country.

Statistical analyses were performed using IBM SPSS Statistics 21.0 (IBM Corp., Released 2012. IBM SPSS Statistics for Windows, Version 21.0 Armonk, NY: IBM Corp.).

## Results

Full results are available in the European Survey – D. Sobreira Fernandes et al., 2018 [10].

A total of 72 respondents undergoing training in Romania started the survey. Of these, 32 finished the survey (44.4%). It can be noted that, out of the total population of responders to the European survey who initiated and finished it, these represent 10.8% and

10.5%, respectively. Demographic characteristics are displayed in Table 1.

**Table 1.** Characteristics of final sample of trainees

Variable	N	n	%
Country of birth	72		
Romania		70	97.2
Republic of Moldova		2	2.7
Country of anaesthesiology residency	72		
Romania		72	100
Gender	72		
Male		25	34.7
Female		47	65.2
Age, mean (SD)	72		28.5 (4.21)
Still a trainee	72		
Yes		72	100
Residency duration	72		5.0
Residency year of training	71		
1 <sup>st</sup>		11	15.4
2 <sup>nd</sup>		18	25.3
3 <sup>rd</sup>		15	21.1
4 <sup>th</sup>		20	28.1
5 <sup>th</sup>		7	9.8

SD – standard deviation

The main needs of the 32 Romanian anaesthesiology trainees who completed the questionnaire were, in descending order: “educational contents/EDAIC”, “technical skills”, “exchange programmes”, “residency workload”, “residency costs” and “autonomy transition” (Table 2).

**Table 2.** Romanian anaesthesiology trainees’ main concerns

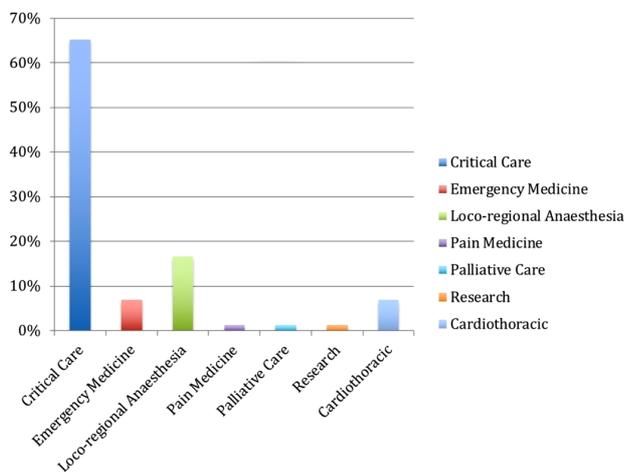
Issue	Importance – median (IQR)
Autonomy transition	3 (4.0)
Technical skills	5 (3.0)
Exchange programmes	4 (3.5)
Residency burnout	4 (3.5)
Employment prospects	4 (3.0)
Residency costs	4 (3.5)
Educational contents/EDAIC	6 (4.0)

The main field of interest of Romanian trainees was critical care medicine (65.2%) (Figure 1); a distant second was loco-regional anaesthesia (16.6%) with equal interest in emergency medicine and cardiothoracic anaesthesiology (6.9%). While a good correspondence exists between these fields of interest and the time allocated in training, when asked about training quality, results are less satisfactory (Table 3).

Theoretical and practical teaching were found to be good (6-7 out of 10 points on the evaluation scale) difficult airway management, hemodynamic monitoring, advanced life support, trauma management, intra-operative and ICU respiratory care, loco-regional

**Table 3.** Anaesthesiology trainees' evaluation regarding practical skills

Skills	Theoretical teaching -median (IQR)	Practical teaching -median (IQR)
Difficult airway management	7 (3.0)	7 (3.0)
Haemodynamic monitoring	7 (2.0)	7 (3.0)
Vascular access	7 (4.0)	8.5 (3.0)
Advanced life support	7 (2.0)	7 (3.0)
Trauma management	7 (3.0)	6 (3.0)
Neonatal resuscitation	4 (4.0)	4 (5.0)
Intraoperative and ICU respiratory care	7 (3.0)	7 (3.0)
Loco-regional anaesthesia/analgesia	6 (3.0)	7 (5.0)
Bleeding management	7 (3.5)	7 (4.0)
Complex clinical reasoning	6 (3.0)	7 (3.0)
Anaesthetic drugs clinical pharmacology	7 (3.0)	7 (3.0)
Invasive pain procedures	5 (3.0)	6.5 (4.0)
Ultrasonography	3 (4.5)	4 (5.75)
Extracorporeal devices	5 (4.0)	5 (6.0)

