ORİJİNAL ARAŞTIRMA ORIGINAL RESEARCH

DOI: 10.5336/medsci.2022-90297

Motivation of Specialist Doctors in Türkiye to Conduct Scientific Research: A Descriptive Study

Türkiye'deki Uzman Hekimlerin Bilimsel Araştırma Yapma Motivasyonu: Tanımlayıcı Bir Çalışma

Fatih ÖNER[a], Ümran ÖNER[b], Osman KURT[c], Zeynep Nur İNCEKARA[d]

[a]Department of Otorhinolaryngology, Kastamonu University School of Medicine, Kastamonu, Türkiye
[b]Department of Dermatology, Kastamonu University School of Medicine, Kastamonu, Türkiye
[c]Department of Public Health, Adıyaman Provincial Heath Directorate, Adıyaman, Türkiye
[d]Department of Anesthesiology and Reanimation, University of Health Sciences Başakşehir Çam and Sakura City Hospital, İstanbul, Türkiye

This study was presented as oral at 15th Aegean Dermatology Days, May 11-15, 2022, Fethiye, Türkiye.

ABSTRACT Objective: It is challenging for specialist physicians in Türkiye to carry out scientific research and be productive academically, primarily due to intense working conditions. We aimed to identify the obstacles and challenges physicians face while doing scientific studies and offer solutions. **Material and Methods:** Specialist doctors and assistant professors from all over Türkiye were invited to the study. A questionnaire of 16 questions was directed to the physicians. **Results:** Four hundred one specialists who voluntarily participated in the study were evaluated. The physicians who participated in scientific studies other than their thesis during residency continued academic studies more after becoming specialists (p=0.039). The high daily workload was the most significant obstacle for specialists in medical and surgical sciences (p=0.008). Specialists in basic sciences stated the lack of teamwork and financial support as the critical obstacle they faced (p=0.013, p=0.003). The most challenging step in a study was converting the data into an article for all doctors (41.9%). Those working in the provincial health directorate and its units had the most difficulty in collecting patients/data, while the selection of scientific journals and sending articles were the most significant challenge for the specialists working in their clinic (p=0.027, p=0.001). **Conclusion:** Daily workload, lack of time devoted to scientific research, and lack of financial support are the most critical problems faced by specialists in scientific studies in our country. Solving these problems and establishing scientific study teams under the leadership of experienced lecturers will increase the motivation of specialists in Türkiye.

Keywords: Motivation; research; specialists

ÖZET Amaç: Türkiye'de uzman hekimlerin bilimsel araştırmalar yapması ve akademik olarak verimli olması, öncelikle yoğun çalışma koşulları nedeniyle zordur. Bu çalışmada, hekimlerin bilimsel çalışmalar yaparken karşılaştıkları engelleri ve zorlukları tespit ederek çözüm önerileri sunmayı amaçladık. **Gereç ve Yöntemler:** Türkiye'nin her yerinden uzman doktorlar ve doktor öğretim üyeleri çalışmaya dâhil edildi. Hekimlere 16 soruluk bir anket yöneltildi. **Bulgular:** Çalışmaya gönüllü katılan 401 uzman hekim değerlendirildi. Asistanlık döneminde tezi dışında bilimsel çalışmalara katılan hekimler, uzmanlaştıktan sonra akademik çalışmalarına daha fazla devam etmişlerdir (p=0,039). Günlük iş yükünün fazla olması dahili ve cerrahi bilimlerde çalışan uzman hekimlerin önündeki en önemli engeldi (p=0,008). Temel bilimlerde çalışan hekimler, karşılaştıkları en önemli engel olarak ekip çalışması ve finansal destek eksikliğini belirtmişlerdir (p=0,013, p=0,003). Bir çalışmada, en zorlu adım verileri makaleye dönüştürmekti (%41,9). İl sağlık müdürlüğü ve birimlerinde çalışanlar en çok hasta/veri toplamada zorluk yaşarken, kendi kliniklerinde çalışan hekimler için en önemli zorluk bilimsel dergi seçimi ve makale gönderimiydi (p=0,027, p=0,001). **Sonuç:** Günlük iş yükü, bilimsel araştırmalara ayrılan zamanın azlığı ve maddi destek eksikliği, ülkemizde bilimsel çalışmalarda uzman hekimlerin karşılaştığı en önemli sorunlardır. Bu sorunların çözülmesi ve deneyimli öğretim elemanlarının önderliğinde bilimsel çalışma ekiplerinin kurulması, Türkiye'deki uzmanların motivasyonunu artıracaktır.

