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ORIGINAL ARTICLE
ORİJİNAL ARAŞTIRMA

A Questionnaire-Based Study to Evaluate the Benefits of Summer Internships for Anesthesia Technician Intern Training in Turkey: Internship Programme of Anaesthesia Technicians

Türkiye'de Anestezi Teknisyen/Teknikerlerinin Stajyer Eğitimi İçin Yaz Stajının Faydalarının Değerlendirilmesine Yönelik Anket Tabanlı Bir Çalışma: Anestezi Teknisyen/Teknikerlerinin Staj Programı

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ABSTRACT

Aim: Quality training of anesthesia technicians must be high. To provide this crucial high quality, summer internship programs are important. This questionnaire-based study aimed to evaluate the benefits of summer internships for anesthesia technician intern training in Turkey.

Material and Method: The study was approved by the ethical committee. An internet questionnaire on Google docs was formed containing participants' demography data, internship applications and their observations. Finding standard questionnaire to investigate technicians' training is difficult; we create a form to investigate our purpose. The descriptive and cross-sectional study included anesthesia technician students and graduates who did summer internships in Turkiye. Questionnaire was replied by 1,179 technicians.

Results: The average age is 23 ± 4.87 years. 84.4% of the participants are women and 77.8% work for 0-1 year. Only 89.2% of the participants did an internship, and 97.8% thought that a summer internship was necessary. Essentials trainings like intubation (39.1%) and monitoring (15.5%) were never performed by nearly half of the technicians. The preparation of alternative airway devices was the least performed application (0.3%). As other applications were in low percentages, these findings could not be accepted as success.

Conclusion: In literature, to our knowledge, there isn't a standard evaluation scale for anesthesia technician training. Thus, we could not define success or failure of internships precisely. However and because of lacking applications in various percentages, we speculate that it is difficult to explain internships as success. To solve this problem, success criteria and "critical numbers" for "training success" must be validated.

Keywords: Nurse Anesthetists, internship, professional practice

ÖZ

Amaç: Anestezi tekniker/teknisyenlerinin eğitim kalitelileri yüksek olmalıdır. Bu çok önemli yüksek kaliteyi sağlamak için yaz stajı programları önemlidir. Ankete dayalı bu çalışma, Türkiye'de anestezi teknisyeni stajyer eğitimi için yaz stajının faydalarını değerlendirmeyi amaçladı.

Gereç ve Yöntem: Çalışma etik kurul tarafından onaylandı. Katılımcıların demografi verilerini, staj başvurularını ve gözlemlerini içeren Google docs üzerinden internet anketi oluşturulmuştur. Teknisyenlerin eğitimini araştırmak için standart anket bulmak zordur; amacımızı araştırmak için form oluşturduk. Tanımlayıcı ve kesitsel tipteki çalışmaya Türkiye'de yaz stajı yapan anestezi teknisyenliği öğrencileri ve mezunları dahil edilmiştir. Anket 1.079 teknisyen tarafından yanıtlanmıştır.

Bulgular: Yaş ortalaması 23 ± 4,87'dir. Katılımcıların %84,4'ü kadın ve %77,8'i 0-1 yıl çalışıyor. Katılımcıların sadece %89,2'si staj yapmıştı ve %97,8'i yaz stajının gerekli olduğunu düşünmekte. Entübasyon (%39,1) ve monitörizasyon (%15,5) gibi temel eğitimler teknisyenlerin yaklaşık yarısı tarafından hiç uygulanmadı. Alternatif hava yolu cihazlarının hazırlanması en az yapılan uygulama (%0,3) idi. Diğer başvurular düşük oranlarda olduğu için bu bulgular başarı olarak kabul edilememiştir.

Sonuç: Literatürde bilgimize göre anestezi teknisyenliği eğitimi için standart bir değerlendirme ölçeği bulunmamaktadır. Bu nedenle stajların başarısını veya başarısızlığını tam olarak tanımlayamadık. Ancak çeşitli oranlarda eksik uygulama olması nedeniyle stajları başarı olarak açıklamanın zor olduğunu düşünüyoruz. Bu sorunu çözmek için başarı kriterleri ve "eğitim başarısı" için "kritik sayılar" doğrulanmalıdır.

Anahtar Kelimeler: Hemşire Anestezist, anestezi teknisyen/teknikerleri. staj, mesleki uygulama

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INTRODUCTION

Vocational colleges must be one of the practical educational institutions in reaching the knowledge required for professional expectations. These associate degree schools and colleges are educational institutions that train qualified human resources for different business sectors such as health. They play a significant role in developing personal abilities and skills, especially with practical training for health care providers other than doctors.

