

# Frequent attenders to emergency department in a research hospital in Turkey

## Türkiye’de bir araştırma hastanesinde acil servise sık başvuru nedenleri

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### ABSTRACT

**Aim:** Frequent attenders to emergency departments have become an increasingly important healthcare problem in the whole world. In our study we aimed to define characteristics of this frail population with their own unique problems.

**Method:** Study was conducted in Ankara Numune Training and Research Hospital during a 1-year period between 01.01.2013 and 01.12.2013 with adult patients older than 18 years old who made emergency visits more than 12 times a year were included in the study. Each patient’s demographic data (age, sex, marital status), medical insurance status, cause of death, residential address, chronic disorders were noted and included in evaluations.

**Results:** A total of 169,066 emergency department visits done by 124,574 different patients were detected. Hundred and seventeen frequent attenders (76 men, and 41 women) visited emergency departments for a total of 2,162 times. The number of visits ranged from 12 to 91 per year. Of them the uninsured patients were significantly older. Both the age and number (%) of divorced/widowed patients were significantly higher compared to other groups ( $p<0.05$ ). Pain was significantly the most common presenting symptom followed by psychiatric complaints. Frequent attenders had mostly psychiatric and chronic painful diseases in general but patients with hematological disorders had visited emergency services significantly more frequently compared with the patients with other chronic diseases. Sixteen patients died during the study period. It was demonstrated that the deceased patients had applied to emergency services more frequently, and they had significantly higher mean age, and significantly higher rates of chronic internal and oncological disorders.

**Conclusion:** The patients who visited emergency services frequently belonged to a frail population with complex problems. The solution of these problems should priorly be possible with recognition of characteristic features of this patient population.

**Keywords:** Emergency medicine, frequent attenders, overcrowding

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### ÖZ

**Amaç:** Acil servislere yineleyen başvurusu olan hastalar, dünya çapında önemli bir sağlık sorunu haline gelmiştir. Çalışmamızın amacı, kendine özgü problemleriyle kırılğan olan bu hasta popülasyonunun özelliklerini tanımlamaktır.

**Yöntem:** Çalışmaya 01.01.2013-01.12.2013 tarihleri arasında 1 yıl süre ile Ankara’da bir eğitim ve araştırma hastanesi acil servisine başvurmuş 18 yaş üstü hastalar dahil edildi. Her hastanın demografik verileri (yaş, cinsiyet, medeni durum), sağlık sigortası, ölüm nedeni, yerleşim adresi, kronik rahatsızlıkları kaydedildi ve değerlendirilmeye alındı.

**Bulgular:** 124.566 farklı hasta tarafından yapılan toplam 169.066 acil servis ziyareti yapıldığı belirlendi. Yüz on yedi mükerrer hastanın toplam 2.162 kez acil servise başvurduğu görüldü. Bu hastaların 76’sı erkek, 41’i kadındı. Başvuru sayıları yılda 12 ile 91 arasında değişmekteydi. Sigortasız hastalar daha yaşlıydı. Boşanmış/dul olanların yaşı ve mükerrer başvuru sıklığı diğer gruplara göre anlamlı olarak yüksek bulundu ( $p<0,05$ ). Ağrı, psikiyatrik şikayetleri takiben en sık görülen semptom olarak belirlendi. Bu hasta grubunda psikiyatrik ve ağrılı kronik hastalıklar sıklıkla görüldü ve hematolojik hastalığı olanların diğer kronik hastalığı olanlara göre daha sık acil servis başvurusunda bulunduğu belirlendi. Çalışma süresince 16 hasta öldü. Ölen hastaların acil servise daha sık başvurduğu, yaş ortalamasının yüksek olduğu kronik dahili ve onkolojik hastalıklarının daha sık olduğu gösterildi.

**Sonuç:** Kırılğan bir popülasyon olan ve acil servise yineleyen başvurularda bulunan hastaların karmaşık sorunları vardır. Bu sorunların çözümü öncelikle bu hasta popülasyonunun karakteristik özelliklerini tanımak ile olası olabilecektir.

