Research Doi: 10.25282/ted.884881

Pulmonologists' Competencies in Bronchoscopy Graduated from the Same University Clinic

Aynı Üniversite Kliniğinden Mezun Olan Göğüs Hastalıkları Uzmanlarının Bronkoskopi Yetkinlikleri

Albena GAYEF[*] (ORCID: 0000-0002-1260-0631)

Haydar Celal KARLIKAYA[*] (ORCID: 0000-0001-7084-4987)

[*]Trakya Üniversitesi Tıp Fakültesi, Edirne, TÜRKİYE

Corresponding Author: Albena GAYEF, E-Posta: albenagayef@trakya.edu.tr

Abstract

Aim: One of the primary competencies of pulmonologists is bronchoscopy. Bronchoscopy is looking inside the lungs with a medical instrument and performing necessary procedures. There are various techniques and methods performed under local or general anesthesia with flexible or rigid devices aiming diagnosis and/or treatment. Bronchoscopic procedures are classified as basic (defining and diagnosing pulmonary conditions, basic operative skills, sampling skills etc) and advanced bronchoscopic procedures (such as rigid bronchoscopy, therapeutic bronchoscopy procedures etc). Today in our country, competency-based education has been adopted for medical specialty training. Core curriculum and minimum educational standards were defined. In this study, we aimed to determine the pulmonologists' bronchoscopy competencies, potential variables and to evaluate training needs.

Methods: A questionnaire was applied to pulmonologists in electronic environment. The questionnaire was including qualitative and quantitative questions such as the educational environment and opportunities, the number of procedures attended, or performed by themselves during and after their assistantship. Data on 11 first level (such as anatomy, mucosa, secretions, maneuvers, flexible bronchoscopy, endobroncial forceps biopsy) and 8 second level (such as foreign body removal, rigid bronchoscopy) seniority in bronchoscopist competencies were analyzed with MSExcel and SPSS softwares.

Results: The mean age of 29 pulmonologists (14 female and 15 male) was 43.8 ± 6.9 years. Their graduation years from specialty training ranged from 1999 to 2017, with a median of 2008. According to the self-assessment results, basic bronchoscopist competencies were 7-76 % at the end of the specialty training. There was an insignificant improvement (14-86 %) throughout working as a specialist doctor. Advanced bronchoscopist competencies were 28-72 % at the end of the specialty training. There were some significant improvements only in the endobronchial ultrasonography (EBUS), endobronchial ultrasonographic fine needle aspiration (EBUS-FNA) and argon plasma coagulation competencies (APC) throughout working as a specialist doctor.

Conclusions: It was evaluated that the basic bronchoscopist competencies of the pulmonologists are not at sufficient level. The results obtained in this study support the need for competency-based training. This study also emphasizes that more attention should be paid to continuous professional development after graduation.

Keywords:
Bronchoscopy, Competency, Pulmonologist, Clinic

Anahtar sözcükler:
Bronkoskopi, Yetkinlik, Göğüs Hastalıkları Uzmanı, Klinik

Gönderilme Tarihi
Submitted: 22.02.2021
Kabul Tarihi
Accepted: 15.11.2021

To cite this article: Gayef A, Karlıkaya HC. Pulmonologists' Competencies in Bronchoscopy Graduated from the Same University Clinic. World of Medical Education. 2022;21(63):31-41

Özet

Amaç: *Göğüs hastalıkları uzmanlarının temel yetkinliklerden birisi bronkoskopidir. Bronkoskopi bir tıbbi alet ile akciğerlerin içini gözlemek ve gerekli işlemleri yapmaktır. Tanı ve tedavi amaçlı, esnek ve rijit cihazlar ile, lokal veya genel anestezi altında yapılan değişik teknik ve uygulamalar vardır. Bronkoskopik yöntemler temel (solunum yollarındaki durumları tanımlama ve tanılama, temel uygulama becerileri, örnek alma becerileri vs.) ve ileri bronkoskopik yöntemler (rijit bronkoskopi, terapötik bronskopi tekbikleri gibi) olarak sınıflandırılabilmektedir. Günümüzde ülkemizde tıpta uzmanlık eğitiminde yetkinlik temelli eğitim benimsenmiştir. Çekirdek eğitim müfredatı ve minimum standartlar tanımlanmıştır. Bu çalışmada göğüs hastalıkları hekimlerinin bronkoskopi yetkinliklerini, bunu etkileyebilecek değişkenleri ve eğitim gereksinimlerini belirlemeyi amaçladık.*

