The Knowledge Levels of Emergency Physicians: Whom to Care About? Physicians or Patients?

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Abstract

Objective: Emergency physicians, with their life-saving roles in critical diseases' initial evaluation, are essential for patient safety within the health system. The aim of the study is to evaluate whether the practitioners working in the ER and expert physicians (in disciplines other than emergency medicine) consider themselves competent regarding the frequent life-threatening diseases that are encountered and the accuracy of their notions.

Material and Methods: A survey of 20 questions was given to ER physicians working in hospitals.

Results: Of the physicians that took the survey, 82.7% considered their knowledge regarding the initial treatment of a patient admitted to the ER as sufficient or very sufficient; 65.3% of the physicians stated that four or less symptoms that would raise suspicion in an EKG of patients admitted to the ER with myocardial infarction, while 34.7% stated that there may be five or more symptoms. Additionally, 53.8% of the physicians consider themselves competent/very competent in recognizing bleeding and ischemia in brain tomography. Furthermore, 81.6% of the physicians considered their ability to apply initial treatment to a patient with diabetic ketoacidosis as sufficient or very sufficient, while the percentage of physicians who stated that the fluid deficit of a patient with diabetic ketoacidosis is 5 L or more was 55.4%

Conclusion: With this study, we found evidence indicating a serious lack of knowledge among practitioners treating patients in the ER and expert physicians not related to emergency medicine regarding crucial matters related to patients admitted to the ER. *(JAEM 2014; 13: 187-93)*

Key words: Emergency department, emergency medical training, level of knowledge of medical doctors

Introduction

Emergency medicine is a medical specialty that the patients, who apply to the hospital for unexpected diseases and injuries, are diagnosed and treatened medically and interventionally. The basic characteristics of this medical specialty are patient-centered, punctual, reliable, fair, productive and effective (1). Emergency physicians must have unprecedented knowledge and the ability to apply the knowledge rapidly. Emergency physicians must administer treatment by seeing surgical and medical treatment, life threatening clinic and insignificant clinic, adult patient and child patient simultaneously (2). Moreover, this complicated group of patients apply to the emergency departmentfor indistinguishable symptoms (1). Making diagnosis gets difficult because of the insufficient diagnostic facilities, knowing the medical history of the patient in advance rarely, lack of opportunity to reach the registrations most of the time and limited time (3). Having no chance to make a second evaluation, the mistakes of emergency physicians, who have no chance to make a second evaluation, have serious results (3). Because of the low feedback rates, emergency physicians cannot get sufficient information about the operations they made.

All these situations make the emergency physicians, who are life saving in initial assessment of the critical clinical problems and trauma maintenance, one of the essential points of the patient safety in healthcare system (1).

Even if most of the mistakes do not cause serious health problems, they often cause patient dissatisfaction. However, patient satisfaction is an important issue in health care service. One of the factors constituting patient satisfaction in emergency departmentis attitude and skill level including maintenance level of the staff providing service (4).

Public hospitals endeavor to be preferable in the process of restructuring of the healthcare system in Turkey. The most important issue determining the hospital choice is satisfaction level. This satisfaction occurs as a result of positive and negative opinions that the patients hear from the circle of family and friends in addition to their own experiences (4). Unfortunately, the most part of the patients ap-

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Table 1. Special curriculum about frequent diseases which are advised to be known by the emergency physicians (17)