Vocational associate degree schools of health services have been established in higher education in Turkiye since 1983 (1). Those who graduated from the anesthesia department of health high schools and those who graduated from the anesthesiology associate degree programs of Health Services Vocational Schools are authorized as technical staff assisting the anesthetists in the induction, maintenance, and emergence of anesthesia. (2). All the technical staff is supposed to have sufficient pharmacological knowledge, the ability to use multiple materials, and the management of multiple tasks regarding the vital importance of anesthesia procedures. Also, expectations include it is necessary to have good working in harmony as a team and have a good sense of responsibility (3,4). Internship programs are indispensable to accomplish these goals however, to our knowledge, detailed evaluations of training effectiveness has not been investigated in Turkiye.

This questionnaire-based study aimed to evaluate the benefits of summer internships for anesthesia technician intern training in Turkey.

Also, we aimed to define, if possible, the term "Minimum Number of Practices" as the mean of setting a standard that could be useful throughout the country for consistent training practice.

MATERIAL AND METHOD

Study Design

The study is a descriptive and cross-sectional study. Ethical approval was obtained from the Ethics Commission of our hospital. The questionnaire method was preferred in order to reach all anesthesia staff. Therefore, randomization was based on participations of technicians. The survey form was prepared on "Google docs" form, and the form was reached through social media platforms or e-mail. Design of the study and purpose was described in the introduction section of questionnaire, and highlighted that filling the questionnaire would be accepted as consent to participation of the study. Gender, age, education degree, work time, satisfaction, sufficiency, relevancy factors, night shift internships and working stations were asked. Also applications that they were involved in their internships were asked.

Participation

By making power analysis, a sample group of 382 people is predicted with a confidence interval of 95%, with a margin of error of 0.05. As the study was the very first of its kind, it attracted a lot of attention, so 1123 men and women responded to the call for the questionnaire.

Inclusion-Exclusion Criteria

When participants evaluated, 44 people who were neither anesthesia technicians nor students were excluded. A total of 1079 people were included in the study. There were other exclusion or inclusion criteria.

Data Evaluation and Statistics

There were no standard types of evaluations for anesthesia technicians' training. So, we designed a form that could widely consist the desires of technicians in. As all the participants were in the study, there was no control group. Because of this reason statistic will not meet the need of the study. Also, as there is not any standard evaluation method, comparison with similar studies becomes sophisticated. Therefore the study determined the participants circumstances to be functional data for further studies.

RESULTS

Participants

The distribution of the participants on the sociodemographic structure is shown in (**Table 1**). There were 911 women participated in the survey. Most participants (n=971, (90%)) have associate degrees. Also, most (n=840) are in their first year of the profession.

Table 1. Demography of participants

	n	%
Gender		
Male	168	15.6
Female	911	84.4
Age		
0 - 21 years	509	47.2
22 - 29 years	473	43.8
30 years and above	97	9.0
Profession Education Degree		
Health Vocation School	21	1.9
Associate Degree	971	90.0
Bachelor graduate	82	7.6
Graduate	5	0.5
Work time in profession		
0 - 1 year	840	77.8
2 - 3 years	111	10.3
4 - 5 years	29	2.7
6 years and above	99	9.2

Participant Opinions on Internship

Opinions for summer internship efficacy were demonstrated in (**Table 2**). Most participants (n=963) (89.2%) succeeded in their internship. The satisfaction rate slightly decreases among these participants (84.8%). Training in internships was found insufficient in 46.4%. They primarily defined (52%) that being temporary interns was the main reason for insufficient training.

Unfortunately, 6.2% of them worked on irrelevant sections during the internship.

