

## Original Paper

## Evaluation of Patients' Referral Causes to the Emergency Department

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## ABSTRACT

**Background and Objectives:** Proper management of resources and patients in emergency departments (ED) is the main priority of the hospitals. By investigating patient referrals to our ED during 5 years, we tried to help making policies about development and management of ED. **Methods:** In this cross-sectional descriptive study, data pertaining to etiology of admission and final discharge of patients were collected through medical record review (HIS) from 2011 to 2015, and analyzed utilizing SPSS software. **Results:** 444552 patients were referred to our ED among whom 22.37% were outpatients. The most common indications for admission were trauma (37.97%), abdominal pain (20.63%), headache (10.59%) and CVA impression (3.59%). 25.92% of patients had personal consent to leave the ED without being visited (Left Without Being Visited: LWBV) by a physician. Mortality rate was 0.76% in five years. Trauma was the most common cause of death in first three years (25.87%, 20.90% and 20.07%, respectively); and decreasing level of consciousness was the most common cause of death in last two years (22.89% and 30.40%, respectively). **Conclusion:** Considering safety and patient's satisfaction as two factors determining quality of emergency care, these findings reveal the need for reducing LWBS (by improving communication skills and quality of care) and lowering the incidence of mortality and morbidities (by improving diagnostic and therapeutic skills).

## INTRODUCTION

Healthcare systems of all countries have complicated and expanded structures, consisted of hospitals, clinics, diagnostic departments, doctors, nurses, pharmacists, statistical systems and health care information of each country (4, 5). Nowadays Emergency department is defined as the mainstay of health care system and its promotion and improvement is the main goal of health care system in all countries (6). About 25% of referrals and hospital admissions are done in the emergency department with 40% of patients being admitted into the clinical wards after referring to the emergency department (3). Appropriate approach on the right time can reduce rate of mortality and morbidity of the patients (7). Quality of service providing and behavior with patients in the emergency department is the symbol of overall services in the hospital. This important concept has a tight relationship with choosing the qualified management, health care workers, and facilities in emergency departments (8). Way of providing services to the patients and its quality is one of the most remarkable factors of patient's satisfaction who refer to emergency departments. (9). Managers of emergency departments with high

patients' turn over may have hard time without appropriate plan to manage patients. It might lead to longer waiting time and dissatisfy patients (10). Evaluating and well-controlled consistent management leads progression and better way of behaving with patients who refer to emergency department and increase public confidence in the performance of this sector (11). Due to increasing amount of referral patients to the emergency, importance of consistent promotion of quality of services, increasing public confidence and satisfaction leads to exact evaluation and investigation of referral patients and way of providing services (8, 12). According to evaluating of referral patients, suitable planning for management with the goal of public satisfaction and confidence, health care system promotion, the purpose of our study is demographic investigation of patients who refer to Imam Reza Hospital of Tabriz University of Medical Sciences in recent 5 years.

## METHODS AND MATERIALS

**Population:** This is a cross sectional and a prospective study. All patients referring to Imam Reza hospital emergency of

Tabriz University of Medical Sciences during recent 5 years from 2010 till 2015 were studied and investigated. Factors of entering to this study included all patients referring to Imam Reza Hospital of Tabriz University of Medical Sciences in recent 5 years, and all data were extracted from HIS system of hospital.

*Design:* According to the type of study and investigating all patients referring to the emergency department, defaced data in HIS system were went out from our study. Information of patients referring to emergency of Imam Reza hospital in recent 5 years was consisted of the reason of admitting (illness or trauma) and discharge from emergency which were noted. Due to sampling, population of data were consisted of all patients referring to emergency department of Imam Reza hospital was 444552 during 2010 to 2015 who were studied.

*Statistical analysis:* All data were analyzed by SPSS version 22 software, and then were reported as descriptive statistics (mean, percent).

## RESULT

Total admitted patients in emergency department of Imam Reza hospital in recent 5 years were 444552 (the average: 88910.4 patients) (Table 1). 22.37% of them were treated outpatients whereas 48.16% with medical problems and 29.47% with trauma were treated inpatients and admitted in the emergency. Frequency of outpatients from 2010 till 2015 were respectively 22.48%, 19.84%, 16.87%, 19.24%, 33.72%. Frequency of inpatients with medical problems from 2010 till 2015 were 48.22%, 49.65%, 51.62%, 51.28%, 39.10% respectively. Frequency of inpatients with the reason of trauma from 2010 to 2015 were

respectively 28.60%, 30.51%, 31.51%, 29.48%, 27.18%. The most common reason of admission in emergency room of Imam Reza hospital from 2010 till 2015 was trauma with the frequency of 36.90%, 38.06%, 37.90%, 36.50%, 41.01%. Other medical reason leading to admission, were pain in abdomen with frequency of 23.18%, 19.66%, 19.54%, 18.65%, 22.67% respectively during each year of 2010 till 2015. Headache and CVA were the other reasons of admission. (Table 2)

