

Evaluation of non-urgent visits to a busy urban emergency department

Serkan E. Eroglu, MD, Siddika N. Toprak, MD, Oguz Urgan, MD, Ozge E. Onur, MD, Arzu Denizbasi, MD, Haldun Akoglu, MD, Cigdem Ozpolat, MD, Ebru Akoglu, MD.

ABSTRACT

الأهداف: تحديد نسبة المرضى الذين تم نقلهم إلى غرفة الطوارئ على أساس الإجراءات القانونية و الطبية غير الطارئة.

الطريقة: أجريت هذه الدراسة الاستطلاعية في قسم الطوارئ، مستشفى توروس الحكومي، مرسين، تركيا. وقد تم جمع البيانات خلال 4 أسابيع وتحليلها باستخدام اختبارات الإحصائية التالية: أنوفا، وكلمونوقراف سمونوفو، وكارسكل ويلسي.

النتائج: خلال فترة الدراسة زار 21,014 مريض قسم الطوارئ، مرسين، تركيا. تم قياس الطلبات خلال 3 فترات (08-16، 16-00، 00-08 ساعة). وكان العدد الإجمالي للحالات المستقبلية العادية في الطوارئ 16,370 مريض. وتم تقييم 4,644 (22.1%) من هذه الزيارات على أنها غير مناسبة. وفقا لدراستنا كان الاستخدام غير الملائم للقسم الطوارئ 51.1% و سجل الاستخدام الأكثر خلال فترة 08-16.

خاتمة: إن الهدف الرئيسي من الدراسة وصف استخدام قسم الطوارئ من قبل المرضى الذين أتوا من دون شكوى، الأمر الذي يجعل دراستنا مختلفة ومتميزة. وينبغي أن تأخذ الدراسات المستقبلية بعين الاعتبار نتائج دراستنا لتحديد النسبة المئوية لحالات الطوارئ الحقيقية.

Objectives: To identify the proportion of patients who were taken into the emergency room on the basis of legal regulations and non-urgent medical procedures.

Methods: This prospective study was conducted in the Emergency Department, Toros State Hospital, Mersin, Turkey. Data were collected over 4 weeks (January 2011) and then analyzed using the Kolmogorov-Smirnov, Analysis of Variance, and Kruskal-Wallis H tests.

Results: During the study period, 21,014 patients visited the Emergency Department. The applications were measured during a 3-shift schedule (08-16, 16-00, 00-08 hours). The total number of ordinary emergency admissions was 16,370. Of the total, 4,644

(22.1%) of the visits were evaluated as inappropriate. According to our study, inappropriate use of the emergency department was 51.1% more frequent during the 08-16 hours shift than the others.

Conclusion: Inappropriate use of EDs with non-urgent applications makes it difficult to guarantee access for real emergency cases, decreases the readiness for care, and produces negative spillover effects on the quality of emergency services.

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From the Department of Emergency Medicine (Eroglu, Urgan, Onur, Denizbasi, Ozpolat, Akoglu E), Marmara University Pendik Research and Training Hospital, Department of Emergency Medicine (Akoglu H), Kartal Lutfi Kırdar Research and Training Hospital, and the Department of Emergency Medicine (Toprak), Toros State Hospital, Mersin, Turkey.

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Address correspondence and reprint request to: Dr. Serkan E. Eroglu, Marmara University Pendik Research and Training Hospital, Istanbul, Turkey. Tel. +90 5323010866. Fax. +90 (0216) 6254791. E-mail: drseroglu@gmail.com

Emergency treatment aims to perform procedures to immediately relieve well-circumscribed situations, and is not intended to include on-going care. However, patients frequently seek the emergency department (ED) to obtain immediate attention in order to perform tests and administer medication to relieve symptoms. Meanwhile, such demand generates a kind of care that fails to create a bond with the health service (in which patients would receive not only treatment to relieve their immediate symptoms, but also health education) or to link with on-going care in order to prevent complications and new illnesses. Such use of ED services is thus considered inappropriate.¹ Inappropriate ED use makes it difficult to guarantee access for real emergency cases, decreases readiness for care, produces negative spillover effects on the quality of emergency services,

