

## Original Article

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## The Cost of Leaving the Emergency Department without Notice; a Cross-sectional Study

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### Abstract

**Introduction:** Leaving the hospital without notice is among the problems that can inflict financial and non-financial burdens on the health care system of a country.

**Objective:** The present study was carried out with the aim of evaluating the prevalence of leaving without notice cases in the emergency department (ED) of one of the major teaching hospitals of Tehran affiliated with Shahid Beheshti University of Medical Sciences and calculating the direct costs resulting from it.

**Methods:** This study was a retrospective cross-sectional one carried out during 1 year from 2016 to 2017 in one of the teaching hospitals of Tehran affiliated with Shahid Beheshti University of Medical Sciences. Sampling was performed via census method and the study population consisted of the profiles of all the patients who had left the hospital without notice or checking out after being admitted to the hospital. To gather the required data for this study, a checklist consisting of questions regarding sex, age, insurance coverage, and the amount of money they owed the hospital was used. Statistical analysis was performed using the software IBM Statistics for Windows v22 and P-value<0.05 was considered significant.

**Results:** Out of the total of 39946 patients visiting the ED of the studied hospital during 1 year, 1692 (4.2%) had left the hospital without checking out. Below 30 years age range was the most common age range with 46.9% (794 patients) and 72.9% of the patients leaving without notice were men. Based on the findings obtained, male patients without insurance coverage had attempted to leave the hospital without notice more than others (p<0.001). The total cost inflicted by leaving without notice throughout the studied year was 1,755,286,279 Rials, which is equal to 0.0059 of the total annual income of the ED.

**Conclusion:** Throughout the year this study was performed, a total of 1.2% of all the visitors of the ED of a hospital affiliated with Shahid Beheshti University of Medical Sciences left the hospital without notice or checking out, which inflicted a considerable cost on the ED.

**Key words:** Absconding; Costs and cost analysis; Emergency service, hospital; Health care costs; Health expenditures

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### INTRODUCTION

Leaving the hospital without notice is among the problems that can inflict financial and non-financial burdens on the health care system of a country. This case has been evaluated by researchers from many countries over numerous years and many studies have been done on the causes and patterns and the costs it inflicts on the health care system and the society (1-3). In the studies performed until now, it has been determined that cases of leaving without notice are highly prevalent among patients hospitalized in psychiatry wards of the hospitals and most of the studies carried out in this regard have been done on these patients. Emergency department (ED) also

has a high rate of leaving without notice, which seems to be logical considering the nature of patients in this department (4-6). The present study was carried out with the aim of evaluating the prevalence of leaving without notice cases in the ED of one of the major teaching hospitals of Tehran and calculating the direct costs resulting from it.

### METHODS

#### Study design

This study was a retrospective cross-sectional one carried out during 1 year from 2016 to 2017 in Imam Hossein Hospital, one of the hospitals

affiliated with Shahid Beheshti University of Medical Sciences, Tehran, Iran. The study protocol was approved by the Ethics Committee of Shahid Beheshti University of Medical Sciences and the code IR.SBMU.MSP.REC.1396.247 assigned to it. Necessary coordination for data gathering was done with the management of the hospital. Ethical principles, including confidentiality of the studied patients' names, were adhered to throughout the study period.

### Study population

In the present study, sampling was performed via census method and the study population consisted of the profiles of all the patients who had left the hospital without notice or checking out after being admitted to the ED. Cases that had checked out by returning to the hospital were excluded from the study.

### Data gathering

To gather the required data for this study, a checklist consisting of questions regarding sex, age, insurance coverage, and the amount of money they owed the hospital was used. The data of all the enrolled patients were extracted from their medical profiles.

### Statistical analysis

Statistical analysis was performed using the software IBM Statistics for Windows v22. To describe continuous variables, mean, standard deviation (SD), median, and the mid-quartile range were used. To describe categorical variables, frequency and percentage were applied. After performing analyses, data were presented as appropriate tables and charts. Additionally, P-value<0.05 was considered significant.

## RESULTS

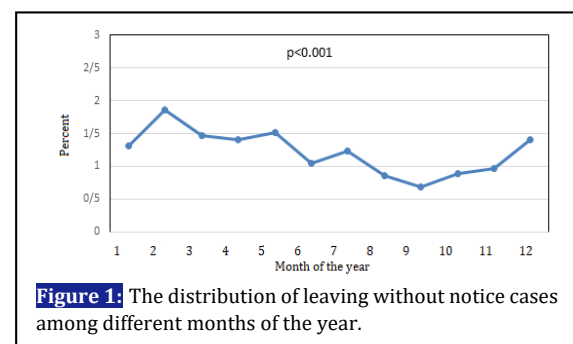
Out of the total of 39946 patients visiting the ED of the studied hospital during 1 year, 1692 (4.2%) had left the hospital without checking out. Their mean age was  $29.4 \pm 9.7$  years. Demographic data of the studied patients has been summarized in table 1. Among the visitors who had left the hospital without notice, 794 (46.9%) cases were in the below 30 years age group. Almost 27.1% of the leaving without notice cases in the studied ED were women and 72.9% were men. Based on the obtained results, there was a significant statistical