COMMON OBJECTS OF RESUSCITATION: Resuscitation and airway management,cardiac arrest and periarrest, shock and all types of it, coma. ANESTHESIA AND PAIN MANAGEMENT Local anesthesic techniques, conscious sedation WOUND CARE Basic wound debridement and care, recognisation and treatment of the infected wounds GENERAL AIMS FOR TRAUMA Major trauma (T), head injury, chest T, abdominal T, spinal injury, maxillofacial T, bones, orthopedic trauma MUSCULOSKELETAL SYSTEM Extremity disorders, back bone and spinal cord diseases VASCULAR EMERGENCIES Arterial extremity threat, deep vein thrombosis ABDOMINAL SITUATIONS Undistinguishable abdominal pain, hematemesis, melena, anal pain and rectal bleeding, diverticulitis, abdominal aorta aneurism UROLOGY Akut Urinary Retention, urinary bladder congestion, nephrolitiasis and colic pain ROMATOLOGY AND IMMUNOLOGY Crystal arthropaty, arthritis, immune disorder, anaphylaxis PERIPHERAL EMERGENCIES Hyperthermia, hypothermia, congelation, exposure to peripheral toxin and intoxication PSYCHIATRY Acute psychosis, depression, personality disorder, acute suicide and killing ideation, substance abuse EYE PROBLEMS Acute conjonctuvitis, acute vision loss, acute eye trauma and globe rupture EAR, NOSE, AND THROAT EMERGENCIES Head and Neck Infections DENTAL EMERGENCIES Dental abscess and fracture	GYNECOLOGIC AND OBSTETRIC EMERGENCIES Pelvic pain, dysfonctionel uterine bleeding, pregnancy, uncomplicated vaginal delivery, CARDIOLOGY Basic electrographic analysis, recognization and basic treatment of the acute myocard infarction, recognization and basic treatment of the life threatening arrhythmia INSPIRATORY EMERGENCIES Airway obstruction, respiratory insufficiency, asthma and COPD, acute pneumothorax, pulmonary embolism NEUROLOGICAL EMERGENCIES Acute Paralysis, peripheric neuropathy, acute mental, migraine, vertigo HEPATIC DISORDERS Acute hepatitis, liver failure, acute cholecytitis and cholangite CHILD WELFARE Symptoms and findings of child abuse, legal rights ONCOLOGIC EMERGENCIES Acute leucemia, neutropenia and neutropenic fever, solid tumor, complications of chemotherapeutic agents SEXUAL DISORDERS Diagnosis and initial treatment for endemic diseases TOXICOLOGY Treatment of acute intoxication ACID BASE AND VENTILATORY DISORDERS Recognisation of acid base disorders initial management of the mechanical ventilation	FLUID ELECTROLYTE DISORDERS Basic principles in fluid applications, dehydratation, hyperkalemia, hyponatremia NEPHROLOGIC Acute renal failure DIABETES AND ENDOCRINE Glucose metabolism disorders, thyrois disorders HEMATOLOGIC EMERGENCIES Anemia, red blood cell function disorder, clotting disorder INFECTION DISORDERS AND SEPSIS Endemic infection disorders, sepsis, epidemic infection disoders and states, cellulite and gangrene DERMATOLOGICAL AND IMMUNOLOGIC EMERGENCIES Definitive diagnosis of pruritus, definitive diagnosis of exfoliative and exanthema diseases, parasitic infections and infestations NEONATOLOGY Neonatal resuscitation, newborn hyperbilirubinemia, dystrophy of newborn, neonatal fever PEDIATRY Basic pediatric resuscitation, endemic childhood infections, fever in the first six months of life, endemic traumatization patterns of children • Triage application and concept, • Chain of communication and command between the hospitals, • Informed consent, • Malpractice, • Reaching the basic medical information, staff-time-information management.

plying to the emergency services do not have the chance to choose the doctors. Another mischance of the emergency department patients is that the emergency staff consists of the young and the people who have low educational and knowledge level (1). For these reasons, compared with other departments, emergency services are the departments that the satisfaction level is low (4). It is the only solution is to increase the knowledge and skill level of the doctors, who provide emergency maintenance, to direct the patient preferences and increase the patient satisfaction.

Emergency physicians must have education in basic subjects and have efficient knowledge. Clinical maintenance, communication, lifelong learning, maintaining fine medical practice, risk management and frequent emergency diseases constitute the content of the education (Table 1) (5).

Emergency physicians, with their life-saving roles in critical diseases' initial evaluation, are essential for patient safety within the health system. The aim of the study is to evaluate whether the practitioners working in the ER and specialist (in disciplines other than emergency medicine) consider themselves competent regarding the frequent life-threatening diseases that are encountered and the accuracy of their notions.