Anahtar Kelimeler: Motivasyon; araştırma; uzman hekimler

In our country, physicians usually conduct their educational and scientific studies during non-work times due to the intense daily work pace. Physicians who have a heavy workload and are required to use their non-work time on training and scientific research have difficulty maintaining their academic motivation and productivity. In recent years, there has been an increase in the number of physicians leaving

Correspondence: Ümran ÖNER
Department of Dermatology, Kastamonu University School of Medicine, Kastamonu, Türkiye
E-mail: umran.yildiz9@gmail.com

Peer review under responsibility of Turkiye Klinikleri Journal of Medical Sciences.

Received: 04 Apr 2022 ***Received in revised form:*** 09 Oct 2022 ***Accepted:*** 26 Oct 2022 ***Available online:*** 08 Nov 2022

our country to work in other countries due to unfavorable working circumstances, violence in health, and also the difficulty in earning a living income.[1]

Studies have shown that the workload in residency and the academic tendency of the institution plays an influential role in scholarly productivity.[2,3] A good mentor in the educational process is one of the best chances for physicians.[4] It was observed that the academic productivity of those who participated in scientific studies during residency was higher after specialization.[5,6] In addition, training on scientific publication processes increases the quality of academic studies.[7]

By identifying and reducing the challenges faced by specialists, conducting new scientific studies can be facilitated, and academic motivation can be increased. Studies examining the academic productivity of some departments in our country have been carried out.[8,9] However, we could not find any study that deals with the subject from all sections and reveals the relationship between sections differences, institutions and obstacles. In our study, we aimed to identify the obstacles and challenges faced by specialists while doing scientific studies and to contribute to solutions.

MATERIAL AND METHODS

This study was approved by the Local Ethics Committee of Erzurum Bölge Training and Research Hospital (date: Jun 21, 2021, no: 2021/12-209) and performed according to the Declaration of Helsinki. Between July and November 2021, a cross-sectional, anonymous, and voluntary electronic questionnaire was sent to physicians working as specialists or assistant professors via e-mail and messages all over Türkiye. E-mail, WhatsApp (Meta, Inc., United States of America), and Telegram (Pavel Durov, Russia) groups for hospitals or specialties were used to contact physicians. Four hundred-one specialists who completed their residency in any medical department and voluntarily participated in the 16-question survey were included in the study. The study did not include practitioners, research assistants, associate professors, and professors. The questionnaire contains the following questions:

- Sociodemographic data,
- The field of section (medical sciences/surgical sciences/basic sciences) and institutions of residency (training and research hospital/state university hospital/private university hospital/abroad),
- Duration of work in the specialty,
- Current workplace and position (state hospital/training and research hospital/university hospital/private hospital/clinic/provincial health directorate and its units),
- Trainings of basic and/or advanced good clinical practices, statistics and experimental animals' usage,
- The existence of scientific studies contributed or published during the residency,
- Adequateness of academic incentives for scientific studies,
- Obstacles to making a scientific study and the most challenging step in the process of making/publishing a scientific study.

STATISTICAL ANALYSIS

SPSS 22 (SPSS Inc., Chicago, IL, USA) package program was used for statistical analysis. Chi-square analysis (Pearson chi-square) was used to compare categorical variables between groups. If more than 20% of the expected values were less than 5, the Fisher exact test was considered. The Kolmogorov-Smirnov test evaluated whether the continuous variables fit the normal distribution. In comparisons between the 2 groups, independent samples t-test was applied if the variables fit the normal distribution. The statistical significance level in the analysis was accepted as $p<0.05$.

RESULTS

Our study was carried out with 401 (264 females, 137 males) physicians with a mean age of 37.3±7.0. 85% worked as specialist physicians, 13.7% as assistant professors, and 1.2% as hospital administrators. Detailed information about residency and specialization is given in Table 1.

