

## Assessment of Patients Transferred from the Emergency Department to Home by Ambulance

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**Aim:** Our research aimed to examine patients' sociodemographic characteristics transferred from the emergency department to home by ambulance and the factors that cause ambulance transport. To our knowledge, there is no study presenting a perspective on patients who were discharged from the emergency department but were transferred home by ambulance. Although the literature on patients using pre-hospital ambulance services is full, it lacks patients in need of post-hospital ambulance services. Since it is the first study on this subject, it is aimed to be a guide for future studies.

**Materials and Methods:** This retrospective study was conducted at an academic tertiary care emergency department in Turkey between March 2019 and March 2020.

**Results:** Of the 1059 patients included in the study, 56.1% were women, 43.9% were male and their average age was 74.21 years. The most influential factors in transporting patients from the emergency department to home by ambulance were bedridden (%47,4), social reasons(%37,7) and oxygen need (%14,9).

**Conclusion:** The high average age of patients transferred from the emergency department to the home and the reasons for their transportation demands show that the increasing elderly population creates new requirements in health. Providing ambulance service to special groups for home transport after emergency room discharge should be seen as a part of emergency treatment. Standardization should be developed by carrying out studies on this subject.

**Keywords:** Ambulance, Transfer, Emergency Department

**Short Title in English:** Patients Transferred Home by Ambulance

### Introduction

Emergency services are easily accessible units that provide uninterrupted health care. In addition to medical necessity, special conditions related to the patient and his/her social situation may also play a role in emergency service admissions. In the developing health system, leaving the hospital should be scrutinized as well as the patients' arrival process. Every patient admitted to the emergency department should be carefully evaluated (1). Pre-hospital emergency health services have been established to provide both rapid treatment and critically ill patients' transport to emergency departments (2). Inter-hospital transfer rules regulated and supervised by various circulars issued by the Turkish Republic Ministry of Health maintain their importance (3,4). Also, the American College of Emergency Physicians states that institutions should obey certain rules regarding "appropriate interhospital patient transfer" (5). Demand for emergency ambulance services has been increasing in recent years. The rate of demand for ambulance services for hospital admission has grown over the years. Remarkably, the need for ambulance services for transfer from the hospital to home has also recently increased. Although there are studies on transfer from the field to the hospital, there are no regulations or research regarding transferring from the hospital to home.

Our study aimed to ~~investigate~~ reveal the sociodemographic characteristics of the patients who transferred home from the emergency department by ambulance and the factors that impact the ambulance request. This first study was also intended to provide a basis for further studies.

## **Materials and Methods**

This retrospective, cross-sectional study was conducted at an academic tertiary care hospital emergency department in Turkey between March 2019 and March 2020. The study protocol was approved by the XXXX Ethics Committee (Decision number: 2020/41. Date: 02/03/2020).

Patient information was obtained from the hospital data processing system, emergency department triage ~~patient~~ records, and forms that were prepared and required to be filled in by the hospital administration to transfer by ambulance. By examining the patients' symptoms and the International Classification of Diseases (ICD) codes at the time of admission that was accessed from the medical records, mean age, gender distribution, the way of arrival to the hospital, disease-based patient distribution, the reason for requesting an ambulance on discharge from the emergency department, transport, transfer time, and the distance (kilometers) the hospital and home were evaluated. When the reasons for the transfer from the emergency department to home by ambulance were analyzed, it was noted that they were categorized into three groups of patients: Immobile or bedridden patients who need someone's care; Patients who need oxygen support before applying to the emergency department; Patients who had transportation problems due to social reasons such as financial impossibility, not having a private car, and not having a public bus at the time of discharge were examined in three groups.

All patients were included in the study because the file records were not missing. Patients transferred from other clinics by ambulance were not included in the study.

## **Statistical Analysis**

The data were analyzed with IBM SPSS V23. Analysis results were presented as mean and standard deviation for quantitative data. The results were evaluated and interpreted at the 95% confidence interval and at the significance level of  $p < 0.05$ .