Table 2. Evaluations of the participants for summer internship

	n	%
Did you satisfy? (n=968)		
Yes	813	84.8
No	145	15.2
Was it sufficient?		
Not replied	17	1.6
Sufficient	316	29.3
Must be longer	731	67.7
Must be shorter	15	1.4
Did you have night shift?		
Not replied	16	1.5
Yes	767	71.1
No	296	27.4
What does summer internship mean to you?		
Getting close to profession	830	76.9
Comparison lectures and practice	798	74.0
Cliche to be graduate	158	14.6
Mandatory in curriculum	173	16.0
Who supervised your internship?		
Anesthesia technicians/technicians	914	84.7
Anesthesia Lecturer	145	13.4
Anesthesia Resident	192	17.8
Anesthesia Consultant	505	46.8
Vocational School Directors or Deputies	87	8.1
Were practices enough in internship? (n=960)		
Sufficient	515	53.6
Not Sufficient	445	46.4
If not sufficient, why?		
Workload	431	39.9
Staffs' behaviors interns as temporary worker	561	52.0
Being ignored	483	44.8
Behaving interns as untrusted staff	519	48.1
Even staff has insufficient practice	86	8.0
Seeing interns as unskilled labor	425	39.4
In which unit you worked?		
Preoperative Preparation Unit	375	34.8
Operating Theatre	925	85.7
Anesthesia stockroom and archives	189	17.5
Postoperative recovery room	469	43.5
Intensive Care Unit	75	7.0
Patient Referral and Transport	68	6.3
Algology	33	3.1
Non-operating room Anesthesia	262	24.3
Emergency and Blue Code Management	94	8.7
Did you work in an irrelevant unit? (n=947)		
Yes	67	6.2
No	880	81.6

Applications Attendances

The number of applications made by the participants during their summer internship is shown in (**Table 3**). There were a significant percentage of participants that did not perform different applications. The group of participants that "Never Did Applications" was remarkable, and 15 to 81 per cents of the total group did not attend those applications (**Table 3**). These applications are all essential to be performed, so the numbers of "never did applications" are discouraging.

DISCUSSION

In this study, efficacy of the training program in our country was investigated. Participants mostly (84.3%) defined the internship training satisfying. However, most of them found internships insufficient (70.7%).Participants also gave details about reasons of insufficiency such as permanent staff behavior against interns (52.0%), being targeted as untrusted person(48.1%). Also, in the study, we investigated attendance of interns to applications. Among 12 applications replies about "Never did" are concerning because the least "never did"s were 17.7% and the most "never did"s were 81.3%. It is hard to conclude these results as training success because of few data, however it could be speculated that individual training is important so we accepted the result discouraging. Anesthesia workload is one of the complex, dynamic and time dependent burdens for its staff (4). In addition to hard conditions, number of anesthetists to succeed all these workload is short. For example, in Ethiopia very few anesthetists are serving in the country compared to total population (3). There are only 258 anesthetists for 80 million populations (3). Anesthetists' shortage forces governments to take precautions (3). As many countries do, the best path to solve this problem is recruiting mid-level educated anesthesia technicians (3). However, in some instances, roles of anesthesia technicians are underestimated, and, even their clinical training hours were not reported as it is done for anesthesiologists (5).

Table-3. Number of summer internship application of participants

Application Name/ n(%)	Never Did	1 -19 applications	20 - 59 applications	60 and above applications
Monitoring	167 (15.5)	145 (13.4)	428 (19.6)	339 (31.4)
Intravenous Catheter	191 (17.7)	445 (41.2)	326 (15.1)	117 (10.8)
General Anesthesia Preparation	176 (16.3)	223 (20.7)	447 (20.2)	233 (21.6)
Regional Anesthesia Preparation	345 (32.0)	375 (34.8)	299 (14.3)	60 (5.6)
Airway Application	266 (24.7)	466 (43.2)	285 (12.4)	92 (8.5)
Mask Ventilation	189 (17.5)	475 (44.0)	304 (13.5)	111 (10.3)
LMA Application	502 (46.5)	458 (42.4)	106 (4.4)	13 (1.2)
Alternative Airway Devices	877 (81.3)	174 (16.1)	25 (1.3)	3 (0.3)
Tracheal Intubation	422 (39.1)	463 (42.9)	144 (7.7)	50 (4.6)
Orogastric Application	537 (49.8)	396 (36.7)	118 (5.3)	28 (2.6)
Infusion Pomp Preparation	523 (48.5)	372 (34.5)	141 (6.7)	43 (4.0)
Suction	260 (24.1)	434 (40.2)	270 (12.5)	115 (10.7)

LMA: Laryngeal Mask Airway

Anesthesia technician training started towards the end of the 1800s (6).In the modern sense, anesthesia technician education started in the 1970s (6). Our country's term anesthesia technician is equivalent to "Anesthesia Nurses" in different countries (7, 8). It is stated that with the curriculum applied at the University of Pittsburgh, anesthesia technicians are given 120 hours of simulation training, at least 800 case training, and more than 2000 hours of training on documents (6). This training is stated to be 36 months (6). Like anesthesia nurses' education programs, anesthesia technicians have education programs usually constructed on a 24-month curriculum. Also, Turkiye's total time for associate degree training is 24 months.