**Anahtar kelimeler:** Acil tıp, sık hastalar, aşırı kalabalık

## INTRODUCTION

Overcrowding of emergency departments is a major public health problem worldwide<sup>1</sup> referring to a condition whereby the number of emergency visits exceeds the capacity of emergency room and the healthcare staff's limit of delivering an adequate and efficient health care. When this condition persists on a long-term basis, emergency departments are overloaded by a regularly excessive patient volume and continuously work beyond their capacity.

Ninety million emergency department visits occur each year in Turkey, a country with a unique place in the world for providing healthcare to many patients that is greater than its whole population, where overcrowding of emergency department is experienced in its most severe form. Frequent attenders who have lower disease severity scores usually visit emergency departments for non-emergent causes, leave emergency departments on their own free will, and have a lower hospital admission rates compared to one-time attenders. In addition, they visit family physicians more often, and more commonly use community health nursing services, social services, addiction counseling and psychiatric support services, and other departments<sup>2,3</sup>.

In this study, we aimed to define the group of frequent attenders and their characteristics. Thus, the features of emergency department visits of this group of frail patients can be more clearly understood and the information provided by this study can be used to find solutions to reduce the rate of recurrent visits.

## MATERIAL and METHOD

The study center was a reference hospital in Turkey. This study was conducted retrospectively by reviewing case series that frequently visit emergency departments. After approval of the study by the ethics committee, this study retrospectively reviewed all emergency department visits during a 1-year period between 01.01.2013 and 01.12.2013. There is controversy about the definition of frequent attenders in

the literature. While some studies have considered having at least two visits within a 1-year period is sufficient for the definition of frequent attenders, the number goes up to at least 12 visits in some others<sup>3-6</sup>. On the other hand, some studies included frequent visits not only within a year, but also within different time frames<sup>7,8</sup>. We defined frequent visits as 12 visits within a period of 1 year and included adult patients aged 18 years or older who visited emergency departments for 12 times or more.

## Measurement of Variables

The primary reason for emergency department visit was considered as admission diagnosis, and additional information regarding chronic disorders were obtained from our hospital's database including each patient's demographic data (age, sex, marital status), medical insurance status (green card is an insurance type which is given to poor and unemployed citizens by government), cause of death, and residential address, with the latter being used to calculate the distance between residential address and the study hospital from Google Maps. All diagnoses were classified according to the ICD classification. Patients were declared dead when they died during the study period while they were considered as alive when they died afterwards.

## Statistical Analyses

Continuous variables were analyzed by analyzing mean, median, and standard deviation while categorical variables using analysis of frequencies. Statistical significance was determined using chi-square, Kruskal-Wallis, and Mann-Whitney U tests as appropriate. A  $p < 0.05$  was considered statistically significant. All statistical analyses were performed using SPSS v. 15.

## RESULTS

A total of 169,066 emergency department visits were made in the calendar year of 2013 and a total of 124,574 patients visited emergency department during the same period, with the difference between the two figures representing the repeated visits.

During the same period, patients visited our emergency department for 1 to 4 (n=121,828 :97.8%), ≥ 4 (n=2625:2.1%; total n=16,784:9.9%), and ≥ 12 (n=119:0.1%, total n=2,192: 1.3%) times.

Of 119 patients , 2 were excluded from the study due to missing medical data, and the remaining 117 patients were included in the study. The age range of these 117 patients was 18-81 years, with a mean age of 41.5±15.3 years and a median age of 41 years. There were 76 (65%) men and 41 (35%) women in the study.

Thirty-four (29.1%) patients were single, 22 (18.8%) were divorced/widowed, and 45 (38.5%) were married. Six more patients were excluded from the final analysis owing to missing medical data. Twenty-six (26/76:34.2%) men, and nineteen (19/41:46.3%) women were married Both the age and frequency of divorced/widowed participants were significantly higher compared to other groups (p<0.05).