and raises overall costs. The healthcare system in Turkey has entered a long period of development under the 2003-2013 Health Transformation Program. The purpose of the program is to increase the quality and efficiency of the healthcare system and enhance access to healthcare facilities. Healthcare reforms, such as centralized health insurance/social security, leading to better and wider access to healthcare. Employers must register their employees with the health insurance fund known as the Social Insurance Organization for Health.² Income is then automatically deducted from each person's salary. Dependent family members are covered by the contributions paid by employed family members. The unemployed, old age pensioners and people on long-term sickness benefit or maternity leave do not have to pay healthcare contributions, as the government pay. The state fund covers most medical services including treatment by specialists, hospitalization, prescriptions, pregnancy and childbirth, and rehabilitation emergency care is available free for Turkish citizens including those without state health insurance. Emergency departments are open non-stop all year. You may use emergency services if you think that you are emergent directly without referral of primary care physician. You can go to ED for repetitive injection of drugs those were prescribed elsewhere other than ED. Waiting time to see doctors in elective outpatient clinics vary and it is better to try to obtain an advance appointment other than EDs in Turkey. Also EDs are used for reporting physical exam of the people who were brought by the police for forensic medical exams (forensic causes). After these arrangement, according to the 2010 statistical yearbook of the Ministry of Health of Turkey, 302 million people applied to private and public hospitals.³ In the same year, a total of approximately 50 million patients were admitted to hospitals in Istanbul, which is the most populous city in Turkey,⁴ and approximately 10 million of them (1/5 of total) were admitted directly to ED.⁵

Overcrowding and inappropriate use of EDs have been described in many studies. The percentage of patients going to an ED for non-urgent problems is between 9% and 54% in the USA, between 25.5% and 60% in Canada, and between 19.6% and 40.9% in Europe; higher percentages have been found in Kuwait (61%) and in Hong Kong (57%).⁶ Non-urgent ED patient visits may result from individual requests,

legal regulations or non-urgent medical procedures. According to the literature, individual factors include: the desire to receive care on the same day,⁷⁻⁹ the possibility of being attended to in a setting where it is possible to do laboratory and other tests,^{8,10} and the belief that ER services are able to solve complex types of health problems.^{8,11,12} In addition to this, there is no literature review that investigates effect of these health politics, the impact of legal regulations or non-urgent medical procedures on the overcrowding of EDs.

The objective of this study was to identify proportion of patients who were taken into the ED on the basis of legal regulations and non-urgent medical procedures, separately. This can provide important information for addressing the problem and improving the performance of health care in EDs. Knowledge of the prevalence and factors associated with inappropriate ED use can help orient public policies to reduce the problem.

Methods. We carried out a cross-sectional study of the ED utilization in Mersin, Turkey. According to the Address-Based Population Recording System of Turkey, the country's population was 74.7 million people in 2011, nearly three-quarters of who lived in towns and cities. Mersin is one of the big cities of Turkey and Mersin's hospitals cover the healthcare needs of the approximately 1,648,000 inhabitants of this province (15,737 km²).¹³ People within the 15-64 age group constitute 67.4% of the total population; the 0-14 age group corresponds to 25.3%; while senior citizens aged 65 years or older make up 7.3%.

The data collection was conducted prospectively from 4-31 January 2011 at the Emergency Department, Toros State Hospital, Mersin, Turkey. The Institutional Review Board approved the study. Verbal consent was obtained after explaining the consent statement. The study was conducted in accordance with the principles of the Declaration of Helsinki. Data were collected during 4 weeks to have an equal number of days. The data collection was performed by trained triage nurses using standard data collection forms to gather patient demographics, reasons of application to ED, and results of application.

The urgency of the presenting complaint was defined according to the Australian National Triage Scale (NTS), a previously developed standardized and validated set of criteria.¹⁴ Patients' applications were classified as appropriate or inappropriate. Application was appropriate when referred by health professional classified from 1-5 on the Australian scale, required ≥ 4 hours of treatment or observation, was hospitalized or died. Other situations were inappropriate. Inappropriate