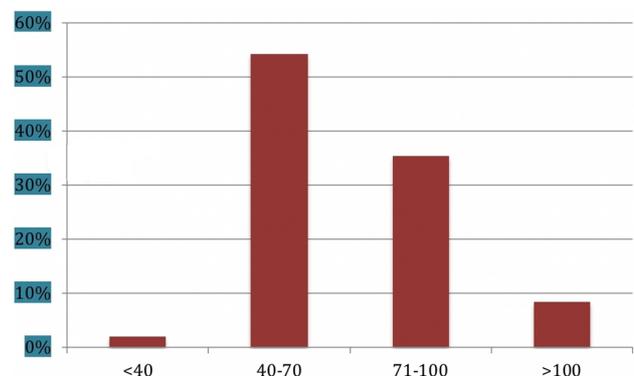
**Fig. 1.** Romanian trainees' main fields of interest

anaesthesia, bleeding management and anaesthetic drugs clinical pharmacology. Good theoretical teaching and excellent practical teaching (8.5 out of 10) were appreciated by trainees for vascular access. Conversely, trainees judged as poor (1-3 points) or mediocre (4-5 points) training in neonatal resuscitation, invasive pain procedures, ultrasonography and extracorporeal devices (Table 3). 46.3 % of trainees received some form of simulation training and 53.7% received no simulation training at all.

When asked about training abroad, 34.6% of trainees answered that they had already done it. In terms of reasons for training abroad, most trainees wanted to develop a skill in a reference centre, some thought it would be a good life experience and only 5% answered that it was an institutional request. For those who did not train abroad (65.4%), the leading reason was related to costs (42%), followed by family reasons (39%), and only 6% declared lack of interest in such an experience.

As for training costs, Romanian trainees declared they were affected to a large extent by the high costs and lack of funding for attending extra-curricular activities such as: international congresses (9 out of 10), internships abroad (8 out of 10), expenses for books and journals (8 out of 10), technical and non-technical skills courses (7 out of 10), national congresses (6 out of 10) (Table 4). 86% answered they had given up at least once to activities or educational opportunities for economic reasons. 80% of survey respondents answered they had to work extra-shifts regularly due to economic reasons.

When asked about workload (Figure 2) 54% of trainees declared they spend an average of 40-70 hours per week doing clinical work, 35% declared 71-100 hours per week and 8% in excess of 100 hours. The main contributors to the workload were intensive care units, anaesthesia extra-shifts, scientific work and examinations.

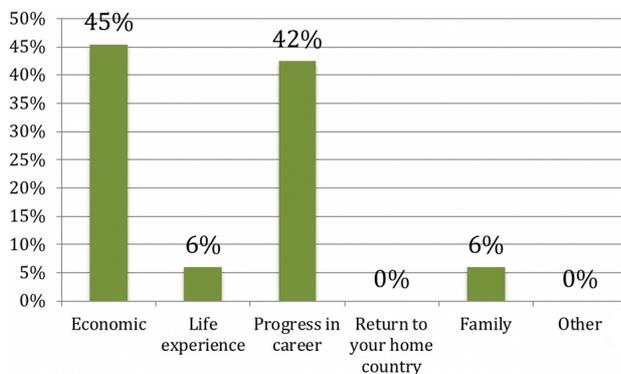
**Fig. 2.** Hours spent per week for clinical work

Regarding the concern of "employment perspectives", 78% of the responders answered they considered to emigrate after finishing their training period.

**Table 4.** Anaesthesiology trainees' answers regarding the residency cost concern

Activities	Extent to which trainees were affected by economic reasons – median (IQR)
National Congresses	6 (3.0)
International Congresses	9 (2.0)
Internships abroad	8 (3.0)
Technical and non-technical skills courses	7 (3.5)
Expenses for books and journals	8 (3.0)
Societies memberships application/renewal	7 (2.5)
Exams fees	7 (3.0)

The main reasons were economic (45%) and to progress in their career (42%) (Figure 3). 52% of those planning to emigrate chose Western Europe as a probable destination. Other potential destinations were Northern Europe (15%), Australia (12%), Central Europe (9%), Eastern Europe (6%) and North America (6%).

**Fig. 3.** Reasons for emigration

While all Romanian trainees have to pass the European Diploma of Anaesthesiology and Intensive Care (EDAIC) part I, as part of the national examination for obtaining the specialist diploma [11], only 17 out of 42 respondents (40%) planned to also take the EDAIC part II. For 76% of those not planning on taking EDAIC part II examination, costs were the main reason. In order to improve their preparation for the EDAIC, the respondents found necessary to further develop the following topics: anaesthesia and physics, respiratory physiology, cardiovascular physiology, anaesthesia and obstetrics, neuraxial anaesthesia, fluid and electrolyte management.

## Discussion

When judging the quality of training in an educational system, responses from those who are trained are one of the parameters to address and take into consideration. Attention should be paid to the existence of a certain degree of heterogeneity between different university centres in Romania concerning not only the quality of the educational process, but also the evaluation

methods of trainees' theoretical and practical skills acquisition during residency. Given the fact that these data are the first published data coming from the Romanian training system, we believe they can be a good starting point for further discussion on where educational stakeholders should start applying change.