71.3% of all participants said that excessive workload is the most significant obstacle in doing scientific work. Only 11% of physicians stated that the

TABLE 1: Demographic data of participants and characteristics of scientific studies.

		n	%
Age (Mean±SD)		37.3±7.0	
Gender	Female	264	65.8
	Male	137	34.2
Region	Marmara	129	32.2
	Eastern Anatolia	81	20.2
	Central Anatolia	71	17.7
	Southeast Anatolia	32	8.0
	Aegean	31	7.7
	Black Sea	31	7.7
	Mediterranean	26	6.5
Section	Department of Medical Sciences	270	67.3
	Department of Surgical Sciences	101	25.2
	Basic sciences	30	7.5
Duration of work in the post-specialization	0-5 years	219	54.6
	6-10 years	83	20.7
	11-15 years	47	11.7
	over 15 years	52	13.0
Institution of residency	University hospital (State)	245	61.1
	Training and research hospital	134	33.4
	University hospital (Private)	22	5.5
Current institution	Training and research hospital	143	35.7
	State hospital	122	30.4
	University hospital	52	13.0
	Private hospital	44	11.0
	Provincial health directorate and its units	24	6.0
	Clinic	16	4.0
Title/position	Specialist	341	85.0
	Asistant professor	55	13.7
	Manager/administrator	5	1.2
Does your institution provide sufficient financial encouraging for scientific studies?	Yes	20	5.0
	No	297	74.1
	No idea	84	20.9
Training of basic and/or advanced good clinical practice	Yes	238	59.4
	No	163	40.6
Statistics training	Yes	146	36.4
	No	255	63.6
Certification of experimental animals' usage	Yes	57	14.2
	No	344	85.8
Contribution to any scientific study other than specialization thesis during residency	Yes	285	71.1
	No	116	28.9
Any scientific study you authored during your residency	Yes	262	65.3
	No	139	34.7

SD: Standard deviation.

lack of financial encouragement was an obstacle for the researches (Figure 1). Fifty (12.7%) participants said they did not conduct scientific studies.

41.9% of physicians had difficulty creating an article from the data while conducting a scientific study (Figure 2). Challenges in ethics committee procedures, failure of hospital administrations to create conditions that will encourage academic studies, conflicts of interest with individuals working together, not finding an appropriate subject for study, and in-

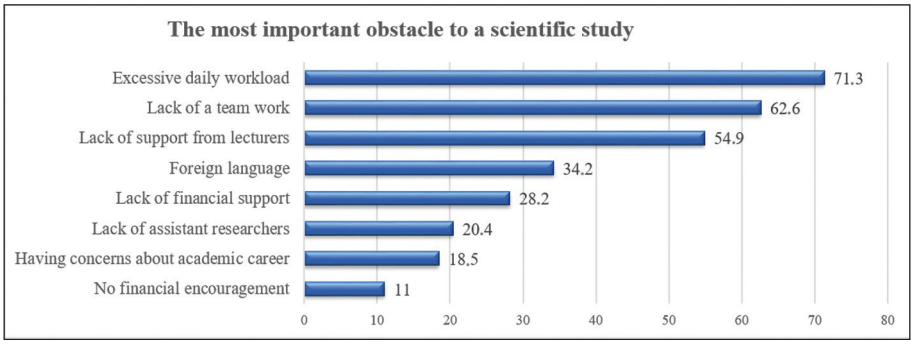

FIGURE 1: Answers to the question which "What do you think about the most important obstacle to a scientific study is?"

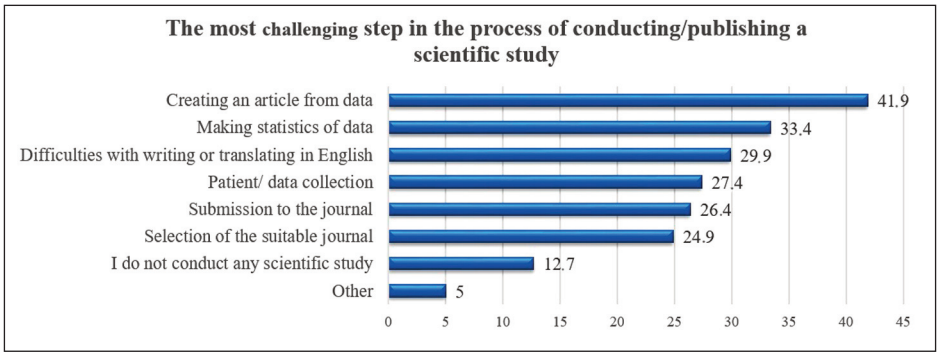

FIGURE 2: Answers to the question which "What do you think about the most challenging step in the process of conducting/publishing a scientific study is?"

ability to find financial support are other problems that physicians stated.