Many of the patients who were admitted in the emergency of Imam Reza hospital from 2010 to 2015 were discharged after primary cares (66.985%, 62.37%, 56.37%, 62.07%, 63.45%). About a quarter of them (25.92%) left the emergency with personal consent. Maximum frequency of admission was in 2012 (31.79%), whereas the minimum was in 2010 (20.78%). Prevalence of mortality in emergency room of Imam Reza hospital in recent 5 years was 0.76%, although it had been increasing from 2010 to 2015 (0.59%, 0.60%, 0.70%, 0.84%, 1.16%). (Table 3)

The most common reason of mortality in the patients who has been admitted in the Imam Reza hospital in recent 5 years was related to trauma (16.94%). The most common reason of mortality in 2010, 2011, 2012 was trauma (25.78%, 20.90%, 20.07%), whereas in 2013 and 2014 loss of consciousness as a medical reason (22.895, 30.40%) was the most common reason of mortality. The other reasons of mortality in recent 5 years were pulmonary embolism and CVA (11.75%, 6.74%). (Table 4)

## DISCUSSION

The total number of admitted patients in emergency department of Imam Reza hospital was 444552 in recent 5 years

**Table 1.** Emergency department reception during five years, Imam Reza Hospital, Tabriz

Reception	2011		2012		2013		2014		2015		Five years	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Outpatient	19866	22.48	18236	19.84	14932	16.87	17055	19.24	29375	33.72	99464	22.38
Inpatient												
Medical	43232	48.92	45624	49.65	45685	51.62	45469	51.28	34058	39.10	214068	48.15
Trauma	25275	28.60	28040	30.51	27886	31.51	26139	29.48	23680	27.18	131020	29.47
Total	88373	100.0	91900	100.0	88503	100.0	88663	100.0	87113	100.0	444552	100.0

**Table 2.** Etiologies of admission in emergency department during five years, Imam Reza Hospital, Tabriz

Etiology	2011		2012		2013		2014		2015		Five years	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Trauma	25275	36.90	28040	38.60	27886	37.90	26139	36.50	23680	41.10	131020	37.97
Abdominal pain	15880	23.18	14483	19.66	14375	19.54	13357	18.65	13091	22.67	71186	20.63
Headache	8667	12.65	7946	10.97	7660	10.41	6077	8.49	6185	10.72	36535	10.59
CVA impression	3168	4.62	2877	3.91	2597	3.53	1939	2.71	1815	3.15	12396	3.59
Other	15517	22.65	20598	27.96	21053	28.62	24092	33.65	12967	22.46	94231	27.32
Total	68507	100.0	73664	100.0	73571	100.0	71608	100.0	57738	100.0	345088	100.0

CVA: cerebrovascular accident

**Table 3.** Final disposition of patients in emergency department during five years, Imam Reza Hospital, Tabriz

Final disposition	2011		2012		2013		2014		2015		Five years	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Discharge	45887	66.98	45941	62.37	41469	56.37	44447	62.07	36634	63.45	214378	62.12
LWBS	14239	20.78	18830	25.56	23388	31.79	19028	26.57	13968	24.19	89453	25.92
Death	402	0.59	445	0.60	518	0.70	603	0.84	671	1.16	2639	0.77
ICU admission	549	0.80	555	0.75	585	0.79	532	0.74	554	0.96	2775	0.80
Transfer	7430	10.85	7893	10.72	7611	10.35	6998	9.78	5911	10.24	35843	10.39
Total	68507	100.0	73664	100.0	73571	100.0	71608	100.0	57738	100.0	345088	100.0

ICU: intensive care unit; LWBS: left without being seen

**Table 4.** Etiologies of inpatients' mortality in emergency department during five years, Imam Reza Hospital, Tabriz

Etiology of death	2011		2012		2013		2014		2015		Five years	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Trauma	104	25.87	93	20.90	104	20.07	84	13.93	62	9.24	447	16.94
LOC	0	0	0	0	31	5.98	138	22.89	204	30.40	373	14.13
PTE	44	10.94	59	13.26	57	11.00	64	10.61	86	12.82	310	11.75
CVA	42	10.45	26	5.84	49	9.46	26	4.31	35	5.22	178	6.74
Hypotension	23	5.72	39	8.76	39	7.53	18	2.98	7	1.04	126	4.77
Acute abdomen	20	4.97	25	5.62	22	4.25	27	4.48	28	4.17	122	4.62
Headache	18	4.48	24	5.39	19	3.67	16	2.65	13	1.94	90	3.41
Hypertension	22	5.47	24	5.39	18	3.47	0	0	0	0	64	2.42
Hemorrhage	3	0.75	6	1.35	6	1.16	7	1.16	13	1.94	35	1.33
Cardiac arrest	14	3.48	8	1.80	6	1.16	4	0.66	1	0.15	33	1.25
Septic shock	8	1.99	5	1.12	6	1.16	1	0.17	6	0.89	26	0.98
Heart failure	8	1.99	2	0.45	2	0.39	4	0.66	2	0.30	18	0.68
Pneumonia	4	0.99	1	0.22	1	0.19	0	0	0	0	6	0.23
Other	92	22.89	133	29.89	158	30.50	214	35.49	214	31.89	811	30.73
Total	402	100.0	445	100.0	518	100.0	603	100.0	671	100.0	2639	100.0