Material and Methods

Ethical approval was received from Dr Lütfi Kırdar Kartal Training Research Hospital "Board of Scientific Research Survey" for this study. A survey of 21 questions was given to ER physicians working in hospitals. Practitioners, specialists (in disciplines other than

Table 2. Working hours of the physicians, Education hours they took, Patient number admitted their infirmary

	Total		Emergency Physician		Practitioner		Otherexpert physician		Chi-square test
	n	%	n	%	n	%	n	%	P -
How many years have you been emergency physician?									
<=10 years	67	70.5	17	54.8	31	93.9	19	61.3	<.0001*
>10 years	28	29.5	14	45.2	2	6.1	12	38.7	
Education hours you took about terminal illnesses except from medical education?									
<=250 hours	22	40.0	-	-	20	95.2	2	66.7	<.0001**
>250 hours	33	60.0	31	100.0	1	4.8	1	33.3	
What is the average number of the patients admitted to the hospital you work?									
<=300 patients	26	27.4	1	3.22	20	58.8	5	16.7	<.0001*
>300 patients	69	72.6	30	96.8	14	41.2	25	83.3	
* p values are taken from chi-square test. **p valuesare taken from Fisher's Exact test									

emergency medicine) and emergency medicine specialists took the survey.

The physicians who worked at emergency services between 5th April- 30th June 2012 and the physicians who wanted to took our survey are included in the study. Eight emergency physicians took the survey through e-mail. Our survey consisted of 21 questions. At the first part of our survey, there were 9 questions examining to what extent the emergency physicians find their knowledge about some critical diseases that the physicians must know well whether sufficient or insufficient. As the other 8 questions with five options were to compare the knowledge levels of the doctors, 2 questions were to learn emergency medical education level after their graduation, 1 question for their seniority and one question to learn the patient number they saw per a day.

Mentioning the aim of the study, the verbal permission of the physicians, with whom we talked face to face, was received before the survey was taken. It was guaranteed that the answers the physicians had given would not seen by the interviewers and they were wanted to put the surveys they answered in the envelope and give them back by adhering.

Statistical Analysis

In the analysis that practitioners working in the ER and specialist (in disciplines other than emergency medicine) consider themselves competent regarding the frequent life-threatening diseases that are encountered and the accuracy of their notions chi-square test and Fisher's Exact test were used. $p<0.05$ was accepted as statistically significant. Analysis were conducted through the statistic program SPSS 16 (SPSS Inc., Chicago, USA).

Results

Research group consisted of 31 (29.8%) emergency specialists, 39 (37.5%) practitioners and 34 (32.7%) specialist (in disciplines other than emergency medicine). 29.5% of the physicians had been working as emergency departmentphysicians for a long time. 61.5% of the practitioners and 85.3% of the specialist (in disciplines other than emergency medicine) did not receive emergency medical education about terminal illnesses except for general medical education. 40.0 % of the physicians who received education stated that they received emergency medical education for 250 hours and less. There were 300 and more emergency patients applications to the emergency services where 72.6% physicians, who took the survey, worked (Table 2).