Hundred and seventeen patients visited emergency departments for a total of 2,162 times. The interval

**Table 1. Distribution of frequent patients by medical insurance status.**

	Mean repeated visits	Mean frequency	Mean age	Percentage of Men/Women	Percent
Green Card	20.64±20.5	17±9.13	42.1±17.2	%94.1	%14.5
Insured	17±5.6	15.16±7.5	42.3±16.12	%46	%57.3
Uninsured	17.5±7.8	14.4±8.5	35.5±10.8	%95.2	%17.9
In need of nursing	23.5±16.24	15±7.4	46.4±13.3	%75	%10.3

\*One female patient with insurance was excluded owing to being a convict.

**Table 2. The most common 15 diagnoses of frequent patients in the emergency department.**

Admission diagnosis in the emergency department	Number of visits	Number of patients	Percent among total repeated visits
Pain-related*	631	76	28.7
Psychiatric complaints	131	13	5.9
UTI	130	34	5.9
Abdominal/Pelvic pain	102	24	4.6
Headache	76	14	3.4
Anxiety	72	20	3.2
Fatigue/Malaise	62	12	2.8
COPD/Dyspnea	60	10	2.7
General examination	59	15	2.6
Urticaria	50	13	2.2
Alcohol-related	46	6	2.0
Drug withdrawal symptoms	42	4	1.9
Simple trauma	42	25	1.9
Renal colic	40	5	1.8
Vertigo	38	8	1.7

\*Includes myalgias, low back pain, chronic disease pain, and chronic peripheral artery disease.

**Supplementary table detailing pain-related diagnoses**

Admission diagnosis in the emergency department	Number of visits	Number of patients	Percent among total repeated visits
Chronic pain	280	38	12.7
Back pain	167	17	7.6
Extremity myalgias	167	14	7.6
Abdominal/Pelvic pain	102	24	4.6
Headache	76	14	3.4
Renal colic	40	5	1.8
Chronic peripheral artery disease pain	17	2	0.7
Total	849	82	38.7

between visits ranged between 1 day and 30 days. The mean frequency of visits was 14.6±7.9 days, and the number of visits ranged between 12 and 91 (mean 18.28±10.8). The medical insurance status of the patients is summarized in Table 1. Notably, the uninsured patients were significantly older than other groups (p<0.05).

Emergency department visits were also analyzed with respect to time of visit, i.e. between 8.00-17.00 and 17.00-8.00. According to this analysis, among the total number of 2,139 visits, 750 (33.7%) occurred during night shifts (17.00-8.00) and 1,412 (65.3%) occurred during day shifts (8.00-17.00). Thirty-seven patients with a chronic psychiatric disorder, who constituted

**Table 3. Distribution of the diagnoses for which patients visited emergency department at least once.**

	Frequency/Percentage	M/F percentage	Mean age	Mean number of repeated visits	Mean Frequency
Infectious diseases	48 (41.0%)	%56.2	39.2±14.2	18.7±12.8	16.3±8.3
Psychiatry	42 (35.6%)	%78.5	40.2±13.6	19.8±9.61	15.06±7.82
Gastroenterology	38 (32.5%)	%50	44.5±16.75	17.5±7.46	15.2±7.62
Physical therapy and rehabilitation / rheumatology	30 (25.6%)	%73.5	38.2±13.06	21.3±16.2	15.4±8.06
Neurology	30 (25.6%)	%60	41.1±18.06	16.6±4.45	16.2±8.29
Dermatology	17 (14.5%)	%76.4	41.2±15.17	19.4±10.28	11.2±6.58
Chest Diseases	14 (12.0%)	%71.4	44.1±18.52	16.4±4.51	15.4±9.06
General Surgery	13 (11.1%)	%61.5	37.2±15.18	15.7±4.93	15.6±8.11
Hematology-Oncology	9 (7.7%)	%55.5	53.1±11.7	15.7±5.23	13.1±7.04
Gynecology and Obstetrics	9 (7.7%)	%62.5	24.4±6.02	14±2.78	22.2±4.27
Urology	9 (7.7%)	%62.5	40.3±12.53	15.2±3.92	17.5±7.64
Cardiology	7 (6.0%)	%71.4	44.2±15.6	15.2±3.59	15.7±9.23
Nephrology	5 (4.3%)	%60	49.4±15.53	14±3.39	9.7±11.1
Ophthalmology	5 (4.3%)	%80	37.9±12.66	17.2±3.71	16.6±5.80
Endocrinology	4 (3.4%)	%75	42.7±2.87	15.7±12.66	15.3±11.09
Orthopedics	2 (1.7%)	%100	45±7.07	32.5±28.917	9.5±8.20
Cardiovascular Surgery	1 (0.9%)	%100	52	24	7