Yöntem: *Uzman hekimlere elektronik ortamda bir anket uygulandı. Anket formu, asistanlıkları sırasında ve sonrasında eğitim ortam ve olanakları, katıldığı veya kendisinin uyguladığı işlem sayıları gibi nitel ve nicel soruları içeriyordu. Birinci kademe yetkinlikler olarak anatomi bilgisi, mukozal değerlendirme, el manevraları, bükülebilir bronkoskopi uygulayabilme, endobronşial forceps gibi 11 temel; yabancı cisim çıkarma, rijit bronkoskopi gibi 8 ikinci kademe beceriye dair yetkinlik öz-değerlendirmelerinden elde edilen veriler MSExcel ve SPSS programları ile analiz edildi.*

Bulgular: *Toplam 29 göğüs hastalıkları uzmanının (14 kadın, 15 erkek) yaş ortalaması 43.8 ± 6.9 yıldı. Uzman oldukları yıllar 1999 ile 2017 yılları arasında değişiyordu ve ortanca 2008 idi.*

Öz-değerlendirme sonuçlarına göre uzmanlık eğitiminin sonunda hekimlerin bronkoskopi yetkinlikleri %7-76 arasında idi. Uzman hekim olarak çalışıldığı süre boyunca anlamlı olmayan bir gelişme vardı (%14-86). Uzmanlık eğitiminin sonunda ileri bronkoskopist yetkinlikleri %28-72 idi. Anlamlı gelişmeler ise sadece EBUS, EBUS-FNA ve APC yetkinliklerinde vardı.

Sonuç: *Göğüs hastalıkları uzmanlarının temel bronkoskopist yetkinliklerinin yeterli düzeyde olmadığı değerlendirilmiştir. Bu çalışmada elde edilen sonuçlar, yetkinlik temelli eğitime ihtiyacı destekler niteliktedir. Bu çalışma aynı zamanda mezuniyet sonrası sürekli mesleki gelişime de daha fazla önem verilmesi gerektiğini vurgulamaktadır.*

INTRODUCTION

In Turkey, basic bronchoscopy training is part of the chest diseases specialty training. The general method of training bronchoscopists has been a time- and number-based master-apprentice training model. A bronchoscopist is a physician who is competent to use knowledge, personal, social and/or methodological skills in bronchoscopic interventions (1). According to Turkish Higher Education Qualifications Framework, competence is the ability to use knowledge, personal, social and/or methodological skills on the job and the work environment as well as professional and personal development (2). In Turkey, competency- based education (within the framework of Miller's competence model) has been adopted to clinical training in specialties and a core curriculum has been created for each specialty by the Medical Specialty Board/Council Specialization Board Curriculum Development and Standard Setting System in Medicine (TUKMOS) (3).

In the training model based on competency or outcome, the student progresses in his studies by acquiring the entire measurable skills defined as competence. The time required for acquisitions may vary depending on the candidate. The defined competencies are teached in detail and evaluated by the trainer. In such an education model, greater responsibilities fall on educators and institutions (4).

According to TUKMOS, four levels are defined for bronchoscopist competencies (3): i) have knowledge about how the bronchoscopic intervention is performed and elaborate on this subject when necessary; ii) perform bronchoscopic intervention in an emergency,

with guidance or instruction or under supervision and control; iii) apply bronchoscopic intervention in uncomplicated, common cases; iv) apply bronchoscopic intervention in all cases, whether complex or not.

It is suggested that the competencies to be acquired in TUKMOS should be addressed at two levels (1st and 2nd level seniority). The first seniority competencies are the competencies that should be prioritized in the training process and are the competencies required to solve clinical problems with high mortality, morbidity and prevalence/incidence, and the frequently applied and uncomplicated interventional competencies. The bronchoscopic procedures which should be trained on at the 1st seniority and level 4 can be defined as basic or minimum bronchoscopic procedures, and the bronchoscopic interventions with minimum level 1 training standards at the 2nd seniority are defined as advanced bronchoscopic procedures or development standards. For example, methods such as endobronchial ultrasonography (EBUS), therapeutic bronchoscopy, newly developing methods such as electromagnetic navigation and alveoloscopy are advanced bronchoscopic procedures (5).

In this study, we aimed to determine the self-assessment of bronchoscopist competencies of pulmonologists who were trained in one and the same university clinic for about 20 years.

METHODS

In this study, self-assesments of specialist physicians were taken by questionnaire on electronic environment, and the achievement rate of the standard goals of training is examined.

The bronchoscopist competencies are determined by taking into consideration the TGHYK, Hermes and Bronchoscopy International standards. The competence self-assessments were asked separately for the assistantship period and the specialty period in the form of 0-4 level skill assessment at the determined by TUKMOS.