## **Results**

A total of 2554 patients was transferred to home by ambulance from a tertiary care university hospital in Turkey in one year period. One thousand and fifty-nine patients (41.5%) were transferred home from the emergency department, and 1495 (58.5%) from other clinics. Patients transferred from another clinic other than the emergency service were excluded. Of the 1059 patients included in the study, 56.1% (n=594) were female and 43.9% (n=465) were male; their mean age was  $74.21 \pm 13.08$  years (**Table 1**). Eighty-nine percent (n=948) of the patients were transported to the hospital by ambulance, and 11% (n=111) presented without an ambulance. An analysis of the reasons for admission to the emergency department of the patients showed that 26.3% (n=278) of the patients had dyspnea; 14% (n=148) had abdominal pain; 7.2% (n=72) had poor overall status; and 7.1% (n=71) had seizure (**Table 2**). The underlying diseases of the patients who were transferred home were as follows; cerebrovascular accident (CVA) in 37.4% (n=396), malignancy in 14.2% (n=152), Chronic Obstructive Pulmonary Disease (COPD) in 11% (n=116), and Alzheimer's disease in 5.4% (n=57) (**Table 3**). The reason for home transport from the emergency department by ambulance was being bedridden in 47.4% (n=502) patients, social reasons in 37.7% (n=399), and the need for oxygen support in 14.9% (n=158) (**Table 4**). Of the patients who were admitted to the emergency department, 96.8% (n=1025) were transported in company with an attendant while 3.2% (n=34) of the patients were transported alone. Forty-two percent (n=4449) of the patients were transferred between 08:00 and 16:00; 39.9% (n=423) between 16:00 and 00:00; and 17.7% (n=187) between 00:00 and 08:00. The mean transport distance was  $15.9 \pm 10.1$  kilometers (km) (min 5.3 km-max 49.9 km), and the mean transfer time was  $51.6 \pm 29.7$  minutes (min) (min 10 min-max 150 min).

## Discussion

The providing ambulance services in developed or developing countries and the ambulance usage rates of communities vary depending on local, socioeconomic, and cultural conditions. Emergency ambulance services worldwide are provided uninterruptedly for 24 hours under command-and-control centers at the provincial or regional scale (6).

As a result of an expansion in the elderly population, there has been an increase in the admissions of elderly patients to the emergency department (7). A study examining the age-based distribution of patients transported from the field by ambulance found that 13% -47.9%

of patients were over 60 years of age (8). In another study examining geriatric patients admitted to the emergency department, patients who were taken under observation for follow-up and treatment purposes had a mean age of 77.8 years (9). In the literature, the male patients have a higher proportion in the gender- and age-based patient distribution, while the number of female patients exceeded the number of male patients only in the patient group over the age of 65 (10). Like the literature, our study found the mean age of 74.2 years and a female portion of 56.1% among the transferred patients.

A study showed that patients frequently present to the emergency department with respiratory system-related complaints (9). In line with previous reports, our study found that the most common admission complaint was dyspnea. In our research, the most common emergency department admission complaints in descending order after dyspnea were abdominal pain, poor overall status, and seizure. In the literature, patients who were transported to the emergency department by ambulance mostly had a provisional diagnosis of trauma, while elderly patients were most commonly transported with cardiovascular system diseases (8,10-12). In our study, the patients transferred home had CVA (37.4%), malignancy (14.2%), and COPD (11%). As most patients who request home transport by ambulance are bedridden due to a history of CVA, our CVA rate was high.

When we examine the reasons for transferring patients from the emergency department to home by ambulance, 47.4% was due to being bedridden, 37.7% to social causes, and 14.9% to oxygen need. There are no studies in the literature on patients transferred home from the emergency department by ambulance to the best of our knowledge.