**Table 4. Distribution of additional outpatient clinic visits.**

Visited outpatient clinics	Number/Percentage of patients visiting other outpatient clinics	Number/Percentage of outpatient clinic visits
Psychiatry	35 (29.9%)	167 (24.3%)
Physical therapy and rehabilitation / Rheumatology	19 (16.2%)	32 (4.6%)
Neurology	18 (15.4%)	44 (6.4%)
Cardiology	15 (12.5%)	21 (3.0%)
Gastroenterology	14 (12%)	16 (2.3%)
Cardiovascular Surgery	12 (10.3%)	15 (2.1%)
Otorhinolaryngology	11 (9.4%)	24 (3.5%)
Dermatology	11 (9.4%)	23 (3.3%)
Orthopedics	11 (9.4%)	17 (2.4%)
Hematology / Oncology	10 (8.5%)	90 (13.1%)
General Surgery	10 (8.5%)	26 (3.7%)
Ophthalmology	10 (8.5%)	23 (3.3%)
Urology	9 (8.5%)	34 (4.9%)
Nephrology	8 (6.8%)	19 (2.7%)
Chest Diseases	7 (6%)	20 (2.9%)
Endocrinology	6 (4.1%)	7 (1.0%)
Infectious diseases	5 (4.3%)	7 (1.0%)
Internal Medicine	4 (3.4%)	24 (3.5%)
Gynecology and Obstetrics	4 (3.4%)	22 (3.2%)
Algology	4 (3.4%)	11 (1.6%)
Brain Surgery	4 (3.4%)	9 (1.3%)
Plastic Surgery	1 (0.9%)	2 (0.2%)

a special subgroup of our study visited emergency department for 497 times during day and 262 times during night shifts.

The final diagnoses of the patients were determined and the most common diagnoses were grouped to determine the medical branches related to these diagnoses. According to this analysis, the distribution of the medical branches related to the most common diagnoses is shown in Tables 2 and 3.

The statistical analysis revealed that patients with chronic rheumatic pain and men suffering from pain visited emergency departments significantly more frequently ( $p<0.05$ ). Among patients visiting emergency departments for psychiatric reasons at least once in a year, after a suicide episode or for a chronic psychiatric disorder had a significantly higher rate of alcohol use ( $p<0.05$ ). In addition, elderly patients more commonly used alcohol ( $p<0.05$ ). Those with psychiatric disorders visited emergency departments more frequently than those without ( $p<0.05$ ).