In the evolution of anesthesia technician education, cooperation between professional groups is increasing (9). The increase in morbidity and mortality in perioperative or acute care requirements was why health provider groups cooperate (9). So it is realized that within this period of evolution, the only aim is not to increase knowledge and skills but also to strengthen joint harmonious work (9). As a result, over time, the duties of the anesthesia support units have gained a hybrid feature as both direct patient care and taking the necessary measures to provide anesthesia (10).

The current role of clinical educators is essential training of anesthesia technicians (11). Consequently, internship applications are applied mainly in summer periods, as we do, or various types of time schedules are used for a half-day for one month (9). Studies show that technician trainees who participate in such training benefit from every aspect (9).

However, standardization failures of education and training programs threaten anesthesia technicians. A study stated that there are 22 different education models in Africa (12). In a study completed in 2013 about the education levels of anesthesia technicians, especially in Ethiopia, it was found that the education level was not good (12). A study conducted in China in 2022 stated that there is no standard practice regarding anesthesia technicians (13). It is said that the basis of the training content and duration needs to be clarified (13). For this, it was stated that after the International Federation of Nurse Anesthetists standards were established in China; the Nanjing Health Commission was assigned to standardize education throughout the country (13). In the 10-year study conducted with this method, it was stated that although anesthesia technician practices have progressed, a significant number of anesthesia technicians need new training (13).

In our country, according to the law named "Regulation on Principles and Procedures Regarding Practices and Internships," it is determined as "The internship period will start at the beginning of July and continue for a minimum of 30 and a maximum of 60 working days as a summer internship". However, in the Turkish Republic Presidential Internship Mobilization Implementation Directive, it is recommended that the internship period be at least twenty working days within the scope of the internship mobilization project. In the practices of universities, it is seen that different periods are applied especially after the COVID-19 Pandemic. Similar to our curriculum, it was reported that some other summer internship was completed in 30 days (14).

In the literature, efficacy assessments of internship curricula are few. The reason for rare reports might be because of used terms like "other health personnel," which meant that there were no specific determinations for professional branches and evaluating health providers, including anesthesia technicians, under a simple name. In this study, we specifically studied anesthesia technicians.

We found that most anesthesia technicians participate in the summer internship practice. Although summer internship is compulsory to graduate from the vocational school of health, face-to-face training was suspended due to the COVID-19 Pandemic in 2021 and many practical pieces of training, including internships, were discontinuous. For this reason, universities performed document training instead of internship requirements. In our study, participants had their internships not suspended.

The question for the necessity of an internship responded as "Necessary" in our study, as in the literature (14-16). Internship training is an essential practice for students to have the opportunity to practice. Clinical experiences have essential effects on the awareness of anesthesia technicians, critical thinking, psychomotor efficiency, and professionalism (17). When there is compliance with Clinical trainers, education is satisfactory. Still, problems such as non-continuous feedback and evaluation, indifference, poor perception of education skills, limited perception of education, inappropriate communication, and intimidation reduce the quality of education (17). Attitudes of clinical educators were found to be very important for forming students' educational experiences (17). What is expected from anesthesia technician students is not only to learn skills related to their profession but also to produce solutions to professional and ethical problems and uncertainties in areas such as the operating room (18). In terms of many anesthesia technician students, unethical behavior and lack of cooperation in the operating room were described as lacking moral trust (18). The training should be carried out in the determined equipped to service, school, or work environments (10).

In our study, the questionnaire also asked about the presence of "night shift" in summer internships. Two-thirds of them responded with "Yes." Most participants found shifts useful, and this entity is an expected

parameter. This may be because they can practice more. After all, there are fewer health personnel on night shifts.

The vast majority of respondents wrote that they had been satisfied with their internship program. Most of them stated the meaning of a summer internship as "Getting to know the profession closely," and a few stated it as "a formality to graduate." In contrast to these statements, nearly half of the participants stated that the information provided during the internship was insufficient, which could be considered unsatisfactory. Also, it was stated that the reason for this is the temporary workings of interns. Kepekci et al., when asked about the training of anesthesia technicians/technicians in their study with anesthesiologists, 60.6% of them reported that their training was insufficient (19). There is an inability to acquire sufficient skills due to inadequate practice in vocational schools. In the study of Delibaş L. et al., "lack of trust in interns" was stated as the reason for insufficient knowledge (15).