As the participants were evaluated according to age, it was observed that as the age increased, there was less challenge in choosing a journal for submitting a study (p=0.024). There was no significant difference between the other steps in terms of age. However, the mean age of physicians who did not conduct scientific studies was significantly higher than those who did. (p=0.015). The most challenging step for both genders was creating an article from the data. Male physicians stated that they had more challenges during the patient/data collection step, and female physicians said they had more challenges submitting to the journal (p=0.003, p=0.007, respectively).

The physicians were compared according to the regions, and the intense daily workload was the most pressing obstacle for the physicians working in Central Anatolia (84.5%), Black Sea (83.9%), Marmara (75.2%), Mediterranean (69.2%), and Aegean (67.7%). Lack of teamwork was the most important obstacle for the physicians working in Southeastern Anatolia (75%) and Eastern Anatolian (69.1%). There was no significant difference between the regions in terms of primary and/or advanced good clinical practice training, statistics training, and the certification of experimental animals' usage (p>0.05).

As the physicians were compared according to the duration of work in the post-specialization, foreign language was the most important obstacle for physicians working over 15 (p=0.032) years. Lack of teamwork was seen as the more critical obstacle by the physicians working for 11-15 (p=0.022) years. The physicians working for 6-10 years stated that the most crucial challenge was patient/data collection (p=0.022). It has been observed that the rate of not conducting scientific studies is higher in those who work over 15 (p<0.001) years.

EVALUATION OF PHYSICIANS ACCORDING TO THE INSTITUTION OF RESIDENCY

As the physicians were compared according to their institution of residence (training and research hospi-

tals or university hospitals), no significant difference was observed in terms of contributing to the scientific studies and being an author in any publication during residency (both p>0.05, Table 2). Physicians who contributed to a scientific study during their residency were more likely to receive statistical training (p=0.019). Physicians who did not participate in the studies during their residency were also significantly less likely to conduct scientific studies in their specialties (p=0.039). Obstacles and challenges encountered while doing scientific studies were not statistically significant according to the institution of residence.

EVALUATION OF PHYSICIANS ACCORDING TO THEIR SECTION OF SCIENCE

The participants were divided into groups based on their disciplines and the obstacles to conducting scientific studies were analyzed, it is clear that there were significant differences (Table 3). The highest rate of obstacle was stated as the excess of daily workload (73.7% and 72.3%) in medical and surgical sciences, and the lack of team work (80%) in basic sciences. Daily workload was a more significant obstacle for physicians working in medical and surgical sciences than those working in basic sciences (p=0.008). Foreign language was seen as an obstacle in 38.5% of the medical sciences group, 27.7% in the surgical sciences group, and 16.7% in the basic sciences group (p=0.016). In comparison to other sciences, physicians in basic sciences described the absence of financial support as an obstacle at a larger percentage (53.3%, p=0.003). The highest rate (80%) of physicians in basic sciences and the lowest rate (52.5%) of physicians in surgical sciences stated the lack of a team work as an obstacle (p=0.013). It was observed that there was no significant difference between the groups in terms of challenging steps in the process of making or publishing a scientific study.

EVALUATION OF PHYSICIANS ACCORDING TO THE SPECIALIZATION PROCESS

As the physicians were evaluated according to the current institution, no significant difference was

TABLE 2: Comparison of the physicians according to institution of residency.

