

Analysis of Patient Transfers in and of Bolu Province of Turkey Performed by 112 Command and Control Center

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Abstract

Aim: In this study, we aimed to analyze patient transfers in and out of Bolu province of Turkey that were performed by 112 command and control centers and to contribute to the existing literature on this issue.

Materials and Methods: The gender, age, social security status of the patients, distribution according to the types of transport, distribution according to the places of residence, the time of arrival of the 112 teams to the cases, the personnel accompanying the patients, the units where the cases were admitted, and the results of the cases were recorded in the forms designed by the researchers.

Results: A total of 3,182 patients transferred by the 112 command and control centers in Bolu province were included in the study. Of all patients, 1287 (40.4%) were female, 1648 (51.8%) were male, and 247 (7.8%) were unspecified. The most common age range was 19-45 years. The mean arrival time was found as 7.53 ± 5.8 minutes (minimum: 0, maximum: 90). 83% (n=2641) of the transfers were performed without a physician, and 2048 (64.4%) had at least one paramedic.

Conclusion: The command and control centers being more selective about inappropriate calls will be effective in reducing the intensity of the emergency as well as preventing inappropriate ambulance use.

Keywords: Emergency, emergency department, 112, ambulance, patient transfer, paramedic

Introduction

Emergency services are the units assigned for the evaluation, diagnosis, medical intervention and treatment of the patient with the support of medical tools and equipment in order to protect the patient from disability or death in case of sudden illness, accident, injury and similar unexpected health problems (1). In another definition, emergency services are the most important units of hospitals where all kinds of emergency patients and injured people are cared for and provide uninterrupted service (2). Thus, emergency services create a system that provides urgent emergency medical care in response to individual and mass health and health-related emergencies (3). On the other hand, in Turkey emergency services are among the places visited frequented by patients who cannot be referred or whose referral is planned, drug addicts, forensic cases, patients whose injection and dressing time has come, and orphans when necessary. In

the emergency room, the team on duty must deal with these situations and provide emergency health services. Some of the patients presenting to the emergency room come with their own vehicles and facilities, while others use ambulances, referral from other health institutions, from their own homes, or by transfer from the scene (4).

The procedure of referral to other institutions is carried out if it is determined that the appropriate care, stabilization, and treatment of patients with life-threatening and disability risks cannot be carried out with the current medical technical facilities. The status of the patients to be transferred is reported to the 112 command and control center. In referrals in our country, deficiencies can be seen such as insufficient filling of epicrisis and not informing before sending. In addition, the second-level physicians giving instructions for the referral of the patients by phone instead of coming from their homes for the patients whose



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general condition deteriorates while they are in the wards and for the patients in the emergency services cause referral with inappropriate preliminary diagnoses (5).

In this study, we aimed to analyze patient transfers in and out of Bolu province of Turkey that were performed by 112 command and control centers and to provide a contribution to the existing literature on this issue.

Materials and Methods

This retrospective study was conducted to examine patient transfers made in and out of the Bolu province of Turkey by 112 command and control centers. The data used in our study were obtained from patient transfer forms in 112 command and control centers. Since the study was designed retrospectively, no informed consent was needed; however, the necessary permission was received from our hospital to use the study data.

The gender, age, social security status of the patients, distribution according to the types of transport, distribution according to the places of residence, the time of arrival of the 112 teams to the cases, the personnel accompanying the patients, the units where the cases were admitted, and the results of the cases were recorded in the forms designed by the researchers.

Data obtained in this study were interpreted in the light of the protocol for convenient and safe patient transfer between hospitals prepared by the The American College of Emergency Physicians, COBRA protocol, which determines the form that must be arranged in patient referral in the USA and the “Communiqué on Implementation Procedures and Principles of Emergency Services in Inpatient Health Services” which was issued in the Official Gazette dated 13 September 2022 and numbered 31952.

Statistical Analysis

Data obtained in this study were evaluated using Statistical Package for Social Sciences (SPSS) version 21.0 (SPSS, IBM Inc., Armonk, NY, USA). Continuous parameters were expressed as mean±standard deviation and categorical variables as frequency (n, %).