The majority of the participants answered the question about the location of internship as "Operating Room." Few participants did internships in pain rooms where "Algology" procedures, a sub-branch of anesthesia, are performed. Unfortunately, some participants stated that they did internships in places unrelated to anesthesia (blood taking, administrative work, et cetera.) which might be avoided in future practices.

In a study conducted in the USA, the work of anesthesia technicians is mainly in the direction of maintenance and follow-up of anesthesia devices and providing logistic support (20). It is also stated in the study that 67% of anesthesia technicians are responsible for machine maintenance as their primary task, while 35% perform tasks such as blood gas analysis (20). In training, it was stated that the best-learned procedure is executive intubation (12). For this reason, it has been stated that intubation practices on the manikin are related to their behavior (12). For this reason, the importance of doing these practices during internship periods has increased even more. Our study examined the rate of performing the 12 most basic applications in anesthesia during a summer internship. The most applied application was determined as "Monitoring," and the least was determined as "Alternative Airline Vehicle Application." Regular monitoring is the first step to starting anesthesia, and knowledge of monitoring is the cornerstone of anesthesia, so it is the most common practice of all trainees. At the same time, since monitoring is a non-invasive and harmless practice for the patient, it can be quickly done by the interns. However, even in this procedure, there is a discouraging percentage of the "never did" group in our study.

Tracheal intubation and Laryngeal Mask application are anesthesia's most commonly used airway control methods. Anesthesia technicians are mainly at the forefront of airway control. For this reason, the blue code system is usually created by anesthesia staff. Our study determined that almost half of the participants did not perform tracheal intubation and Laryngeal Mask application. These applications are vital since the airway of every patient who is administered general anesthesia must be kept under control. For this reason, the experience gained will help save the lives of many patients in the coming years, as much as possible, to apply in appropriate patients and situations.

With the developing technologies, the devices used in anesthesia are also changing daily. Infusion pumps, which ensure the delivery of liquids and drugs to patients at specified times, are among the most used devices in anesthesia. It has been reported that training is given according to age, anatomical regions, anesthesia methods, and vascular access practices (6). In the USA, while the drug preparation rate was 3%, arterial line placement is performed at a rate of 6% (20). Intravenous access is committed by only 14% of anesthesia technicians (20). However, it was stated that there was an increasing tendency in the evaluated group to take direct action and take responsibility for the patient (20). In our study, nearly half of the participants said they needed to prepare the infusion pump. Especially being close to technological devices and instruments increase the comfort of anesthesia. Therefore, working closely with these devices during internship periods is necessary.

We have limitations on evaluating the trainings of anesthesia technicians. On-the-job training for anesthesiologist is first-level preparation (20). Evaluating the quality of trainings can affect positively the education protocols. Asking trainees if "they liked" the internships, extent of their learning, the performances of trainers and effectively of the organizations will be helpful for policy makers (4). Nevertheless, trainers have deficiencies and differences regarding standardization and consistency of training processes (11). The most important reason for this is the problems related to the definition and standardization of the training items used(11). In order to provide this goal, councils and accreditation boards were usually established (11). These aforementioned insufficiencies are all present in our country.

-. Also formal education, however, is an education that requires time and resources and can always allow mistakes to be made (10). Another that has to be taken into account is preparing students for emotional, physical and psychological stresses (8). These factors were not evaluated which limited the studyfor basic problems in all over the world that has to be solved.

Also, there are rare studies evaluating education qualities. Therefore, we could not be able to compare our country circumstances with others. There are

studies, as mentioned in the manuscript, defining needs for anesthesia technician for countries but these studies did not fully cover our aim.

CONCLUSION

For students in Vocational Schools of Health, the most effective way to get to know the field and learn about their future profession is to do summer internships. When training programs were evaluated disappointing results could come up. In our country, we monitored training failures in various percentages To minimize non-practicing groups, sharing the objectives of the summer internship planned at the universities with the education supervisors in the institutions where the internship is held and preparing joint plans. It may be provided by increasing internship periods as much as possible, and the number of practicing parameters should be increased.

We, on the other hand, speculated that minimum number of applications during internships should be determined in all Health Vocational Schools in our country because the percentages and numbers of applications were lower than expected, especially for the most important ones. With the forms to be made, a certain standard should be provided. For this purpose, the internship of students who have made a certain number of applications can be considered successful, and the quality of practical training can be increased throughout the country.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of Yozgat Bozok University Ethics Committee (Date: 24.06.2022 Decision No: 34/22).

Informed Consent: Because the study was designed retrospectively, no written informed consent form was obtained from patients.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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