In a study on ambulance services in Ireland, 81% of the patients were transported from the scene to the hospital in under 15 minutes (13), while the average time was found to be 8.2 minutes in the USA (14). In our study, the meantime of home transport from the hospital was 51.6 minutes, and the mean transport distance was 15.9 km. No comparison could be made due to the lack of similar studies in the literature on home transport from the hospital; however, the transport time and distance may have been increased by an unknown destination and an insufficient supporting personnel in transport ambulances.

In the literature studies, 53.6% of patients were admitted to the emergency department between 16:00 and 08:00 (12), and a decrease in the number of patients presenting both by

ambulance and as an outpatient between 00:00 and 07:59 was reported (15). In our study, 42% of the patients admitted to the emergency department between 08:00 and 16:00; 39.9% between 16:00 and 00:00; and 17.7% between 00:00 and 08:00. These findings are consistent with the results reported by researches on hospital admission by ambulance.

## **Conclusion**

With the prolongation of human life, the number of elderly patients admitted to the emergency department is also increasing. However, patients demanding an ambulance for home transfer from the hospital increased. Providing ambulance service to special groups to reach home after discharge in the emergency department should be seen as a part of emergency treatment. To standardize patient transfers from hospital to home by ambulance, proper indications should be determined by regulations, and studies involving interdisciplinary cooperation should be carried out.

## **Ethics**

Ethics Committee Approval: This retrospective clinical study was approved by the Local Ethics Committee at XXXXXX (Decision number: 2020/41.-Date:02/03/2020) and conducted at XXXXXX University, Faculty of Medicine, Department of Emergency Medicine.

Conflict of Interest: No conflict of interest was declared by the authors.

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<b>Variables</b>		<b>n (%)</b>
<b>Gender</b>	Male	465 (43.9)
	Female	594 (56.1)
<b>Emergency Department Visit</b>	By ambulance	948 (89)
	By their own means	111 (11)
<b>Total</b>	<b>N</b>	<b>1059 (100)</b>
N: Number of case %: Percent		

## Tables

**Table 1: Distribution of Transferred Patients According to Gender and Emergency Department Visiting**

**Table 2: Complaints of Patients at the Emergency Department**

Complaints	N	%
Chills	7	0.7
Dyspnea	278	26.3
AbdominalPain	148	14.0
PEG Problem	66	6.2
EpilepticSeizures	71	6.7
Trauma	25	2.4
Dysuria	7	0.7
Cough	21	2.0
Fever	40	3.8
Hematuria	21	2.0
Headache	33	3.1
PoorOverallStatus	72	6.8
Nausea- Vomiting	47	4.4
Clouding of Consciousness	45	4.2
GIS bleeding	32	3.0
General Pain	50	4.7
Incontinence	25	2.4
Tachycardia	14	1.3
ChestPain	20	1.9
Lumbago	7	0.7
Agitation	18	1.7
Syncope	12	1.1
Total	1059	100,0
N: Number of case %: Percent PEG: Percutaneous Endoscopic Gastrostomy, GIS:Gastrointestinal system		



**Table3: Chronic Diseases of Patients**

Disease	N	%
CVA	396	37.4
COPD	116	11.0
LungCa	60	5.7
Alzheimer	57	5.4
CAD	49	4.6
Hip Fracture	42	4.0
Pancreatic Ca	33	3.1
Diabetes Mellitus	32	3.0
Stomach Ca	20	1.9
Epilepsy	20	1.9
HT	20	1.9
CHF	19	1.8
Other	125	13.4
Healthy	52	4.9
CVA :Cerebrovascular Accident COPD :Chronic Obstructive Pulmonary Disease Ca: Cancer, CAD: Coronary Artery Disease HT: Hypertension, CHF:Congestive Heart Failure		

**Table 4. Factors causing the transfer of patients from the emergency department to home by ambulance**

Transfer Request Reason Factors	N	%
Bedridden	502	47,4
Social Reasons	399	37,7
Need for Oxygen Support	158	14,9
<b>Total</b>	<b>1059</b>	<b>100,0</b>
N: Number of case %: Percent		

Uncorrected proof