Results

A total of 3,182 patients transferred by the 112 command and control centers in Bolu province were included in the study. Of all patients, 1287 (40.4%) were female, 1648 (51.8%) were male, and 247 (7.8%) were unspecified. The patients were grouped according to age groups as 0-18, 19-45, 46-65 and ≥66 years old. The distribution of the age groups is given in Figure 1.

The majority of the patients had social security from the Social Security Institution (SSI). Very few cases were found to have no security. The security status of the transferred patients is given in Table 1.

The most common prediagnosis of the transferred patients was internal emergencies by 31.1% followed by trauma emergencies (30.0%) and psychiatric emergencies (11.2%). Prediagnosis groups of the transferred patients are presented in Table 2.

According to the distribution of transfer types, 2170 (68.2%) patients were transferred from the field to the hospital, while 398 (12.5%) rejected being transferred. The distribution of the transfer types is given in Table 3.

When the arrival time of the 112 teams to the scene was examined, the average arrival time was found to be 7.53±5.8 minutes (minimum: 0, maximum: 90) in 2907 cases in which arrival times were stated in the forms. The arrival times of 112 teams to the scene are given in Table 4.

When the personnel accompanying the patient in the case transfer was examined, it was determined that 83% (n=2641) of the transfers were performed without a physician, and 2048 (64.4%) had at least one paramedic. When the distribution of the patients who were referred to the hospital by the 112 teams

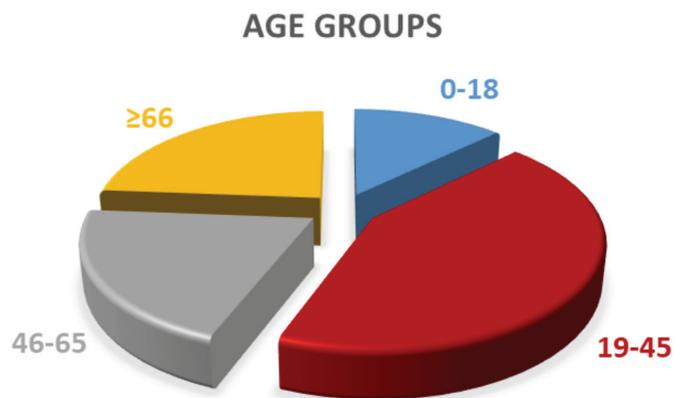


Figure 1. Age distribution of the patients

	n	%
SSI*	2339	73.5
Greencard	136	4.3
No security	22	0.7
Other**	481	15.1
Unspecified	204	6.4
Total	3182	100.0

*Social security covers retirement fund, bagkur and SSI patients.
**Social security includes private health insurance and foreign insurance.
SSI: Social Security Institution

according to the institution or unit they were admitted to was examined; 34.9% (n=1104) of the cases were admitted to the emergency service of the state hospital, 20.4% (n=643) of the cases were accepted by the medical school emergency service,

	n	%
Internal emergencies	991	31.1
Traumatic emergencies	792	30.0
Psychiatric emergencies	357	11.2
Cardiovascular system emergencies	315	9.9
Neurologic emergencies	246	7.7
Normal physical examination	109	3.4
Intoxications	91	2.9
Gynecologic emergencies	43	1.4
Arrest cases	28	0.9
Patients transferred to home or hospital	18	0.6
Unspecified	190	6.0
Total	3182	100.0

	n	%
Transfer from the scene to the hospital	2170	68.2
Transfer rejection*	398	12.5
Transfer between hospitals	110	3.5
The case that does not require referral as a result of the evaluation	77	2.4
Transfer from the hospital to the home	75	2.4
Exitus-leaving in the scene	9	0.3
Other	220	6.9
Unspecified	123	3.9
Total	3182	100.0

*Transfer rejection of transfer: The patient who is thought to be transferred to the hospital by the health teams, but does not accept the transfer to the hospital voluntarily

Time (minute)	n	%
0-5	1163	36.5
6-10	1175	36.9
11-15	351	11
16-20	125	3.9
21-25	50	1.6
26-30	23	0.7
31-35	4	0.1
36+	16	0.5
Unspecified	275	8.6
Total	3182	100.0

177 (6.6%) cases by the outpatient clinics of the state hospital, and 47 (1.5%) by the medical faculty outpatient clinics, while institution or unit of admission were not recorded in the form in 35% (n=1130).