After the bronchoscopist competencies were determined, the following questions were asked as the variables that could affect the competency during training: age, pre-university high school education (whether it is a technical high school or not), the medical school and year of graduation, the prior knowledge on bronchoscopy, the period of specialty training received, average number of days per month spent on bronchoscopy during assistantship, the total number of procedures s/he observed/assisted, the total number of procedures s/he personally performed, the number of different faculty members s/he had the opportunity to receive bronchoscopy training, the equipment and facilities which were available in the bronchoscopy laboratory during assistantship period, if s/he experienced any personal challenges (physical, skills training, administrative, psychological, etc.) during assistantship that would affect the bronchoscopy training, if s/he attended any bronchoscopy training courses during the assistantship and its details, if s/he had the opportunity to work on any model or bronchoscopy simulator during assistantship, his assessment on the quality of the bronchoscopy training s/he received during assistantship, his suggestions about the bronchoscopy training s/he received during assistantship; the total number of procedures s/he observed/assisted or personally performed during assistantship; bronchoscopy facilities in the institutions where s/he worked after becoming a specialist, and the information on the number and duration of the procedure s/he performed personally.

In order to evaluate their professional development after becoming specialist, the following questions were asked: if s/he had access to bronchoscopy and related devices in the institutions where s/he worked, the average and total number of procedures per month s/he

personally performed, if s/he attended any bronchoscopy course, any opportunity s/he had to work on any model or bronchoscopy simulator after becoming a specialist, his opinion and suggestions on the bronchoscopy training provided in the institution s/he received training and in other similar training clinics in our country.

After obtaining the consents of the participants who participated in the study, the questionnaire forms were sent, and the completed questionnaire forms were collected on electronic environment. The questionnaires were sent to and collected from participants from November through December 2019.

No sample was taken in the study since the objective was to reach the whole population (minimum 80%).

The criteria including the volunteers in the study were being a pulmonologist from Trakya University Faculty of Medicine, the ages of 25 to 65 and being in an active professional life. Voluntary feedback was obtained from a total of 29/34 pulmonologists.

The data obtained in the study was analyzed by statistical MSExcel and SPSS programs. The frequency distribution, percentage, Mann Whitney U test, chi-square test, Mc Nemar test, and Spearman correlation analysis were used to evaluate the data. The open-ended questions were subjected to qualitative analysis.

Ethics committee approval was received from Trakya University Faculty of Medicine Scientific Research Ethics Committee (Decision No: 14/13, Date: 02.09.2019).

RESULTS

Of the physicians participating in the study, 14 were women, 15 were men, with an average age of 43.8 ± 6.9. The average age of men and women was 46 and 42, respectively. The specialization completion years ranged from 1999 to 2017, with a median of 2008.

When the self-assessments of the diagnostic bronchoscopy competence are examined according to the minimum standards of TUKMOS, the graduate competencies at the end of the residency training are as follows: 76% can recognize and define bronchial anatomy, 52% can recognize-define bronchial mucosa abnormalities, 55% can recognize-define secretions and other bronchial abnormalities, 66% can perform the necessary maneuvers with flexible bronchoscopy (FOB), 62% can perform FOB, 52% can conduct endobronchial biopsy with FOB-forceps, 17% can perform FOB-transbronchial biopsy, 69% can conduct FOB-brush biopsy, 66% could perform FOB-bronchial lavage (BL), 48% can perform FOB-bronchoalveolar lavage (BAL) and 7% can perform FOB-transbronchial needle aspiration biopsy (Figure 1). It was determined that there was an improvement in bronchoscopic competencies after the specialized in chest medicine, but these improvements were not statistically significant (Figure 1).

When the self-assessments of competencies related to advanced bronchoscopic procedures at the time of graduation are as follows: foreign body removal – 48%, EBUS – 38%, EBUS needle biopsy- 38%, rigid bronchoscopy – 72%, electrocautery use competence – 66%, Argon plasma coagulation – 31%, cryotherapy – 28%, and minimum one therapeutic bronchoscopic intervention competence was 66% (Figure 2).

Based on the review of the competencies acquired at the end of the training years vs. the current competencies, the improvement in the EBUS, EBUS-FNA and APC competencies are statistically significant *(McNemar test $p<0.05$)*, and the change in the other competencies are not significant.