Of the physicians that took the survey, 82.7% considered their knowledge regarding the initial treatment of a patient admitted to the ER with heart attack as sufficient or very sufficient. It was tested whether there is a relationship between the ability level of administering treatment to the patients admitted to the ER with myocardial infarction and their area of specialization or not through chi- square test and a statistically significant difference was found between the knowledge levels of emergency physicians, practitioners and the specialist (in disciplines other than emergency medicine) in terms of initial treatment of a patient with a hearth attack (p-value<.0001). While all of the emergency physicians consider themselves as competent or very competent in the initial treatment to myocardial infarction, 89% of the practitioners and 59% of the specialist (in disciplines other than emergency medicine) considered themselves as competent or very competent in the initial treatment to myocardial infarction. All of the emergency specialists considered themselves as sufficient and very sufficient in recognizing ischemia and brady and tachyarrhytmia types. 84% of the practitioners considered themselves as sufficient and very sufficient in recognizing ischemia in EKG, 67% of the practitioners considered themselves as sufficient and very sufficient in recognizing brady and tachyarrhytmia types. 65% of the specialist (in disciplines other than emergency medicine) considered themselves as suficient or very sufficient in recognising ischemia and 56% of them considered themselves as sufficient or very sufficient in recognising brady and tachyarrhytmia types. The relation between the area of specialty and the knowledge level of recognising the brady and tachyarrhytmia types was considered as statistically significant (p value<.0001). 65.3% of the physicians stated that four or less symptoms that would raise suspicion in an EKG of patients admitted to the ER with myocardial infarction and 35% of them stated that there would be five or more symptoms (Table 3).

We asked the physicians about their knowledge level of applying initial treatment to the patient admitted to the emergency departmentwith COPD exacerbation and their knowledge level of making diagnosis on the patients admitted to the emergency de-

Table 3. Answers given to the questions about cardiovascular diseases

	Total		Emergency Physician		Practitioner		Other Expert Physician		Chi-square test
	n	%	n	%	n	%	n	%	P value
Your knowledge level of applying initial treatment to the patient admitted to the emergency department with heart attack?									
Very insufficient/insufficient/I have no idea	18	17.3	-	-	4	10.3	14	41.2	<.0001*
Sufficient/very sufficient	86	82.7	31	100.0	35	89.7	20	58.8	
How many different suspicious symptoms in EKG can be in patients admitted to the emergency department with MI?									
4 and less than 4	66	65.3	8	25.8	31	83.8	27	81.8	<.0001*
5 and more than 5	35	34.7	23	74.2	6	16.2	6	18.2	
Your knowledge level of recognising ischemia in EKG?									
Very insufficient/insufficient/I have no idea	18	17.5	-	-	6	15.8	12	35.3	<.0001*
Sufficient/very sufficient	85	82.5	31	100.0	32	84.2	22	64.7	
Your knowledge level of recognising brady and tachyarrhythmia types in EKG?									
Very insufficient/insufficient/I have no idea	29	27.9	1	3.2	13	33.3	15	44.1	<.0001*
Sufficient/very sufficient	75	72.1	30	96.8	26	66.7	19	55.9	

* p values are taken from chi-square test. **p values are taken from Fisher's Exact test.

partmentwith acute pulmonary tromboembolism. According to the answers we received, the rate of the answers as sufficient and insufficient were respectively 89% and 59%. The physicians' knowledge levels of applying initial treatment to the patient admitted to the emergency departmentwith COPD exacerbation were evaluated according to the area of specialty and the relation was considered as statistically significant (p-value<.0001).

While all the emergency physicians stated that their knowledge level was sufficient or very sufficient in making diagnosis on a patient in such a situation, 95% of the practitioners and 71% of specialist (in disciplines other than emergency medicine) stated that their knowledge levels of applying the initial treatment to the patients admitted to the emergency departmentwith COPD exacerbation. The relation between physicians' knowledge levels of making diagnosis on the patiens admitted to the hospital with acute pulmonary tromboembolism and their areas of specialty was evaluated and the relation between the level of diagnosing on the patient and the medical areas were considered as statistically significant (p-value<0.0001).

It was found that in the patients admitted to the hospital with respirotery disorder, 77% of emergency medical physicians, 33% of specialist (in disciplines other than emergency medicine), and 27% of practitioners thought of five or more diognosis. Among the doctors took the survey, 48% of them consisting completely of practitioners and specialist(in disciplines other than emergency medicine) stated that they did not take blood sample for the arterial blood gas in the last 6 months (Table 4). While the 81.6% of the physicians considered their ability to apply initial treatment to a patient with diabetic ketoacidosis as sufficient or very sufficient, while the percentage of physicians who stated that the fluid deficit of a patient with diabetic ketoacidosis is 5 L or more was 55.4% (Table 5).