Of all patients, pupil status was normal in 2853 (89.7%) and skin findings in 2122 (77.1%).

The Glasgow coma scale (GCS) response was 6 in 85.2%, the GCS verbal response was 5 in 84.1%, and the GCS visual response was 4 in 86% of the patients transferred by 112 teams.

Discussion

In this study, we investigated the characteristics of patient transfers performed by the 112 command and control center in Bolu province of Turkey. In our study, 1287 (40.4%) of the cases evaluated from 112 teams were female and 1648 (51.8%) were male. In a study conducted at Firat University, 39.5% of the patients brought to the emergency room by ambulance were found to be female and 60.5% male (6). In another study by Rızalar and Öztürk (7) investigating the characteristics of ill/injured patients admitted to the emergency service 112, 71% of the patients were male and 29% were female. In a study by McCaig and Burt (8), 44% (n=2192) of the patients who presented to the emergency department were male and 56% (n=2808) were female. In the study by Edirne et al. (9), 43.2% of the patients were male and 56.8% were female. In another study by Oktay et al. (10), 43.5% of the patients who presented to the emergency department were male and 56.5% were female. In a recent study by Hong et al. (11) in 2022, 49.9% of the patients presenting to the emergency department were male and 50.1% were female. In general, while the female gender is more common among the patients admitted to the emergency department, the male gender is more common among the patients brought by ambulance, as in our study.

Age is an important factor for emergency medical system demand. Emergencies such as hypertension, coronary artery diseases, chronic obstructive pulmonary disease, neurovascular disease, and trauma that require ambulance use increase as patients get older (12). In our study, when the distribution of the cases according to age groups was examined; 394 (12.5%) of them were in 0-18 age group, 1327 (41.7%) in 19-45 age group, 626 (19.7%) in 46-65 age group, and 732 (23.0%) aged 66 years and over. In Atilla et al. (13), it was found that 38.7% of the presenting patients were between the ages of 17 and 44. In another study of the characteristics of patients presenting to the academic emergency department, the most common age group was 18-20 years (14). In another study by Köse et al. (15), when the distribution of patients admitted to the emergency department

by age groups was examined, it was seen that the most common group was between the ages of 17-65 with 77% followed by 1-16 age group with 14.7%, >65 age group with 7.1%, and 0-1 age groups with 1.2%. As seen in our study and other studies, the rate of using emergency services increases in parallel with increasing age.

In our study, when the cases were evaluated according to their social security status, 2339 (73.5%) of the cases had SSI, 136 (4.3%) had green card, 22 (0.7%) had no security, and 481 (15.1%) had other security systems (private insurance, foreign insurance). The social security status of 204 (6.4%) patients was not specified. In a study by Polat et al. (16) with the patients who presented to the Emergency Department of Ankara University Faculty of Medicine, Ibn-i Sina Hospital, 89% had retirement fund, 5% had SSI, 4% were paid patients, and the remaining 2% had medico-social, Bağkur, and green card systems. In some studies, the absence of social security has been identified as a factor that may lead to inappropriate use of emergency services (17). The reason for the social security difference between regions may be related to the socioeconomic and cultural development of the region where the hospital is located. However, free emergency services may be the reason for those without social security to use emergency services.