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group consisted of the following: 1) People want to use ED for any reason other than injection have no new complaint about any disease (IA). 2) Forensic causes (people who were brought to the ED by the police for forensic medical exams), and 3) Injection of repetitive drugs to those were not prescribed in ED that day (application for the injection room [AIR]). These cases did not get a triage category and accepted as inappropriate. Thus, patients in triage categories 1-5 were excluded from the study to prevent unnecessary delays in their treatment, and accepted as appropriate because of having a new complaint those will examined in ED. Patients were excluded if they did not accept to be involved in the study or voluntary withdrawal before completion of the study, and if there were incomplete data set for the patient or if they had communication difficulties not related to their presenting complaint. We included all patients of all ages presenting to the ED including during the study period. Individuals who returned more than once answered the questionnaire only once. Each day, independent 2 emergency medicine specialists again revealed the previous days patients' folders, data collection forms, and triage notes to decide if patient's application to ED is non-urgent cases, inappropriate applications or need confirm final decision. Gathered information were reason for ED application, period of application, and ambulance use to arrive ED.

Statistical analysis. Physicians entered their patient's data into a database (Microsoft Excel 2007 software), which were pooled for analysis. Normal distribution was tested using the Kolmogorov-Smirnov test. Data

with normal distribution were analyzed using analysis of variance. The Kruskal-Wallis H test was used for analysis of non-parametric independent data groups. Statistical tests were considered significant at $p < 0.05$. Statistical tests were conducted using Statistical Program for the Social Sciences, Version 17.0 (SPSS, Chicago, IL, USA).

Results. During the study period, 21,014 patients visited the ED. Appropriate applications were 77.9% ($n=16,370$). Forensic causes that were brought to ED by the police for forensic medical exams were consisting of 1.6% ($n=335$) of the total number, of these, 2.6% ($n=544$) were IA and 18.7% ($n=3,936$) were AIR (Table 1). Reasons for inappropriate application were prescription refill, blood pressure measurement, request for an analysis by the patient (glucose analysis, pregnancy test, job applications tests, x-ray, and blood tests), inappropriate report request, vaccine application (booster), catheter exchange (foley, nazogastric, nazoduodenal), forensic causes and blood alcohol test (determination of ethyl alcohol for legal request), application for the injection room (AIR), old wound dressing, suture removal, request for the examination, and observation of other health institutions. The applications were evaluated according to time period. Time periods were classified in 3 categories: 1) 08:00-16:00 hours, 2) 16:00-00:00 hours, 3) 00:00-08:00 hours. When application ratios are evaluated it was seen that 8.7% ($n=1835$) of the applications presented between 00:00-08:00, 40.6% ($n=8523$) presented between 08:00-16:00, and 50.7%

Table 1 - Emergency department applications in Toros State Hospital, Mersin, Turkey.

Applications	Shift hours			n (%)	
	00:00-08:00	08:00- 16:00	16:00-00:00		
Incoming patient for blood pressure measurement	8	49	14	71	(0.3)
Other inappropriate application	7	147	29	183	(0.9)
Old wound dressing/suture removal	4	107	106	217	(1.0)
Inappropriate observation patients	1	60	12	73	(0.4)
Application for the injection room	110	1966	1860	3,936	(18.7)
Appropriate emergency admissions	1667	6151	8552	16,370	(77.9)
Upper respiratory systems diseases				6,448	(39.4)
Muscle/joint diseases				1,493	(9.1)
Lower respiratory tract diseases, COPD, asthma				1,435	(8.8)
Headache				817	(5.0)
Urinary tract diseases				684	(4.2)
Stomach and duodenal diseases (benign)				635	(3.9)
Gastroenteritis				505	(3.1)
Other diseases				4,353	(26.6)
Total	1835	8523	10656	21,014	(100.0)
Percentage	8.7	40.6	50.7	100,000	