		University hospital (State) n (%)	Training and research hospital n (%)	University hospital (Private) n (%)	p value*
Contribution to any scientific study other than specialization thesis during residency	Yes	176 (71.8)	90 (67.2)	19 (86.4)	0.168
	No	69 (28.2)	44 (32.8)	3 (13.6)	
Any scientific study you authored during your residency	Yes	160 (65.3)	87 (64.9)	15 (68.2)	0.957
	No	85 (34.7)	47 (35.1)	7 (31.8)	
The most important obstacle to a scientific study					
Foreign language		86 (35.1)	41 (30.6)	10 (45.5)	0.350
Lack of financial support		72 (29.4)	35 (26.1)	6 (27.3)	0.792
Lack of assistant researchers		54 (22.0)	22 (16.4)	6 (27.3)	0.309
Lack of a team work		151 (61.6)	90 (67.2)	10 (45.5)	0.132
No financial gain		30 (12.2)	11 (8.2)	3 (13.6)	0.446
Excessive daily workload		171 (69.8)	98 (73.1)	17 (77.3)	0.646
Lack of support from lecturers		131 (53.5)	80 (59.7)	9 (40.9)	0.203
Having concerns about academic career		43 (17.6)	26 (19.4)	5 (22.7)	0.787
The most challenging step in the process of conducting/publishing a scientific study					
Patient/data collection		76 (31.0)	31 (23.1)	3 (13.6)	0.085
Making statistics of data		89 (36.3)	37 (27.6)	8 (36.4)	0.218
Creating an article from data		93 (38.0)	64 (47.8)	11 (50.0)	0.132
Difficulties with writing or translating in English		72 (29.4)	38 (28.4)	10 (45.5)	0.257
Selection of the suitable journal		61 (24.9)	36 (26.9)	3 (13.6)	0.413
Submission to the journal		71 (29.0)	29 (21.6)	6 (27.3)	0.300
I do not conduct any scientific study		24 (9.8)	23 (17.2)	4 (18.2)	0.088

*Chi-square test.

TABLE 3: Comparison of the obstacles in scientific studies according to the section of science.

	Medical sciences n (%)	Surgical sciences n (%)	Basic sciences n (%)	p value*
Foreign language	104 (38.5)[a]	28 (27.7)[b]	5 (16.7)[a,b]	0.016
Lack of financial support	75 (27.8)[a]	22 (21.8)[a]	16 (53.3)[b]	0.003
Lack of assistant researchers	57 (21.1)	20 (19.8)	5 (16.7)	0.834
Lack of a team work	174 (64.4)[a,b]	53 (52.5)[b]	24 (80.0)[a]	0.013
No financial gain	33 (12.2)	7 (6.9)	4 (13.3)	0.318
Excessive daily workload	199 (73.7)[a]	73 (72.3)[a]	14 (46.7)[b]	0.008
Lack of support from lecturers	155 (57.4)	50 (49.5)	15 (50.0)	0.339
Having concerns about academic career	52 (19.3)	18 (17.8)	4 (13.3)	0.717

a,b: Different letters indicate the statistical difference. *Chi-square test.

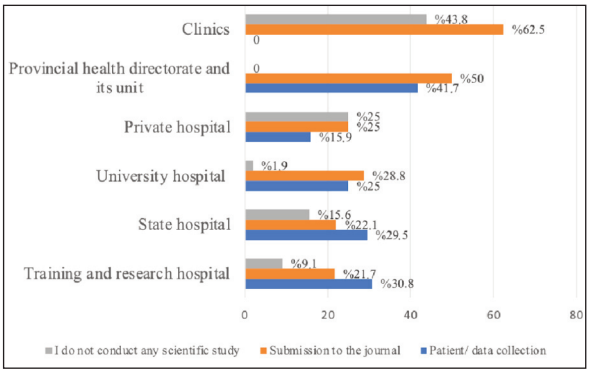

FIGURE 3: Comparison of the obstacles and challenges in scientific studies according to the institutions.

found in terms of the most important obstacle to a scientific study. When the challenging steps in scientific studies were evaluated, significant differences were found between the 2 steps (Figure 3). Collecting patients/data was the more significant challenge for physicians working in institutions within the provincial health directorate (p=0.027). Submitting to the journal was the most significant challenge for physicians working in institutions within the provincial health directorate and those working in their clinics (p=0.001). There was a significant difference between the groups regarding not doing scientific studies (p<0.001). The rate of not conducting scientific studies is the highest (43.8%) among the physicians working in their clinics (Figure 3).