Based on the review of the possible variables affecting competencies acquired during assistantship (age, pre-university high school education (whether it is a technical high school), medical school and year of graduation, prior knowledge on bronchoscopy, time period of specialist training, average number of days spent per month on bronchoscopy duration during assistantship, the number of different

faculty members s/he had the opportunity to receive bronchoscopy training, the equipment and facilities which were available in the bronchoscopy laboratory during assistantship period, if s/he experienced any personal challenges (physical, skills training, administrative, psychological, etc.) during assistantship that would affect the bronchoscopy training, if s/he attended any bronchoscopy training during the assistantship and its details, if s/he had the opportunity to work on any model or bronchoscopy simulator during assistantship, his assessment on the quality of the bronchoscopy training s/he received during assistantship, her/his suggestions about the bronchoscopy training s/he received during assistantship, the total number of procedures s/he observed/assisted or personally performed during assistantship:

- There is no significant difference between diagnostic or therapeutic bronchoscopic competence due to gender, age, pre-university high school education (whether it is a technical high school or not), medical school and year of graduation, prior knowledge on bronchoscopy, time period of specialist training, participation in any bronchoscopy training during assistantship and its details, if s/he had the opportunity to work on any model or bronchoscopy simulator during assistantship.

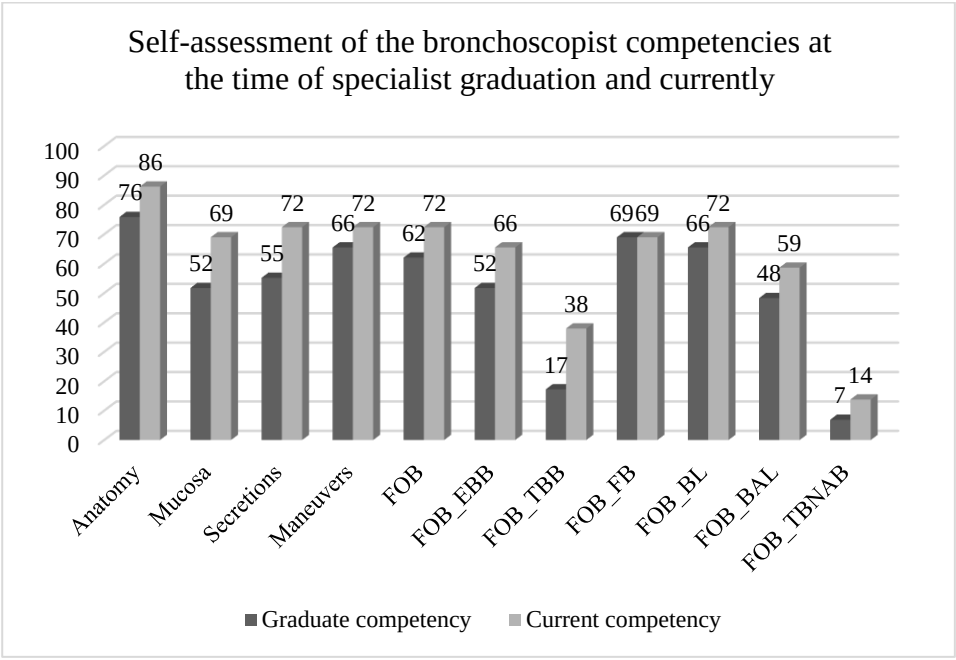

Figure 1. Self-Assessment of Basic – First Level in Seniority - Bronchoscopist Competencies at The Time of Specialist Graduation and Current Practice of The Pulmonology Specialists

**Anatomy: Able to define bronchial anatomy, mucosa: able to describe mucosal changes; secretions: able to describe secretions; maneuvers: able to manipulate the scope into the bronchial tree; FOB: able to perform flexible bronchoscopy; FOB_EBB: able to perform endobronchial forceps biopsy with FOB; FOB_TBB: able to perform transbronchial parenchymal biopsy with FOB, FOB_FB: able to perform bronchial brush with FOB; FOB_BL: able to perform bronchial lavage with FOB, FOB_BAL: able to perform bronchoalveolar lavage with FOB; FOB_TBİAB: able to perform transbronchial needle aspiration with FOB (Using the McNemar test, no significant difference was found between each competency when they became specialists and now and the Diagnostic Bronchoscopy competencies when they graduated and now).*