ED - emergency department, COPD - chronic obstructive lung disease

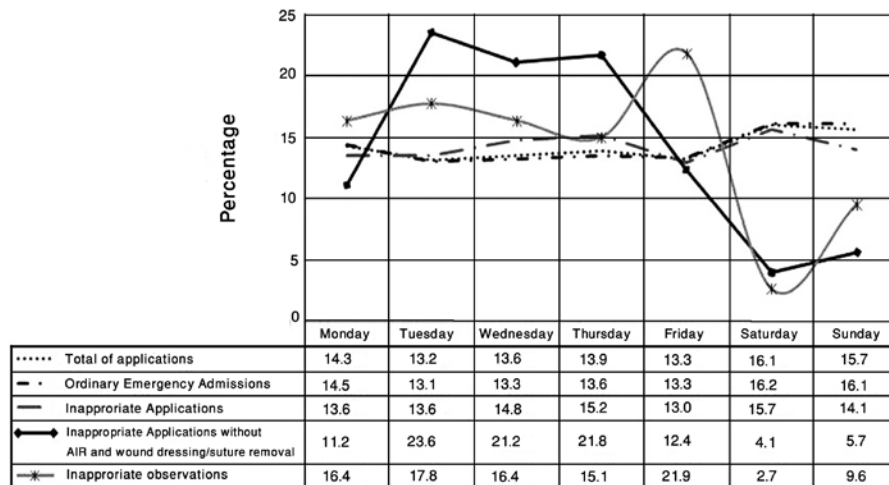


Figure 1 - Distributions of emergency department visits by days in Toros State Hospital, Mersin, Turkey.
AIR - application for the injection room

(n=10656) presented between 16:00- 00:00. During the study period, the distribution of total 21,014 visits to ED by days was as follows: Mondays (14.3%), Tuesdays (13.2%), Wednesdays (13.6%), Thursdays (13.9%), Fridays (13.3%), Saturdays (16.1%), and Sundays 15.7% (Figure 1).

The total number of appropriate emergency admissions included in the study was 16,370. The most common presenting conditions classified according to ICD10 were upper respiratory tract complaints (39.4%), muscle/joint (9.1%), and lower respiratory tract (8.8%). Of the total number, 4,644 (22.1%) of the visits were evaluated as inappropriate. It was seen that 3.6% (n=168) of them presented between 00:00-08:00, 51.1% (n=2372) presented between 08:00-16:00, and 45.3% (n=2104) presented between 16:00-00:00 hours. According to our study, inappropriate use of ED was more frequent between 08:00-16:00 shift compared with other shifts. There were significant differences among the 3-shift schedule ($p=0.001$; <0.05). However, the distribution of IA by days did not show any statistical significance ($p=0.736$; >0.05). We found IAs on Mondays 13.6% (n=632), Tuesdays 13.6% (n=632), Wednesdays 14.8% (n=686), Thursdays 15.2% (n=706), Fridays 13% (n=604), Saturdays 15.7% (n=730), and Sundays 14.1% (n=654) (Figure 1).

In Turkey, EDs have observation units to be used for patient under observation for maximum 24 hours period. Inappropriate indication for observations (patient who directed to observation room for old prescription which includes parenteral treatment, the request for evaluations by the other doctors, at the request examination and observation of other health

institutions) were evaluated during a 3-shift schedule (08:00-16:00, 16:00-00:00, 00:00-08:00 hours). It was observed that 1.4% (n=1) of the applications were presented between 00:00-08:00, 2.2% (n=60) between 08:00-16:00, and 16.4% (n=12), between 16:00-00:00 hours. There were significant statistical differences among the 3-shift schedule ($p=0.001$; <0.05). The most common inappropriate observations were found in the 08:00-16:00 shift (82.9%); and 91.7% (n=55) of them were seen on working days. There were significant statistical differences among the working days and weekends ($p=0.002$; <0.05) with the highest number on Fridays during the 08:00 to 16:00 shifts. During the study period, 676 patients were transported to our ED by an ambulance services. Of these, 15.2% (n=103) of them presented between 00:00-08:00 hours, 38.2% (n=258) presented between 08:00-16:00, and 46.6% (n=315) presented between 16:00-00:00 shifts. There were significant differences among the 3-shift schedule ($p=0.001$; <0.05). However, the distribution of these patients by days showed no significant differences ($p=0.315$; >0.05). Among the 676 patients, 86 patients, who were transported by ambulance were categorized as forensic causes. Of these patients, 54.7% (n=47) presented between 00:00-08:00, 9.3% (n=8) presented between 08:00-16:00, and 36% (n=31) presented between 16:00-00:00 hours. The distribution of these patients by days showed no statistical significant differences ($p=0.712$; $p>0.05$). Although there were significant differences among the 3-shift schedule ($p=0.001$; $p<0.05$).