DISCUSSION

For physicians, medical education is an ongoing process that continues until the end of their careers. Almost all physicians wish to specialize in a specialty after graduating from medical school to work in the most appropriate process for their talents and follow current advancements more efficiently.[10] In a study conducted among medical faculty students in Türkiye, it was reported that 98% of the students wanted to continue residency in medicine and 77.5% of them wanted to pursue an academic career.[11] In our study, the physicians stated the goal of an academic career with a higher rate (82.1%). However, considering the possibility that those with academic motivation will be more interested in our survey, it can be inferred that the actual rate may be lower. This study examines the problems experienced by specialist physicians who want to conduct scientific studies in their daily work life and offers various solutions.

The medical literature has been growing and developing with ever-increasing momentum. In our country, physicians interested in following scientific developments closely and conducting new studies have to continue their scientific studies with an excessive workload. Physicians, who have become more accessible as communication skills have been integrated into many parts of life, are caught between their workload and scholarly interests. Long working hours were the most prevalent barrier to academic education in research, including orthopedists (74.5%).[8] Likewise, our study stated that the most important obstacle for physicians to carry out academic studies in all institutions -especially in clinical departments- was the excessive daily workload (74.5%). In some countries, there has been the concept of "devoted time to scientific studies", it was stated that physi-

cians who had dedicated time to research during working had more publications than those who did not.[12] In our country, it is necessary to reduce the daily workload and create "time devoted to research" as a solution to the long-standing problems of physicians.[8,12]

Other significant causes indicated by physicians include the lack of a team atmosphere capable of carrying out the studies and the lack of adequate support from experienced academics. This condition was stated to be more common among physicians who work in the basic sciences. As we look at the obstacles that physicians face in academic life based on their age, we see that young specialists and academics are the ones who struggle the most in deciding which journal to send their articles to. It is feasible to develop working environments where young and experienced academics can support each other to tackle these difficulties. Universities and the ministry can better coordinate in-service training, academic rotations, and clinic visits for young academics. Experienced lecturers may be encouraged to support young physicians from other institutions as needed.

Regardless of the institution where doctors were trained, converting data into papers, making data statistics, and writing/translating in English were the most difficult steps for physicians when performing scientific research. When evaluated by gender, the most challenging step for males and females is converting data into papers. Female specialist physicians said they had more trouble submitting to journals than men. On the other hand, male physicians reported that the steps of patient/data collection were more challenging than females. These challenges may be the inability to receive the necessary training for academic studies and the lack of sufficient time for research.

A study pointed out that specialist physicians and assistant professors did not receive adequate training on scientific research methods in our country, and the necessity of integrating the regulations for this training into the residency process was emphasized.[13] In a study involving thoracic surgery and cardiovascular surgery residents, 32.9% of the participants reported no educational activities in their clinic, and 31.5% did not read any articles.[14] It has been observed that there is a statistically significant increase in the self-confidence of finding an academic position after residency when medical students and residents are provided with training that supports their academic development.[15] On the other hand, in a study conducted by Namdari et al., it was stated that the publications made during the residency are related to the choice of an academic career in the future.[6] Our results also support that physician (71.1%) who participated in any scientific study while they were resident continue their academic careers more in the future (Table 4). In a study involving 120 specialist

TABLE 4: Comparison of the physicians according to their contributions to any scientific study during the residency.

		Yes n (%)	No n (%)	p value*
Contribution to any scientific study other than specialization thesis during residency	Yes	238 (59.4)	24 (6.0)	<0.001
	No	47 (11.7)	92 (22.9)	
Statistics training	Yes	114 (28.4)	32 (8.0)	0.019
	No	171 (42.6)	84 (21.0)	
The most challenging step in the process of conducting/publishing a scientific study				
Patient/data collection		83 (29.1)	27 (23.3)	0.234
Making statistics of data		92 (32.3)	42 (36.2)	0.450
Creating an article from data		119 (41.8)	49 (42.2)	0.929
Difficulties with writing or translating in English		88 (30.9)	32 (27.6)	0.514
Selection of the suitable journal		70 (24.6)	30 (25.9)	0.785
Submission to the journal		78 (27.4)	28 (24.1)	0.506
I do not conduct any scientific study		30 (10.5)	21 (18.1)	0.039

*Chi-square test.

physicians in the Eastern Anatolian Region, the rate of being in a scientific study other than a specialization thesis was meager (16.7%) while they were residents.[16] In our study, 81 specialists from the Eastern Anatolia Region participated, and the rate of contributing to a scientific study except the thesis while they were residents was found to be higher (66.7%) in this region.