In our study, when the distribution of the cases according to the transfer type was evaluated, 2170 (68.2%) of them were referred to the hospital from the scene, while 398 (12.5%) rejected the transfer. Transfer rejection rates were mostly found in psychiatric emergencies, including conversion prediagnosis. In a study conducted in Izmir, the rate of transfer to hospital was 51.6%, the rate of on-site intervention was 18.6%, and the transfer rejection rate was 1.2% (18). In the present study, in 77 (2.4%) of the cases, there was no need for referral from the field to the hospital as a result of the treatment/evaluation performed at the scene. The fact that 15% of the evaluated cases are those who refuse transfer and patients who do not need to be referred to a health institution with simple medical intervention may suggest the unnecessary use of ambulance services. The inappropriate use of emergency services makes it difficult to guarantee access for real emergency cases, producing negative spillover effects on the quality of emergency services and raising overall costs (19). Inappropriate presentations to emergency services lead to loss of time, excessive workload, and attention in the health care team, and create an obstacle to giving the necessary time and attention to real emergencies. Inappropriate use rates of ambulances were found to be 34-51% in England, 42% in Canada, 11% in New York, and 30% in Baltimore (13).

In our study, when the GCS of the transported patients was evaluated, it was found that GCS motor response was normal in 85.2%, GCS verbal response in 84.6%, and GCS visual response in 86% of the patients. We believe that this high normal rate in the

first examination findings of the transported patients supports the inappropriate use of ambulances.

The time to reach the scene where the intervention will be performed is very important in prehospital care. When the transportation time of the ambulances to the cases was evaluated in our study, it was seen that the ambulances reached the scene in the first 10 minute with a rate of 73.4%. In a study by Zenginol et al. (20) in Gaziantep province, the rate of the transportation time of ambulances to the case <10 minutes was determined as 75.6% in 2007 and 79.9% in 2008. Experts reported that it is possible to save at least 20% of those who lost their lives with conscious, quality, accurate and fast emergency aid services (21).

Health personnel accompany the patient in patient transport from the scene and in other referrals. Making the patient transfer with a vehicle that does not offer medical treatment and without accompanying health personnel may endanger the life of the patient and this situation may prepare the ground for medical and legal complaints (5). In our study, 64.4% of the patients were accompanied by paramedics and 18.6% by health personnel. The rate of teams with a physician was 14.6%. In the study conducted by Yıldız and Durukan (6), it was shown that most patients were not accompanied by physicians or other healthcare personnel, regardless of their diagnosis. In our study, the rate of at least 2 or more health personnel accompanying the cases was found to be 78.8%, which may be an indication of improvement in ambulance services.

In our study, the most common prediagnosis was internal emergencies with 31.1%, followed by traffic accidents, trauma, and surgical emergencies with 30%, psychiatric emergencies with 11.2%, and CVS emergencies with 9.9%. In a study by Kimaz et al. (21), trauma patients were in the first place as a preliminary diagnosis, followed by CVS emergencies. In a study by Oktay et al. (10) the most common preliminary diagnosis was trauma (33.1%) followed by CVS emergencies (18.5%), neurologic emergencies (14.2%) and psychiatric emergencies (10.5%).

Study Limitations

The major limitation of this study is its retrospective design. In addition, since the study was conducted in Bolu province alone, our results can not be generalized to the whole country. As strength, our number of cases is relatively high for such studies. We believe that our results will contribute to the existing literature on this issue.

Conclusion

In our study, we found that 92.9% of the cases using ambulance services had health insurance. The high GCSs of the patients

transported in the ambulance and the transportation of most cases without additional medical treatment may be an indication of inappropriate use of ambulance services. The command and control centers being more selective about inappropriate calls and the ambulance team being more careful in the selection of cases that need to be referred to the hospital will be effective in reducing the intensity of the emergency as well as preventing inappropriate ambulance use.

Ethics

Ethics Committee Approval: The study was approved by the Abant İzzet Baysal University of Local Ethics Committee (protocol no: 2012/239, date: 20.12.2012).

Informed Consent: Retrospective study.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: B.B., T.K., Concept: B.B., T.K., Design: B.B., T.K., Data Collection or Processing: B.B., Analysis or Interpretation: B.B., Literature Search: B.B., T.K., Writing: B.B., T.K.

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

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