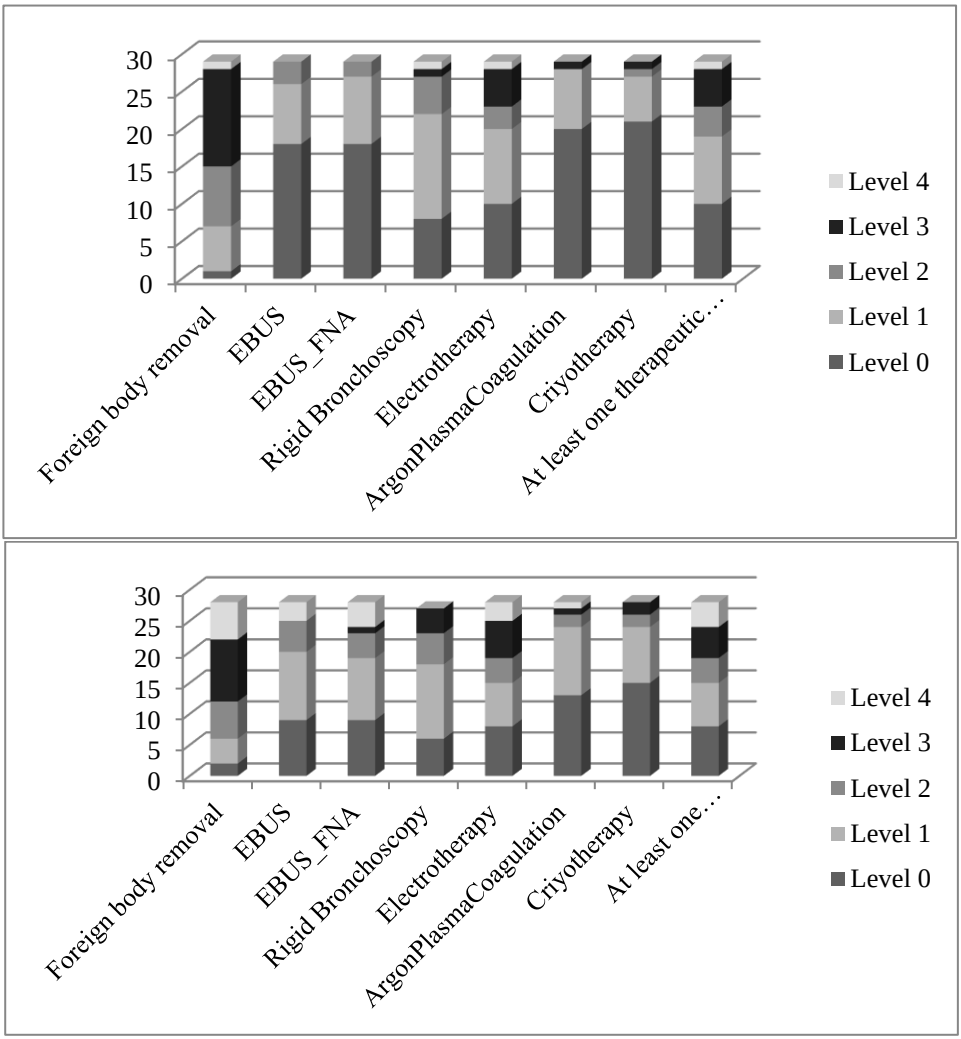

Figure 2. Evaluation of Self-Assessments Regarding The Procedural Skills/Competencies of TUKMOS- Self-Assessment of 2nd Level Seniority Bronchoscopist Competencies at The Time of Specialist Graduation (upper-sided) and Current Practice (bottom-sided) of The Pulmonologists

**Foreign body removal: able to remove bronchial foreign body with a bronchoscope; EBUS: able to perform endobronchial Ultrasonography; EBUS_FNA: able to take fine needle aspiration biopsy with EBUS; RJTB: able to perform rigit bronchoscopy, Electrocautery: able to perform electrocautery with bronchoscopy; APC: Able to perform argon-plasma coagulation with bronchoscopy; Cryo: able to perform cryotherapy with bronchoscopy; At least one: able to perform at least one the bronchoscopic tecniques like electrocoagulation, cryoterapy etc.*

Based on the review of the relationship between each competence and the number of different faculty members s/he had the opportunity to receive bronchoscopy training, average number of days per month spent on bronchoscopy during entire

assistantship period, and the number of procedures performed during the assistantship:

- The relationship with electrocautery (p=0,005, Mann-Whitney U= 38,000); Argon plasma coagulation (p=0,001, Mann-Whitney U= 26,500); cryotherapy (p=0,010; Mann-Whitney U= 34,500); at least one therapeutic bronchoscopic competence (p=0,005; Mann-Whitney U=38,000); the number of faculty members who provided training is found significant. As the number of faculty members increased, the skill levels improved.
- The competence to recognize and define bronchial mucosa abnormalities was significantly associated with the total number of flexible bronchoscopies (FOB) s/he observed/assisted (p=0,008; Mann-Whitney U= 40,500).
- The competence to recognize and define secretions and other bronchial abnormalities was significantly associated with the total number of flexible bronchoscopies (FOB) s/he observed/assisted (p= 0,024; Mann-Whitney U= 47,500).
- The competence to perform endobronchial biopsy with FOB-forceps was significantly associated with the total number of FOB-forceps and endobronchial biopsy procedures s/he observed/assisted (p=0,043; Mann-Whitney U= 49,000).
- The competence to perform electrocautery was associated with the total number of electrocautery procedures s/he observed/assisted (p=0,002; Mann-Whitney U= 16,000). It was determined that there is a significant relationship with the total number of electrocautery s/he observed/assisted by those with at least one therapeutic competence. (p=0,002; Mann-Whitney U= 16,000).
- There is a significant relationship between experiencing personal difficulties that would affect the bronchoscopy training during assistantship and the competence to take BAL with flexible bronchoscopy (FOB) (p= 0,023, X2 = 5,179).
- There is a significant relationship between experiencing personal difficulties that would affect the bronchoscopy training during assistantship and the competence to perform Diagnostic Endobronchial Ultrasonography (EBUS) (konvex prob) (p= 0,036; X2 = 4,398).
- There is a significant relationship between experiencing personal difficulties that would affect the bronchoscopy training during assistantship and the competence to perform cryotherapy (p= 0,045; X2= 4,035).
- There is a significant and positive correlation between the number of faculty members and the competence to perform argon plasma coagulation, to perform cryotherapy, and to perform at least one therapeutic competence (r= 0,422; p= 0,023; r= 0,617; p= 0,000; r= 0,439, p= 0,017).
- There is no correlation between the age of starting the assistantship and bronchoscopic skill levels.
- There is a high level of positive significant correlation between basic bronchoscopic technical knowledge and ability to perform basic FOB and the advanced diagnostic procedures with FOB.

Based on the examination of the relation between the device park and training:

- When there is the opportunity of videbronchoscopy, the possibility of acquiring skills at the level of 3-4 increased.
- The relationship between accessibility to the EBUS device and the competence to perform EBUS acquired at the end of the training is significant.
- The relationship between the accessibility to the EBUS device and the competence to perform TBNA by the EBUS acquired at the end of the training is significant.

No significant relationship is found between the scores of evaluation of the self-assessment of competencies after becoming a specialist and

whether not s/he had access to bronchoscopy devices where s/he is employed, monthly average and total number of procedures s/he personally performed, whether s/he has attended any bronchoscopy course, the opportunity to work on any model or bronchoscopy simulator after becoming a specialist, and the opinions and suggestions about bronchoscopy training given in the institution where s/he undergone? received specialty training and other similar training centers/units? in our country.

How could the bronchoscopy training you received during your assistantship be better? One of the answers given to the question:

"I am of the opinion that a systematic theoretical training for FOB, rigid bronchoscopy and EBUS, practical training on a model or simulator and increasing our own practice under the supervision of an instructor would be beneficial."

Opinions and recommendatitons on bronchoscopy training:

"It would be better if we had a model or simulator and had a more rigid bronchoscopy experience."

"First, on the model should be worked. The number of cases we do on our own should be more. The number of specific procedures should increase and there should be a variety of cases where bronchoscopy is performed."

DISCUSSION

According to the self-assessment results, basic bronchoscopist competencies were 7-76 % at the end of the specialty training. There was an insignificant improvement (14-86 %) throughout working as a specialist doctor. Advanced bronchoscopist competencies were 28-72 % at the end of the specialty training. There were some significant improvements only in the endobronchial ultrasonography (EBUS), endobronchial ultrasonographic fine needle aspiration (EBUS-FNA) and argon plasma coagulation competencies (APC) throughout working as a specialist doctor. The results obtained in this study prove the need for more effective implementation of competencies in bronchoscopy training/education, at least in our educational institution. It can also be evaluated that the discussion about the training based on practical skills in daily practice should be improved increase. This study also highlights the need for giving more importance to continuous professional development (CPD) after graduation.

Subjects as increasing shortening of the training hours in residency training and increasing concerns about patient safety require making sure that the training of residents is competent (6). The competency based education is student oriented, and based on learning by doing process and ensures that those who complete the process graduate with minimum necessary knowledge and skills (7). At the core of competency-based medical education is the requirement that learners demonstrate competence in the application of their learning to patient care (8). Interventional competencies include clinical knowledge, complex cognitive decision making (diagnosis, treatment planning), psychomotor skills (technical/practical skills) and post-operative (postoperative) care (6). Key attributes of a professional skill are good judgement and the ability to make complex decisions. The doctors gaining experience in decision making moderated by external and internal factors where they worked in (8).

The trainings on bronchoscopy competence should be organized on learner oriented approach. Education opportunities suitable for all possible learning styles should be provided. E-learning, theoretical courses, books, case-based evaluations, structured case discussions, hands – on short courses, model/dummy trainings, use of simulators, clinical applied trainings, structured work based learning/work based observation (9, 10). Assessment in competency based medical education includes multiple methods and multiple assessors (11).