**Table 5. The list of chronic disorders of frequent patients.**

Branch of Chronic Disorder	Number/Percentage		M/F	Mean number of repeated visits	Mean frequency	Mean age
Psychiatry	37 (31.6%)	Schizophrenia n:25 Anxiety disorder n:7 Mood disorder n:5	%70.2	20.4±13.95	15.3±7.83	41.3±14.04
Physical therapy and rehabilitation / Rheumatology	15 (12.8%)	Osteoarthritis/Disc Hernia n:12 Rheumatic disorders: n:3	%60	22.7±19.87	11.10±6.12	40.9±7.06
Cardiology	14 (12%)	Hypertension:8 Chronic Heart Failure:4 Coronary Artery Disease:6	%64.2	16.9±5.18	13.7±7.56	57.5±18.11
Neurology	13 (11.1%)	Chronic cerebrovascular disease n:6 Epilepsy n:3 Dementia-Alzheimer's n:4	%61.5	17.2±4.41	15.4±6.33	52.3±22.54
Hematology / Oncology	13 (11.1%)	Hematologic malignancies:5 Oncologic malignancies:8	%61.5	19±11.23	11.2±5.91	54.5±16.01
Endocrinology	11 (9.4%)	DM n:8 Thyroid disorders n:5	%54.5	17.7±5.21	14.4±7.75	47.0±16.97
Nephrology	10 (8.5%)	CRF:10	%80	15.2±5.00	16.5±9.47	53.9±16.18
CVS	6 (5.1%)	Venous Insufficiency n:6	%33.3	16±5.47	9.9±8.00	45.6±18.61
Dermatology	5 (4.3%)	Chronic urticaria n:5	%83.3	12.6±0.54	15.4±10.13	40.6±12.73
Urology	5 (4.3%)	Urolithiasis n:4 Malignancy n:1	%100	15±5.19	17.9±7.17	41.2±8.87
Ophthalmology	3 (2.6%)	Conjunctival diseases n:3	%100	19.6±6.65	14.9±6.29	50.6±10.01
Gastroenterology	3 (2.6%)	Chronic Hepatitis n:3	%33.3	14±1	19.7±3.34	45.3±2.08
Chest diseases	3 (2.6%)	COPD n:3	%100	15.3±3.05	16.2±6.91	55±17.57
Infectious diseases	2 (1.7%)	Cellulitis n:2	%100	14±0	17.8±12.94	55±14.14
General Surgery	1 (0.9%)	Chronic hernia n:1	%100	12	18.2	22

The patients visited 8 different outpatient clinics other than emergency departments at least once. Patients visited 8 (n=3), 7 (n=2), and 6 (n=1) different outpatient clinics, whereas 32 patients did not visit any other outpatient clinics. Detailed information about the use of outpatient clinics is given in Table 4.

The list of chronic disorders is shown in Table 5. Patients with chronic internal or hematological disorders had visited emergency departments significantly more frequently compared to other patients ( $p<0.05$ ). Patients with chronic nephrological or rheumatic disorders had a higher frequency of emergency department visits compared to patients with other chronic disorders ( $p<0.05$ ), although no significant increase in the number of repeated visits was detected. Only 3 female, and 1 male (%3.4) patients with a mean age of 27.5 years visited emergency departments after at least one suicide attempt during the study period.

Sixteen (9.9%) patients died during the study period. These patients had a mean age of  $57.9\pm 15.3$  years with a median number of emergency department visits of 16.8, and a median interval of 15.7 days between emergency department visits. These patients, had hematologic-oncological disease (n=6: 37.5%), chronic psychiatric disease (n=4:25%), chronic cardiac disease (n=3:18.7%), and 2 (had nephrological disease (n=2:12.5%). Six out of 9 patients who died at our hospital died of oncological, and 3 of cardiac causes. The analysis of the deceased patients revealed that they had a significantly higher frequency of emergency department visits, significantly higher mean age, and significantly higher rates of chronic internal and oncological disorders ( $p<0.05$ ).

## DISCUSSION

Frequent attenders in emergency departments are a major public health problem; although they visit emergency department frequently, they seem not to find any solution for their medical problems. In studies the patients considered to be frequent attenders made  $\geq 12$  emergency department visits, that amount to 0.1% to 0.8% of the general emergency popu-

lation and they were responsible for 0.8% to 5.4% of total visits to emergency departments<sup>9-12</sup>. The factors related to emergency health care policies and medical insurance systems of some countries and regions may be the underlying cause of such a high proportion of frequent attenders in emergency departments. We suggest that the large number of patients who visited emergency departments for 1-3 times finally made  $\geq 12$  visits to the emergency departments that constituted 0.1% of the whole patient population, and being responsible for 1.3% of all emergency department visits. The findings of our study were in concordance with the literature in that men had a higher proportion among frequent attenders and the median age was around 40 years<sup>2,12-20</sup>. We did not detect any significant correlation between the number and frequency of emergency department visits and age or sex.

A limited number of studies specifically examining marital status of frequent attenders have shown that most of the patients were single<sup>9</sup>. In our study, the ratio of married patients was too low when compared to the ratio of married individuals in the general Turkish population, i.e. 63.9% according to Turkish Statistical Institute<sup>21</sup>.