In the last 6 months, 47.1% of the doctors did not use rectal touch in examination. They completely consist of practitioners and specialist (in disciplines other than emergency medicine) (Table 6).

Discussion

There are totally 200 hospitals in Istanbul where the survey was taken. According to 2010 data, number of applications to these hospitals was 8 million 132 thousand. According to staff range chart of Ministery of Health of 06.01.2013, there are 16 emergency physician positions in the twelve second-line hospitals of 18 hospitals. Mostly, practitoners and specialist (in disciplines other than emergency medicine) nurse the patitents in the emergency services of second-line hospitals in İstanbul. Especially, there is no emergency physician in these hospitals out of working hours. According to a new study carried out in America, it was found that 2 of 3 problems of the emergency physicians consisting of emergency medical experts and assistants are that not having enough knowledge and not being able to update the available knowledge (6). However, in our study, 61.5% and 83.5% of the physicians did not get additional medical education even in critical diseases. Unfortunately, in spite of the lack of education of high rates, the physicians in our group considered themselves sufficient or very sufficient in treating critical diseases.

Branney and his friends showed that comparing with the physicians who did not get emergency medical education, the physicians who got emergency medical education pay less medical injury compensation (7). The physicians should know their borders and should not avoid geting information from another physician. It should not be forgotten that being a specialist does not stop bringing an action on medical injury (8).

Acute Coronary Syndrom (ACS) is a life threating disease group that is encountered in emergency services frequently. Emergency

Table 4. The answers given to the questions about pneumonopathy

	Total		Emergency Physician		Practitioner		Other Expert Physician		chi-square test
	n	%	n	%	n	%	n	%	P value
Your knowledge level of applying initial treatment to the patient admitted to the emergency departmentwith COPD exacerbation?									
Very insufficient/insufficient/I have no idea	12	11.5	-	-	2	5.2	10	29.4	<.0001**
Sufficient/very sufficient	92	88.5	31	100.0	37	94.8	24	70.6	
The number of terminal illnesses come to your mind in the patient admitted to the emergency departmentwith respiratory disorder?									
4 and less than 4	57	55.9	7	22.6	27	73.0	23	67.6	<.0001*
5 and more than 5	45	44.1	24	77.4	10	27.0	11	32.4	
Your knowledge level of diagnosing on a patient admitted to the hospital with acute pulmonary tromboembolism?									
Very insufficient/insufficient/I have no idea	43	41.3	-	-	21	53.8	22	64.7	<.0001*
Sufficient/very sufficient	61	58.7	31	100.0	18	46.2	12	35.3	
Have you taken arterial blood sample in the last 6 months?									
Yes	53	52.0	31	100.0	13	35.1	9	26.5	<.0001*
No	49	48.0	-	-	24	64.9	25	73.5	

* p values are taken from chi-square test. **p values are taken from Fisher's Exact test.

Table 5. The answers given to the questions about diabetic ketoacidosis

	Total		Emergency Physician		Practitioner		Other Expert Physician		Chi-square test
	n	%	n	%	n	%	n	%	P value
Your knowledge level of applying initial treatment to a patient admitted to the emergency departmentwith diabetic ketoacidosis?									
Very insufficient/insufficient/I have no idea	18	18.4	-	-	6	15.8	12	35.3	0.002*
Sufficient/very sufficient	80	81.6	26	100.0	32	84.2	22	64.7	
What is the expected fluid deficit of a patient weighing 70-80 kilos with diabetic ketoacidosis?									
1-4 L	41	44.6	1	3.2	20	66.7	20	66.7	<.0001*
5-8 L	51	55.4	30	96.8	10	33.3	11	33.3	

* p values are taken from chi-square test. **p values are taken from Fisher's Exact test.

physicians should examine the patients standing to have ACS quickly. It is ideal that when the patient is reached emergency service, EKG with 12 derivation should be applied in 10 minutes. Taking the patient with ACS doubt, normal initial biomarkers and who have no ischemia in EKG under supervision is advised as an effective method (Class I, proof level A). According to AHA 2010 Guideline, some symptoms observed in EKG weigh on MI (9). These symptoms are;