When the "decision making" measurement and evaluation process in the examinations performed while completing the specialty training is in the form of performing bronchoscopy in real life, it may involve various risks (6). Work-based assessment and evaluation using direct observation of learners as they provide patient care is a cornerstone of competency-based medical education (12). Evaluation methods such as, Mini-CEX, DOPS, surgical-DOPS, P-MEX, PBA have been used for this purpose. Technical skills can be measured using valid measurement – evaluation tools and check lists (9, 10). Medical skills are mainly assessed by measuring theoretical and practical knowledge, operational skills and professionalism (13). In the evaluation of medical skills, there are evaluation methods according to criteria such as the process efficiency, complication rate and patient comfort in addition to minimum number of procedures, minimum training period. Written exams (open-ended/multiple-choice), the exams consisting of case management questions for the knowledge objectives required for bronchoscopy, mini clinical exam for skill objectives, direct observation of the practice; 360° feedback for attitude objectives, self-assessment, peer assessment, and supervisor evaluations can be used together for (14). The most frequently used measurement and evaluation tool developed for on-the-job measurement of surgical skills is OSATS (Objective Structured Assessment Technical Skills) (6).

Competencies in the bronchoscopic procedures should not be evaluated based on only numbers. There are many variables such as the content of the curriculum and educational and training situations, the characteristics of the trainee and the trainer, and the characteristics of the educational institution (15,16). In some countries such as the UK and Canada, instead of the minimum number of procedures criterion required to evaluate the competence of the trainees, competence in the bronchoscopic procedure is observed and the trainers give their written opinion on whether or not the trainee can perform procedures without supervision (15). Recently, it has been agreed also in the USA that the main criterion should not be the quantities (16).

In the entire training process, the systematic and regular experiences should be planned and structured in line with predetermined competencies and based on existing information/evidence, the experiences should be reflected through constructive and regular feedback given after concrete observations, existing competencies should be restructured and developed in the light of new experiences, and finally, the professional development of the trainees should be planned with the trainer in line with the identified deficiencies, and the development should be improved with independent research and learning activities suitable for this planning (9).

Accreditation is very important in order to ensure that the quality of education is improved in specialty training and to improve the quality continuously. World Federation of Medical Education (WFME) recommends the following set of global standards for postgraduate medical education. The set of standards is structured according to 9 areas with a total of 36 sub--areas, being aware of the complex interactions and links between them. Areas are defined as the broad components to be covered in the process, structure, content, outcomes/competencies, assessment and learning environment of postgraduate medical education and training (17). In Europe, accreditation of specialist training in medicine is performed by the specialization fields qualification boards of the European Union of Medical Specialists (UEMS). In Turkey, qualification boards work on accreditation. The standardization of the specialization training in medicine is ensured by infrastructure review visits made to institutions, determining the core curriculum, use and examination of assistant report cards, implementing qualification exams,

determining the standards and using the accreditation processes (18).

Strenghts and Limitations of the Study

One of the strengths of the study is that the findings obtained from a single clinic have been achieved. Another strength of the study is the fact that the physicians participating in the research answered the questionnaire after graduation, not during their training.

The limitations of the study are as follows: passing of time, personal memory, personal emotions, unstable educational infrastructure in time period, changes experienced in medical education over time.

CONCLUSIONS

In conclusion, it is determined that the bronchoscopist competencies of the physicians were below the standards as a result of the self-assessment of the competencies of the physicians when they became specialists and their current competencies. It was evaluated and accepted by TUKMOS that the content, training and assessment methods should be re-evaluated, number and time-based, master-apprentice relationship-oriented training should be switched to competency-based training. In addition, it should not be forgotten that the context of education and the educational process are at least as important as the output in competence and outcome-based education, and an understanding of process-oriented education should be adopted as much as the output.

It has been evaluated that certification and postgraduate/residency training accreditation, evaluation and examinations as well as the standards for specialty training processes should be expanded in order to increase the quality of training based on competence envisaged by TUKMOS and to increase the quality.

Acknowledgement

The authors wish to express their gratitude to Prof.Dr. Necdet SÜT for help with statistical evaluation.

Conflict of Interest Statement

A.G and C.K have no conflict of interest regarding the manuscript.

Funding Sources

There is no funding.

Author Contributions

A.G has provided substantial contributions to the conception, design of the work, literature review and writing the manuscript. C.K has provided substantial contributions to the conception, design of the work, literature review, interpretation of data, writing the manuscript, and revising it critically and has given final approval of the manuscript.