CVA: cerebrovascular accident; LOC: loss of consciousness; PTE: pulmonary thromboembolism

(annual average: 88910.4). 22.37% were treated as outpatients whereas 48.16% and 29.47% were admitted to inpatients because of medical problems and trauma respectively. Rate of admitting in Imam Reza hospital was twice more in comparison to another study (3). ED crowding and mismatch between the number of doctors and patients leads reduction in quality of health care services and loss of patient's satisfaction (5, 11, 14). From the year of 2010 to 2015 most of the admitted patients in emergency room of Imam Reza hospital were discharged after primary cares (They were 66.98%, 62.37%, 56.37%, 62.07% and 63.45% respectively). Not admitting non-emergent patients and transferring dischargeable patients to other wards lead to lower rate of discharge, quick decision making, and discharging high risk patients makes number of discharges high. Trauma, abdominal pain, and headache are the most common causes of admitting in the emergency room of Imam Reza hospital in recent 5 years (37.97%, 20.63%, 10.59% respectively). Evaluation of demographic features, age and sex distribution of patients

in emergency is very valuable. One out of every four patients who referred to the emergency (25.99%) left hospital with personal consent (left without being seen: LWBS). This ratio may increase by low patient satisfaction because of long waiting time, lack of appropriate facilities, low quality of healthcare services (5, 10). Some researchers believe in having good communication with patients in emergency waiting rooms are effective in reducing rate of leaving hospital with personal consent (6). Mortality rate of emergency room in Imam Reza hospital in recent 5 years was 0.76% however it had an increasing trend in rates (from 0.59% to 1.16%). Inadequate equipment, crowded emergency rooms, low ratio of doctors to the patients, medical errors, lack of control on medical residents' management are associated with high mortality rate (11,14). The most common causes of mortality rate in emergency department of Imam Reza hospital in recent 5 years was trauma (16.94%). The most common cause of mortality in 2010, 2011, 2012 were trauma with the frequency of 25.87%, 20, 90%, 20.07% respectively, whereas

in 2013 and 2014 loss of consciousness with frequency of 22.89% and 30.40% was the most important reason of mortality. Pulmonary embolism and CVA (11.75%, 6.74%) were the other reasons of mortality. In Green et al study in 2008, 25% of hospital referral and admissions were done through emergency department. About 40% of patients has been admitted in the wards after referring to the emergency room (3). In Buckley et al study in 2010, investigating waiting time in emergency room (express admit unit), revealed that there is significant relationship between length of stay in ED and waiting time and patients' flow in the ward (4). In Lee and et al study in 2006 demonstrated that patients who leave emergency room with personal consent are often men who has been waiting more than 130 minutes in waiting rooms. They also believe in good communication with patients is effective in reducing rate of patients who leave emergency with personal consent (6). Betz et al study in 2014 showed that rate of acute injuries is increasing with age and a quarter of elderly traumatized patients are admitted through emergency room (7). Shams et al study in 2013 indicates rate of satisfaction is not related to sex and health insurance, whereas it is correlated with education level and frequency of hospital admission. Public satisfaction from health care services is increasing by age, although there are decreased satisfaction from hospital facilities and space (8). Soleimanpoor et al. study in 2012 about public satisfaction in emergency of Imam Khomeini hospital of Tabriz, demonstrated that less waiting time, helping patients to understand the meaning of "waiting" in emergency room and cleanliness and hygiene of the emergency department may increase rate of patient satisfaction (9). Cassidy Smith et al study in 2007 investigating throughput time, expectation and public satisfaction, found out that by increasing through put time more than expectation, patients' satisfaction is reducing (10). Malek Makan et al. study in 2010 demonstrated ED cleanness, respecting patients' physical space and continuous monitoring lead to high public satisfaction (11). Reid et al study in 1999 investigated hospital admission in London. According to this study 45% of admitting was related to emergency room. Reason of admitting had a significant difference related to each area (13). In a study by Jarman et al. in 1999 mortality rate of 4 years after discharging from hospital in England has been increased from 3.4% to 13.6% (the average: 8.5%). The most important reason in mortality rate was emergency room admission (14). In McDonald et al. study from 1993 to 2004 about admitting patients with atrial fibrillation showed that admitting patients with AF diagnosis has increased in recent 10 years (15).

In conclusion, considering safety and patient's satisfaction as two factors determining quality of emergency cares, reveal the need for reducing LWBS (by improving communication skills and quality of cares) and lowering the incidence of mortality and morbidities (by improving diagnostic and therapeutic skills).

#### ETHICS COMMITTEE APPROVAL

Ethics committee approval was received for this study from the ethics committee of Tabriz university of medical sciences. (89/1-5/10)

#### AUTHOR CONTRIBUTIONS

Concept and analysis -S.O, supervising and Critical reviews-S.S.V, Data collection- R.Z, Writing-R.F

#### CONFLICT OF INTEREST

No conflict of interest was declared by the authors.

#### FINANCIAL DISCLOSURE

The authors declared that this study has received no financial support.

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