Discussion. The results of our study indicate a significant prevalence of inappropriate use of emergency room in Mersin, Turkey. Toros Hospital has only one emergency service that attends all public demand, so there was a low percentage of missing data and refusals, and it is likely that our sample was representative of emergency room utilization within the city. There are several criteria for determining the appropriateness of ED utilization, including observation time needed, health professionals' perceptions, and resources required for medical evaluation. In previous studies, many types of triage scoring systems were used¹ and inappropriate applications were mostly non-urgent. Almost all forensic causes were not included in the study; however, we want to show that people who are not sick, who had no new complaint also abuse ED, and these groups must not be under rated. Approximately 22% of applications to ED in Turkey are absolutely unnecessary. This rate may be seen low when compared with other studies,^{8,15} but it must be remembered that there is no triage category 4-5 patients in our group; thus, we observed inappropriate applications in our study as underestimated.

After the declaration of "all emergency services should be available for anyone, in any condition, in any hospital for free" from The Ministry of Health in Turkey, EDs are abused for several reasons. First, anyone with a request for access to the ED is evaluated. This study results were mostly AIR and dressing/suture removal. Also, when anyone evaluates the other inappropriate reasons in this study such as dressing for old wounds or blood pressure measurement, it was observed that the health policy in a country for popularism provides a wrong impression especially to EDs. Due to the common opinion that the Turkish health care system provide admission to the emergency services for demands related to any disease; therefore, hospital management must provide the additional tasks to the emergency services (injection room). Previous study,¹ reported that inappropriate use of ED was higher during the morning shift although all health care units are working online. In addition to this, the numbers of ED patients on Saturdays and Sundays were higher compared with other days, and this was shown to be statistically significant ($p=0.001$; $p<0.05$). There are several reasons: 1) difficulty of getting appointment from outpatient clinics, 2) difficulty in accessing primary health care (short business hours at the primary health care service, distrust to general practitioners), and poor expectations about primary health care access.¹⁶ Thus, primary care needs fully qualified patient reception and efficient triage to promptly attend cases that cannot wait. In Turkey, primary care centers

cannot study laboratory tests immediately; so this is directing people to EDs. In EDs, it is easy and quick to reach each test (laboratories, radiology) in one place. In addition to this, sometimes people are brought to ED by the police or by military forces for 2 reasons: 1) blood alcohol test or forensic examination before and after police custody. This physical examination is performed to confirm that the patients have not been injured by any involuntary or unexplainable processes that may lead to any suspicious legal accounts later. All the patients brought by the military or police are commonly brought without any complaint. 2) The alcohol blood test, which is demanded by the police for criminal situations, is carried out to compare the blood alcohol level with the value of the legal limit of the blood alcohol level. Therefore, overcrowding is frequently observed in Turkish EDs. Overcrowding in EDs is a major public health problem. According to the literature, the percentage of ED applications with non-urgent complaints reaches up to 61%.¹⁷⁻²³

The inappropriate use of EDs makes it difficult to guarantee access for real emergency cases, decreases the readiness for care, produces negative spillover effects on the quality of emergency services, and raises overall costs.^{8,22,24,25} According to our study, the most common inappropriate indications for directing to the observation room of ED were found in the 08.00-16.00 shift (82.9%). Approximately 91.7% of them were seen during working days. This situation suggests the relation of outpatient clinics' referral to ED for hours of observation. Friday was the busiest working day due to no clinics during weekends.

Study limitations. This was a prospective study, as there was no possibility to carry out a blind study. In this study, patients not eligible for triage were included in the study. This may be a pitfall and underestimate inappropriate users. All triage nurses were educated on the Australian National Triage Scale before the study period and gave a triage category to people. Emergency physician's second looked all data. Some demographic features cannot be completed due to ED crowding.

In conclusion, the rise of consumerism in healthcare and increasing patient satisfaction increase votes of politicians and these have become an important issue for health politics. Free emergency services and non-established primary health care services induce abuse of ED. This study revealed the applications, which should not be accepted by EDs. Future studies should be carried out to find a way of increase people satisfaction without abusing EDs in countries such as Turkey. Also, education efforts are also crucial and should focus on how to use health services appropriately, as well as

explain to the public about the type of care provided in ED and the risks and disadvantages of using these services as the primary source of care.

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