REFERENCES

1. Karlıkaya C, Türkiye'de Temel Bronkoskopi Eğitimi Standartları. Ilgazlı A, editör. Girişimsel Pulmonoloji. 1.Baskı. Ankara: Türkiye Klinikleri; 2019.p.16-25.

2. TUK. Tıpta Uzmanlık Kurulu Terimler Sözlüğü. Available at: https://dosyamerkez.saglik.gov.tr/Eklenti/13068,karar1026-tukstandartek3-tukterimlerisozlugupdf.pdf?0

3. TC, Sağlık Bakanlığı. Tıpta Uzmanlık Kurulu Müfredat Oluşturma ve Standart Belirleme Sistemi (TUKMOS), Göğüs Hastalıkları Uzmanlık Eğitimi Çekirdek Müfredatı, V.2.3. Ankara; 2017. Available at: https://dosyamerkez.saglik.gov.tr/Eklenti/14476,gogushastaliklarimufredatv21pdf.pdf?0

4. Whitehead CR, Kuper A. Competency-based training for physicians: Are we doing no harm? CMAJ. 2015; 187(4):E128–9. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4347787/

5. Simoff MJ. Learning to Look Through the Bronchoscope. Chest. 2019;148(2):301–3.

Available at: http://dx.doi.org/10.1378/chest.15-0551

6. Kara CO, Özdemir S. Mezuniyet Sonrası Cerrahi Beceri Eğitiminde Ölçme Değerlendirme, Türkiye Klinikleri J Med Educ-Special Topics 2016;1(2):41-6.

7. Söylemezoğlu F, Sökmensüer C, Sungur A, Yeterliğe Dayalı Patoloji Uzmanlık Eğitimi Programı: Hacettepe Üniversitesi Deneyimi), Cilt/Vol. 25, No. 2, 2009; Sayfa/Page 35-40.

8. Paes P, Leat D, Stewart J. Complex Decision Making in Medical Training: Key Internal and External Influences in Developing Practical Wisdom. Medical Education, 2019; 53: 165-174.

9. Gülpınar, MA. Uzmanlık Eğitimi Dönemi ve Çerçeve Eğitim Programı Geliştirme Rehberi, Tıp Eğitimi Dünyası, Nisan 2011.

10. Colt HG. Simulation in bronchoscopy training: are we there yet? Curr Respir Care Rep. 2013;2(1):61–8.

11. Lockyer J, Carraccio C, Chan MK, Hart D, Smee S, Touchie C, Holmboe ES, Frank JR & on behalf of the ICBME Collaborators. Core principles of assessment in competency based medical education, Medical Teacher, 39:6, 609-616, 2017, DOI: 10.1080/0142159X.2017.1315082

12. Iobst WF, Sherbino J, Cate OT, Richardson DL, Dath D, Swing SR, Harris P, Mungroo R, Holmboe ES. & Frank JR & for The International CBME Collaborators, Competency-based medical education in postgraduate medical education, Medical Teacher, 32:8, 651-656, 2010, DOI: 10.3109/0142159X.2010.500709.

13. (UEMS) EU of MS. The European Council for Accreditation of Medical Specialist Qualifications. 2010; (October):1–4. Available at: https://www.uems.eu/__data/assets/pdf_file/0009/1206/ECAMSQ_presentation.pdf

14. TGHYK (Türk Göğüs Hastalıkları Yeterlik Kurulu). Göğüs Hastalıkları Uzmanlık Eğitim Programı. Available at: http://www.tghyk.org/GogusHastUzmEgtProg.pdf

15. Bilaçeroğlu S. Bronkoskopide Eğitim, Yeterlilik ve Sertifikasyon. Içinde: Levent DALAR; Aydın YILMAZ, editör. Tanısal ve Terapötik Bronkoskopi Uzlaşı Raporu. TÜSAD Türkiye Solunum Araştırmaları Derneği; 2017. s. 9–19.

16. Ernst A, Wahidi MM, Read CA, Buckley JD, Addrizzo-Harris DJ, Shah PL, Herth FJF, Parra A de H, Ornelas J, Yarmus L, Silvestri GA. Adult bronchoscopy training: Current state and suggestions for the future: CHEST expert panel report. Chest. 2015;148(2):321–32.

17. WFME Postgraduation Medical Education (PME), WFME Global Standards for Quality Improvement, WFME Office University of Copenhagen, Denmark, 2015.

18. Sayek İ, Tıpta Uzmanlık Eğitiminde Kurumsal Akreditasyon, Türk Tabipleri Birliği Uzmanlık Dernekleri Eşgüdüm Kurulu XII. Tıpta Uzmanlık Eğitimi Kurultayı, Ankara Türk Tabipleri Birliği Yayınları. Birinci Baskı, Kasım 2006.