**Table 1:** Demographic and baseline characteristics of the studied population

Variable	Number (%)	P
<b>Sex</b>		
Male	1234 (72.9)	<0.001
Female	458 (27.1)	
<b>Age (year)</b>		
<30	794 (46.9)	<0.001
31-50	520 (31.1)	
>50	378 (22.0)	
<b>Insurance</b>		
Yes	735 (43.4)	<0.001
No	957 (72.1)	

correlation between sex and leaving without notice and these cases were more prevalent among men ( $p<0.001$ ). More than half of the patients who had left the hospital without checking out (56.6%) did not have insurance coverage ( $p<0.001$ ). The status of insurance coverage among the patients presenting to the ED based on checking out or not checking out when leaving the hospital is shown in table 2. The ratio of patients who did not have insurance coverage was significantly higher among patients leaving without notice compared to discharged patients ( $p<0.001$ ). Figure 1 depicts the frequency of cases leaving the hospital without notice in various months of the year. Based on these findings, the most and least cases of leaving without notice happened in 2<sup>nd</sup> and 9<sup>th</sup> month, respectively. The percentage of leaving without notice cases among all the visitors in one month had a significantly decreasing trend during the final months of the year ( $p<0.001$ ).

The sum of direct costs caused by leaving without notice during the year was 1,755,286,279 Rials, which is equal to 0.0059 of the total annual income of the ED.



**Figure 1:** The distribution of leaving without notice cases among different months of the year.

**Table 2:** The status of insurance coverage of the patients visiting the studied emergency department based on checking out or not checking out when leaving the hospital

Checking out when leaving the hospital			
Insurance coverage status	Leaving after checking out (n=38245)	Leaving without checking out (n=1692)	p
	Number (%)		
Without insurance	9266 (24.2)	957 (56.6)	<0.001
With insurance	28979 (75.8)	735 (43.4)	

## DISCUSSION

During the year of the study, the ratio of leaving without notice cases to all of those who visited the ED of Imam Hossein Hospital was 4.2% and in total, the considerable cost of 1,755,286,279 rials was inflicted on the hospital.

In a study carried out in one of the major teaching hospitals of Tehran by Zarei et al. this rate was reported as 2.4% (7). Memarian et al. also performed a similar study in 2013 and in Hazrate Rasoul Hospital in Tehran and reported the rate of leaving without notice as 1% among the visitors (8).

In a multi-centric study carried out by Hsia et al. in 262 hospitals in California in 2011, the prevalence of absconding varied between 0% and 20.3%, the mean rate of which was reported as 2.6% and additionally, the number of cases who did not have insurance was reported to be higher among those who left the hospital without notice, which were in line with the findings of the present study (9).

Age distribution of the patients who had left the hospital without the treatment team and officials noticing, either from ED or other departments has been assessed in various studies both in Iran and internationally and it has been reported that most of these patients are in the young adult age group. In the present study the highest number of runaway patients were in the below 30 age group and with increase in age, the number of these patients also decreased. Considering the physical strength and boldness of young people as well as the higher probability of not being under insurance coverage in younger age, these results regarding running away from the hospital seem logical (1, 4). Sex distribution of the patients presenting to ED based on the status of leaving without notice is another point that has been evaluated in previous studies. In almost all of the studies that we evaluated in our comparative study, men made up a larger portion of the patients who had left without notice. For example in a study by Falkowski et al. in 1990, and in one performed by Nilson in 1996 from 60% to more than 90% of the patients who left without notice were men (10, 11). In other studies, the timing pattern of leaving the hospital without notice were also assessed and the higher rate of leaving the hospital without notice was seen at night as well as the when the staff were changing shifts. In the present study, the timing pattern of leaving without notice was observed during each month and the percentage of these cases to all the visitors of the ED in one month showed a decreasing trend in the final months of the year. Monthly statistics of leaving without

notice cases shows that the lowest rate belongs to December with 0.7% and the highest rate belongs to May with 1.9%. Other studies performed in Iran also indicate similar percentages (7, 8).

Insurance status is among other factors that be considered as an effective factor in this regard. In the present study, the ratio of patients who did not have insurance was higher than those with insurance among cases who left the ED without notice. Just like Zarei et al. study that had reported the higher number of leaving without notice cases in the group without insurance. This might be explained by considering the probably high cost of treatment for patients without insurance (7).

The burden that leaving the hospital without notice inflicts on the country's health care system has various aspects. In the present study, only the direct costs, which consist of the costs of treating the patients who left the hospital without paying them, were considered. In a study by Zarei et al. performed about 2 years before the present study, the total expenses for these patients was calculated as 1,122,097,212 Rials, in our study the cost was similar and the ratio of the cost of leaving without notice cases to the total visits to the ED of Imam Hossein Hospital in the studied year was less than 1% (7).

Considering the afore-mentioned points, it seems that the results of the present study does not contradict other studies that have been done both inside and outside Iran and is in line with them. Considering the social and economic outcomes of this misbehavior on the health care system, the society and the patients themselves, high-rank officials of the healthcare system can consider the affecting factors and provide solutions for decreasing these cases and the harm caused by them.

## Limitations

In this study, statistics and data were only briefly analyzed and separating the patients based on type, chief complaint, bed occupation rate in the ED, and other indices can help in better analysis in this regard.

## CONCLUSIONS

Throughout the year this study was performed, a total of 4.2% of all the visitors of the studied ED left the hospital without notice or checking out, which inflicted a considerable cost on the ED.

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#### AUTHORS' CONTRIBUTION

All the authors met the standards of authorship based on the recommendations of the International

Committee of Medical Journal Editors.

#### CONFLICT OF INTEREST

None declared.

#### FUNDING

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