According to a few studies examining the distance of a patient's residential addresses to emergency department<sup>9</sup>, most patients lived within 5 kilometers from emergency departments. Our study revealed that as distance from the hospital decreased the frequency of emergency visits and the number of frequent visits albeit non-significantly increased. The location of our hospital and the city plan of the city of Ankara indicates that our emergency department is 5-10 km away from centers of greater districts. This information may explain the discordance with literature data. It should be still emphasized that in accordance with literature data patients living closer to the hospital visited our emergency department more frequently.

On the other hand, another study analyzing the timing of emergency department visits in detail<sup>19</sup>, showed that emergency department visits became

more frequent after normal office hours. In line with literature data, though not statistically significant our results found a positive correlation between visiting emergency department after normal office hours and being of older age and male. Despite the absence of any specific data in our study regarding this occurrence, we suggest that this discordance results from outpatient physicians referring patients to emergency departments before noon, after examining them in their office. Also, being in close vicinity to other district hospitals, and far from workplace areas where a large population lives during daytime, may be reason why our hospital is visited more frequently during morning hours. We suggest that this subject should be further studied.

In some studies, a significant proportion of frequent attenders present with exacerbations of pre-existing disorders or complaints related to chronic disorders<sup>9,10,16,18,19,22</sup>. Studies have reported that the most common diagnoses at admission were injuries, sprains, UTIs, and abdominal pain, and that preexisting chronic psychiatric and internal disorders were the backgrounds of these diagnoses<sup>15,23</sup>. Although some former studies have stressed that frequent attenders commonly visit emergency departments after trauma, our study found a lower rate of trauma victims among frequent attenders. Like various studies in the literature, our study found that pain was the predominant admission complaint. Additionally, patients with hematological and oncological diseases constituted an important part of frequent attenders. Lack of training of frequent attenders about pain management provided by their primary and emergency physicians may give rise to frequent visits to emergency departments for pain. We believe certain strategies can be developed aiming at reducing emergency department visits for nonspecific complaints that can usually be managed by family physicians. Medico-social facilities can be built aiming at educating psychiatric patients and their families and provide them appropriate care to prevent emergency department visits.

Literature data indicate that elderly frequent atten-

ders with chronic internal problems or young frequent attenders with psychiatric disorders have a higher mortality rate<sup>24</sup>. In our study the mortality rate of elderly patients with chronic oncological disease was high; however, no significant difference was found in the psychiatric patient group.

An analysis of patients presenting to emergency department with psychiatric problems indicated that the demographic and clinical properties of our population were in concordance with the literature<sup>25</sup>. In some studies, it was shown that at least one emergency department visit of frequent attenders was related to mental health, alcohol, or drug use; and frequent attenders had a significantly higher rate of mental or addiction-related problems than patients who visited emergency services less frequently<sup>26</sup>. Liu et al.<sup>12</sup> reported that as the number of emergency department visits increased, the number of visits of psychiatric origin increased in parallel. According to our results, 35.6% of the patients presenting to emergency departments made at least one visit with a male predominancy. Besides, the number of visits increased among psychiatric cases than in non-psychiatric ones. It has been reported that drug addiction-related complaints have a significant proportion among causes of emergency department visits<sup>11,16,24,27</sup>. Alcohol- and drug-related repeated visits had a low proportion to total emergency visits in our study believed to be due to cultural background of our country.

#### Limitations of the study

The main limitation of our study was related to our inability to obtain information about frequent attenders' visits to other emergency departments, hospital outpatient clinics, and family physician offices. This may have resulted in errors related to frequent visits to emergency departments, exclusion of patients who visited our hospital less frequently relative to other hospitals, and a failure to include frequent attenders who were under follow-up for internal and surgical disorders at other centers, but visited our hospital to receive emergency department service care.

## CONCLUSION

Frequent attenders constitute a frail population with complex problems, the solution of which should primarily lie in familiarizing with this patient population and defining their characteristics. Further studies will be beneficial for solving the problems of these patients. Emergency departments, public health centers, family physicians, ancillary healthcare staff, and social service officials should work in collaboration for the solution of this problem.

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