In a study evaluating the statistical knowledge competencies of specialists in our country, 91% of the participants reported needing help with statistics. Only 14% of the physicians performed the statistical procedures of their specialty thesis themselves without any support.[17] In a study with the participation of academic dermatologists, it was stated that the most needed step for education and support was making research statistics (78.4%).[18] The statistical proficiency rate was slightly higher among academic pathologists, and it was determined that 35% of them did their statistical studies.[19] In our study, while 36.4% of the experts received statistics training, the rate of those who participated in scientific studies during the residency period was higher. According to our results, we can say that having statistical training is a triggering factor for participating in scientific studies.

Continuous medical education after specialization will support academic studies. Specialists will benefit from scientific activities such as online training, congresses, conferences, practical courses, case discussion meetings, multidisciplinary councils, domestic and international education scholarships, and multi-center studies primarily organized by education clinics or specialty associations. Furthermore, it has been demonstrated that restricting the subject of study after specialization, such as pursuing an upper specialization or a subspecialty, increases academic production.[20]

A few participants (5%) indicated that the encouragement provided for academic studies was adequate. In our study, the minor obstacle to scientific studies (11%) was the lack of financial encouragement for academic studies. Similarly, a study conducted in our country stated that the least frequently chosen reason to pursue an academic life was compensation.[18] Indeed, physicians do not prefer academic careers due to financial income. However, it is not plausible for the physician to make more effort while doing academic studies, spend on time on scientific studies than working hours, and earn a low income.

Our study has some limitations. The sections could not be evaluated separately, and participation from some regions was low. Details related to academic productivity, such as the number of total scientific publications, the number of first-name articles, and in which indexes the articles were published, could not be evaluated.

CONCLUSION

We tried to present the priority problems of specialists in Türkiye. Daily workload, lack of time devoted to scientific research and lack of financial support are the most important problems faced by specialists in scientific research. In the study, we offered some solutions that can improve physicians' working conditions and increase their academic motivation.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Fatih Öner;* ***Design:*** *Fatih Öner, Ümran Öner;* ***Control/Supervision:*** *Fatih Öner, Ümran Öner;* ***Data Collection and/or Processing:*** *Ümran Öner, Osman Kurt, Zeynep Nur İncekara;* ***Analysis and/or Interpretation:*** *Ümran Öner, Osman Kurt, Zeynep Nur İncekara;* ***Literature Review:*** *Ümran Öner, Zeynep Nur İncekara;* ***Writing the Article:*** *Ümran Öner, Osman Kurt, Zeynep Nur İncekara;* ***Critical Review:*** *Fatih Öner, Ümran Öner;* ***References and Fundings:*** *Ümran Öner, Zeynep Nur İncekara.*