A first observation coming from these data is that Romanian anaesthesiologists in training are highly concerned and interested in the field of intensive care medicine. Romanian Anaesthesiology Curricula already integrates a 2-year period dedicated to intensive care medicine, so at this point efforts should be made to better organise its content and possibly integrate perioperative medicine [12, 13]. Future national congresses should continue to invest in themes related to intensive care medicine, in order to promote high quality continuous medical education for perioperative physicians.

Secondly, teaching quality seems to be uneven in the various domains of competency. Such differences have previously been reported [13]. While some are judged to be of good quality, trainees judged to be receiving poor or mediocre training in neonatal resuscitation, invasive pain procedures, ultrasonography and extracorporeal devices (Table 3). Of concern is the fact that no domain of competency was judged to be excellent in neither theoretical nor practical training. While the survey is not the adequate tool to assess the reasons, we note that simulation training is received only by a minority of trainees and remains a field that could be worth investing in.

An important theme in the public and academic agenda is medical professional reimbursement and consequent transfer of workforce from low to high income economies. Urgent action is needed to reduce massive migration [14]. Still, we find that many of the obvious reasons for this transfer are mentioned by the trainees – excessive workload, pay gap, little perspective of professional progress –, all of which lead to an alarming proportion of 78% of trainees who plan to emigrate, most of them to Western Europe.

According to this survey's results, the main reasons for emigration are financial issues and career progress. However, when considering the financial reasons, two matters should be taken into account. The first one is

physician payment, which must be adapted to balance the current cost of living in Romania. The second one is related to the funding of the medical system and especially of the anaesthesia and intensive care medicine specialty. Although in the last years additional funding was directed to anaesthesia and intensive care medicine units around the country through special financing programmes, the amounts are not sufficient.

Career progress is also an important reason to be taken into account when considering emigration. Training in new anaesthesia and intensive care medicine techniques such as ultrasonography, extracorporeal devices and invasive pain procedures is judged to be of mediocre quality (Table 3). Reasons for this include lack of equipment, simulation centres, trainers and the heterogeneity among centres in terms of quality of training, although these issues were not addressed by the current survey [8]. Training programmes including theoretical teaching and practical skills acquisition are annually organised by the Romanian Society of Anaesthesia and Intensive Care (RSAIC) and recent national congresses included trainee-dedicated workshops and symposia. However, these activities should be expanded and adapted to the needs of the trainees.

The fact that educational content and EDAIC part I is one of the main issues of interest for Romanian trainees, associated with the fact that the passing rate for EDAIC part I remains low should lead to the implementation of changes in the current training structure. Although acquisition of theoretical and practical skills finally depends on each trainee's motivation, training modules including simulation programmes and e-learning platforms, as those already offered by the ESA for its members, could be of help especially for those centres with limited resources. To this end, we must take notice that since survey completion members of RSAIC are also associate members of the ESA, which brings free access to significant ESA online resources, including three highly regarded Anaesthesiology and Critical Care scientific journals.

The study has some important limitations, the most obvious being the small number of physicians in training which have finished the questionnaire. Another limitation may be represented by the fact that trainees were not asked about their residency centre, so at this point it is impossible to analyse if the results are representative for multiple centres. While not representing the whole population of trainees from Romania, we consider this sample to be relevant. Firstly, the pre-study condition of an absolute number of 30 trainees who started the survey is achieved. Secondly, they represented a significant proportion of all respondents – 10.8% of those who started the European survey and 10.5% of those who finished it. Concerning the number

of Romanian trainees, we estimated that currently there are about 600 trainees in active formation. Thus, approximately 12% of Romanian trainees started the survey and 5.3% of them completed it. Furthermore, in the European cohort, the Romanian trainees are third in absolute number of trainees that started the survey. Therefore, we consider this sample, while small in absolute figures, to be relevant for the Romanian trainees.

## Conclusions

The survey points up to the gaps in training in Romania, to the costs of extracurricular activities and to the high proportions of trainees wishing to migrate to other countries. These results should be thoroughly analysed by the RSAIC, universities and authorities in order to find solutions for improvement of training in retentions of specialists in Romania.

## Conflict of interest

Liana Valeanu, Mihai Stefan, Michela Rauseo and Bernardo Matias were members of the European Society of Anaesthesiology Trainee Committee (ESATC) between 2015-2016.

Bernardo Matias is currently the Chair of the ESATC.

Diogo Sobreira Fernandes was Chair of the ESATC between 2015-2017.

Serban Bubenek is currently the Romanian representative in the National Anaesthesiologists Societies' Committee (NASC) of the ESA and is President-elect of the Romanian Society of Anaesthesia and Intensive Care.