1. New (or probably new) temporal ST segment elevation (1mm and above).
2. New LBBB (estimated as new).
3. T wave inversion in more than one pulmonary derivation.
4. Stable Q wave.
5. 0.5-1mm ST sedimentation (depression).
6. >1mm T wave inversion.
7. Normal EKG.
8. T wave flattenning under 1 mm in derivations with dominant R waves.
9. Derivations with dominant R waves under 1 mm are T wave inversion.

In addition, in the patients in whose EKG atrioventricular block is monitored, MI should come to mind (10). It is delightful that the physicians, took our survey, considered themselves as sufficient in high rates (89.7% of practitioners) in intervention to the heart attack in emergency services. However, these physicians (83.8% of practitioners) know that the findings evoking MI are 4 or less than 4. In other words, only 16.2 of the practitioners who considered themselves as 89.7% sufficient in initial treatment and 18.2% of the specialist (in disciplines other than emergency medicine) stated that the number of findings evoking heart attack in EKG as 5 and more than five. Such state make us think that there are patients who cannot get diagnosis or get late diagnosis.

Gastrointestinal system bleeding is an important medical state of emergency (11). Advanced age, serious comorbid states, hemodynamic instability, esophagial varicosity, serious hematemezis or

Table 6. The answers given tot the questions about GİS Bleeding, Low GKS ve CT

	Total		Emergency Physician		Practitioner		Other Expert Physician		Chi-square test
	n	%	n	%	n	%	n	%	P value
Your knowledge level of applying initial treatment to the patient admitted to the emergency department with GIS bleeding?									
Very insufficient/insufficient/I have no idea	45	43.7	-	-	20	52.6	25	73.5	<.0001*
Sufficient/very sufficient	58	56.3	31	100.0	18	47.4	9	26.5	
Have you made rectal touch in examination in the last 6 months?									
Yes	55	52.9	31	100.0	13	33.3	11	32.4	<.0001*
No	49	47.1	-	-	26	66.7	23	67.6	
Your knowledge level of applying initial treatment to a patient with GKS<8?									
Very insufficient/insufficient/I have no idea	28	31.8	-	-	5	21.7	23	67.6	<.0001*
Sufficient/very sufficient	60	68.2	31	100.0	18	78.3	11	32.4	
Have you ever applied rapid sequence entubation in your carreer?									
Yes	48	46.6	30	96.8	9	23.7	9	26.5	<.0001*
No	55	53.4	1	3.2	29	76.3	25	73.5	
Your knowledge level of recognising bleeding and ischemia in Brain CT?									
Very insufficient/insufficient/I have no idea	48	46.2	1	3.2	23	59.0	24	70.6	<.0001*
Sufficient/very sufficient	56	53.8	30	96.8	16	41.0	10	29.4	

* p values are taken from chi-square test. **p values are taken from Fisher's Exact test.

melena are important factors which cause to increase significant anemia morbidity and mortality.

Conclusion

With this study, we found evidence indicating a serious lack of knowledge among practitioners treating patients in the ER and specialist not related to emergency medicine regarding crucial matters related to patients admitted to the ER. The physicians can consider themselves as sufficient or very sufficient. Giving the knowledge to the people who are not aware of their incompetency can be hard and impossible. The physicians should take whether the up-to-date information is applied or not into consideration while providing emergency maintenance service. Emergency medical education programmes are still new in Turkey. The other physicians are going to provide service to the emergency patients for a time until adequate number of emergency medical physicians come through. Emergency patient maintenance process should be arranged for using the available emergency medical physicians efficiently and educating the other doctors. The competence of the staff providing emergency departmentconcerns the health managers as well as the service receivers.

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Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Dr Lütfi Kırdar Kartal Training and Research Hospital.

Informed Consent: The physicians who wanted to took our survey are included in the study, so that informed consent was waived.

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