REFERENCES

1. The New York Times [Internet]. © 2022 The New York Times Company. [Cited: February 07, 2022]. Turkey's Doctors Are Leaving, the Latest Casualty of Spiraling Inflation. Available from: [Link]
2. Namdari S, Baldwin KD, Weinraub B, Mehta S. Changes in the number of resident publications after inception of the 80-hour work week. Clin Orthop Relat Res. 2010;468(8):2278-83. [Crossref] [PubMed] [PMC]
3. Jean WC, Felbaum DR. Impact of training and practice environment on academic productivity of early career academic neurosurgeons. World Neurosurg. 2019;121:e892-7. [Crossref] [PubMed]
4. Soyer P. Academic productivity. Diagn Interv Imaging. 2016;97(2):139-40. [Crossref] [PubMed]
5. Macknin JB, Brown A, Marcus RE. Does research participation make a difference in residency training? Clin Orthop Relat Res. 2014;472(1):370-6. [Crossref] [PubMed] [PMC]
6. Namdari S, Jani S, Baldwin K, Mehta S. What is the relationship between number of publications during orthopaedic residency and selection of an academic career? J Bone Joint Surg Am. 2013;95(7):e45. [Crossref] [PubMed]
7. Frankel WC, Scott BG, Massarweh NN, Silberfein EJ, Zhang Q, Rosengart TK, et al. A multifaceted research engagement program improved the academic productivity of general surgery residents. J Surg Educ. 2020 ;77(5):1082-7. [Crossref] [PubMed]
8. Demirtaş A, Karadeniz H, Akman YE, Duymuş TM, Çarkcı E, Azboy İ. Academic productivity and obstacles encountered during residency training: A survey among residents in orthopedics and traumatology programs in Turkey. Acta Orthop Traumatol Turc. 2020;54(3):311-9. [Crossref] [PubMed] [PMC]
9. Yakar F, Hanalioglu S, Sahin B, Egemen E, Dere UA, Kiraz İ, et al. Academic performance after neurosurgery residency training in Turkey: a national survey. Neurosurg Focus. 2020;48(3):E8. [Crossref] [PubMed]
10. Taneli B. Türkiye'de pediatri eğitimi ve uzmanlik [Paediatrics education and speciality in Turkey]. Pediatr Res. 2015;2(3):114-7. [Crossref]
11. Yarış F, Topba, M, Çan G, Özoran Y. Karadeniz Teknik Üniversitesi Tıp Fakültesi öğrencilerinin tıp eğitimi hakkındaki düşünceleri [Ideas of the students of Karadeniz Technical University Medical Faculty about medical education]. Ondokuz Mayıs Üniversitesi Tıp Dergisi. 2001;18(4):233-41. [Link]
12. Williams BR, Agel JA, Van Heest AE. Protected time for research during orthopaedic residency correlates with an increased number of resident publications. J Bone Joint Surg Am. 2017;99(13):e73. [Crossref] [PubMed]
13. Saydam MB, Özgülnar N, Darendeliler F. Tipta uzmanlık tezi: tartışılan sürece bir araştırma kapsamında bakış [Medical speciality thesis: contribution to a controversial ıssue with a research study]. J Higher Edu Sci. 2014;4(3):176-81. [Link]
14. Çıtak N, Altaş Ö. Türkiye'deki göğüs cerrahisi ve kalp ve damar cerrahisi uzmanlık öğrencisi gözü ile tıpta uzmanlık eğitimi ve eğitim veren kurumlardaki durum [The perspective of thoracic surgery and cardiovascular surgery residents in Turkey on situation of medical training programs and institutions]. Turk J Thorac Cardiovasc Surg. 2012;20(4):826-34. [Crossref]
15. Mason BS, Landry A, Sánchez JP, Williams VN. How to find an academic position after residency: who, what, when, where, why, and how. MedEdPORTAL. 2018;14:10727. [Crossref] [PubMed] [PMC]
16. Gölboyu BE, Dülgeroğlu O, Ekinci M, Kızıloğlu İ, Sarı E, Karaca BP. Doğu Anadolu Bölgesi'nde ikinci basamak sağlık kuruluşlarında görev yapan uzman hekimlerin sürekli tıp eğitimi faaliyetleri [Continuing medical education activities of specialists working in secondary health care hospitals in Eastern Anatolian Region]. The Journal of Tepecik Education and Research Hospital. 2015;25(3):179-85. [Crossref]
17. Alatlı B, Alatlı T. Uzman hekimlerin istatistiki yeterlilikleri hakkında görüşleri [Opinions of specialist physician about statistics sufficiency]. The World of Medical Education. 2020;19(57):120-38. [Crossref]
18. Solak SS, Salman A. Being an academic dermatologist in Turkey: Young academic dermatologists' perspectives on dermatology. Turkderm. 2021;55(1):34-40. [Crossref]
19. Schmidt RL, Chute DJ, Colbert-Getz JM, Firpo-Betancourt A, James DS, Karp JK, et al. Statistical literacy among academic pathologists: a survey study to gauge knowledge of frequently used statistical tests among trainees and faculty. Arch Pathol Lab Med. 2017;141(2):279-87. [Crossref] [PubMed]
20. Eloy JA, Svider PF, Mauro KM, Setzen M, Baredes S. Impact of fellowship training on research productivity in academic otolaryngology. Laryngoscope. 2012;122(12):2690-4. [Crossref] [PubMed]