Daniela Filipescu was President of the ESA between 2014-2015.

## Acknowledgement

The authors would like to thank the ESA leadership and staff for its support and for making available the data regarding individual countries. We also thank the NASC Chair, Professor Dan Longrois for his guidance during the survey conception and analysis of the results.

## References

1. Union Européenne des Médecins Spécialistes / European Union of Medical Specialists. Training Requirements for the Specialty of Anaesthesiology, Pain and Intensive Care Medicine: European Standards of Postgraduate Medical Specialist Training [internet]. Brussels: UEMS; 2013 [cited 2018 Feb 12]. Available from: <http://www.eba-uems.eu/resources/PDFS/Training/Anaesthesiology-Training-Requirements-March-2013.pdf>.
2. Union Européenne des Médecins Spécialistes / European Union of Medical Specialists, The Standing Committee on Education and Training of the Section and Board of Anaesthesiology. Anaesthesiology, Pain and Intensive Care Medicine: Syllabus to the Postgraduate Training Program [internet]. Brussels: UEMS; 2017 [cited 2018 Feb 27]. Available from: <http://www.eba-uems.eu/resources/PDFS/Training/Anaesthesiology-syllabus.pdf>.

3. Frank JR, Snell L, Englander R, Holmboe ES; ICBME Collaborators. Implementing competency-based medical education: Moving forward. *Med Teach* 2017; 39: 568-573. doi: 10.1080/0142159X.2017.1315069
4. Nousiainen MT, Caverzagie KJ, Ferguson PC, Frank JR; ICBME Collaborators. Implementing competency-based medical education: What changes in curricular structure and processes are needed? *Med Teach* 2017; 39: 594-598. doi: 10.1080/0142159X.2017.1315077
5. Yusuf E, Ong DSY, Martin-Quiros A, Skevaki C, Cortez J, et al.; Trainee Association of the European Society of Clinical Microbiology and Infectious Diseases (ESCMID). A large survey among European trainees in clinical microbiology and infectious disease on training systems and training adequacy: identifying the gaps and suggesting improvements. *Eur J Clin Microbiol Infect Dis* 2017; 36: 233-242. doi: 10.1007/s10096-016-2791-9
6. Herregods LL, Demeerre JL, Baele PL, Himpe DG, Vandermeersch E. Results of the 2004 Belgian enquiry concerning Anaesthesiology. What kind of help do we need? *Acta Anaesthesiol Belg* 2004; 55: 311-318
7. Moon TS, Lim E, Kinjo S. A survey of education and confidence level among graduating anesthesia residents with regard to selected peripheral nerve blocks. *BMC Anesthesiol* [Internet]. 2013 Dec. [cited 2018 Mar 24]; 13(1). Available from: <http://bmcanesthesiol.biomedcentral.com/articles/10.1186/1471-2253-13-16>
8. Longrois D, Sandner-Kiesling A, Sobreira Fernandes D, Rauseo M. ESA trainee network: What can ESA do for you? *ESA Newsl Online* [Internet]. 2015; (61). Available from: <http://newsletter.esahq.org/esa-trainee-network-what-can-the-esa-do-for-you/>
9. Filipescu D. Letter from the President. *ESA Newsl Online* [Internet]. 2015; (61). Available from: <http://newsletter.esahq.org/letter-from-the-president/>
10. Sobreira Fernandes D, Teixeira L, Longrois D, Ateleanu B, Bornemann-Cimenti H, Sá Couto P, et al. The main concerns of European anaesthesiology postgraduate trainees: A European survey. *Trends Anaesth Crit Care* 2018; 18: 3-9. doi: 10.1016/j.tacc.2018.01.006
11. Ateleanu B, Goldik Z, Varvinskiy A, Moisin, T, Hasan N. An overview of the European Diploma of Anaesthesia and Intensive Care and of other important initiatives of the European Society of Anaesthesiology. *J Rom Anest Ter Int* 2013; 20: 137-144
12. tefan M, V leanu L, Sobreira Fernandes D. Anaesthesiology Trainees: We are also intensivists. *ICU Manag Pract* 2017; 17(2): 112.
13. Longrois D, Fischer D, Valeanu L. Does ESA meet the trainees' expectations in Europe? The trainees have their say about their expectations via a survey. *ESA Newsl Online* [Internet]. 2016; (64). Available from: <http://newsletter.esahq.org/does-esa-meet-the-trainees-expectations-in-europe-the-trainees-have-their-say-about-their-expectations-via-a-survey/>
14. Mitre C, Breazu C, Mitre I, Filipescu D. Migration of skilled anaesthesiologists from low to high-income economies: Urgent action needed. *Eur J Anaesthesiol* 2016; 33: 157-159. doi: 10.1097/EJA.0000000000000382