

INAPPROPRIATE ADMISSION AND HOSPITALIZATION IN TEACHING HOSPITALS OF TEHRAN UNIVERSITY OF MEDICAL SCIENCES, IRAN

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ABSTRACT

Objective: To determine the appropriateness of admission and hospitalization of patients in two major teaching hospitals of Tehran University of Medical Sciences (TUMS).

Methodology: Appropriateness Evaluation Protocol was employed to evaluate 1732 days of hospital stay and 258 patient admissions.

Results: Findings indicated that 22.8% of admissions were inappropriate and length of stay for patients who had inappropriate admissions was significantly shorter than those who had appropriate admission. Statistical tests demonstrated a significant difference between hospital wards in terms of inappropriate admission ($p < 0.0001$). On average 8.6% of patient days were inappropriate and it is significantly different between two hospitals. It was also found that the more patient length of stay, the more inappropriate patient day. Delay in discharge process was the most frequent reason indicated for inappropriate hospital stay.

Conclusions: A substantial proportion of hospital admissions and stays were found to be inappropriate due to management procedures and more likely lack of health care services in lower level of health system.

KEY WORDS: Appropriateness Evaluation Protocol (AEP), Inappropriate hospital stay, Inappropriate admission.

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INTRODUCTION

In all health care systems, the use of hospital beds is a concern for policy-makers, managers and practitioners.¹ For several years hospital

managers have been under pressure to reduce hospital expenditures since it is the largest single source of health service expenditures in most countries and it is estimated 50% to 80% for Iran.² On the other hand, numerous studies have documented that hospital admissions and inpatient days may be inappropriate or unnecessary in certain situations.³⁻⁸ Thus improving the efficiency of hospital services by a preventive strategy for inappropriate hospital admission and stay can lead to increase the productivity of the hospital and reduce the waiting list, and finally optimal use of existing health care facilities without compromising quality of care.^{9,10} Furthermore, hospital environments increase the risk of Hospital Associated Infection (HAI) for many reasons so, longer exposure to hospital environment may cause higher rate of HAI.¹¹ Eliminating inappropriate hospital stay decreases hospital costs

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and the risks of nosocomial infection and leaves available resources for patients with more critical conditions.

Studies on over-hospitalization have relied on measurement of unnecessary hospital admissions and Inappropriate Patient Days (IPD). Appropriate admission is defined as "those patient for whom there is no alternative to admission to the hospital with high-technology facilities. This would be the case even if lower-technology alternatives to hospital admission existed". In other word, there may potentially be a lower-technology alternative to admission to hospital for patients whose admissions are determined as inappropriate.¹²

Appropriate hospital stay can be defined as "inpatient stay requiring continuous and active medical, nursing or paramedical treatment which couldn't be provided through external care, daycare or outpatient care".¹³ Dutch law on quality of care states that appropriate stay is up to standard, effective, efficient and tailored to the patient's actual needs. In other word inappropriate patient stay is neither effective nor efficient.⁹

Although most studies worldwide have looked at appropriateness and quality of hospital care, up to now, no study has been focused in this issue in Iran. In this study an attempt has been made to measure the extent of inappropriate hospital admission and hospital stay in two major teaching hospitals in Tehran [Imam Khomeini: 1230 beds and Dr. Shariaty: 530 beds]. Determining and identification of the leading causes of inappropriate patient stay were another objective followed throughout this study.

METHODOLOGY

Various methods may be employed for measuring inappropriate use of hospital services. Appropriateness Evaluation Protocol (AEP) is the one which was utilized for measuring the objectives of this study. AEP as a tool for determining the medical necessity of hospital admissions and days of care is a set of criterion which was developed by Gertman and Restuccia in 1981.¹⁴ The tool is designed

specifically for acute care and adult patients (Obstetrics and Psychiatry services are not included). The validity and reliability of the AEP has been tested extensively.¹ It includes two categories of criterion, one for evaluating appropriateness of admissions and the other for days of care or hospital stay.

Inappropriate hospital admission and inappropriate patient day of stay were two main dependent variables. Patients' demographic characteristics (age, sex ...), hospital wards, insurance coverage, disease diagnosis and patients length of stay (LOS) were considered as independent variables. Study population included patients admitted to the hospitals which were randomly selected during a three month period (April to July 2006). During the study period, appropriateness of admission of 258 randomly selected patients and their total hospital stays (1732 days) were analyzed and assessed by AEP.

Two nurses from the hospitals staff helped researchers in data collection for which the following steps were taken:

1. At the first day, through a list of newly admitted patients in different wards of the hospitals (ENT, General Surgery, Neurosurgery, Cardiac Surgery, Gastroenterology, Gynaecology, Urology, Rheumatology, Endocrinology, Internal, Orthopaedics), a number of patients were randomly selected. It is worth noting that the wards studied were similar in both hospitals, Imam Khomeini and Dr. Shariaty.
2. Their admissions were evaluated according to AEP criteria.
3. On the next day, the same process was conducted for the newly admitted patients to the wards, and the appropriateness of hospital stay of the first-day patients was evaluated by AEP.

Through this process, admissions and hospital stays of all patients admitted in the hospital were evaluated by AEP. Moreover, the nurses documented the main reason for every single day of care, which was recognized as inappropriate.

RESULTS

Inappropriate Admission (IA): Findings revealed a 22.9% of inappropriate admissions of patients in the hospitals during the study conducted. Patients with inappropriate admission have had lower length of stay (LOS) Table-I. Statistical analysis χ^2 demonstrated a significant association between these two variables ($p < 0.0001$).

There was also a significant association between inpatient wards and IA ($p < 0.0001$). Patients hospitalized in neurosurgery and cardiovascular wards were recognized with no inappropriate admission, while their counterparts in urology and ENT wards revealed the highest level of inappropriate admission; 69.2% and 53.3% respectively. No significant association was found between sex, age, disease diagnosis and hospital on one hand and inappropriate admission on the other (Table-II). It is also worth noting that despite the fact that there was a higher rate of inappropriate admission for insured patients, statistical analysis demonstrated no significant relation between the variables.

Inappropriate Patient Day (IPD): According to findings of the study, out of 1732 days of hospital stay (8.6%) was known inappropriate stay in the hospitals. Using T test for the purpose of finding possible relations between independent variables of the study and IPD indicated that:

There is a significant difference between the hospitals in terms of IPD, 2.27 and 1.64 day for Imam Khomeini and Shariaty hospitals respectively (Table-III). Statistically significant difference was also observed between neurosurgery and general surgery wards with the highest IPD (2.87 days) and (1.53 day) respec-

Table-I: Reasons for inappropriate patient day

Insurance and discharge problems	33.5%
Absence of physicians	17.4%
Waiting period	16.8%
Delay in surgery	11.4%
Delay in investigation results	6.8%
Conservative attitude of physicians	6.8%
Others	7.3%

tively. It is interesting to note that the highest IPD belongs to patients with appropriate admission ($P = -0.044$) (Table-III).

Table-IV shows another significant association between LOS and IPD. The more patient length of stay was associated with more IPD ($P=0.035$). The least mean of IPD (1.69 days) was for patients with lowest LOS (1-4 days) and the most IPD (3 days) was for patients with highest LOS (17 – 20 days). The findings further revealed that IPDs were concentrated on the last days of patient hospital stay and Friday (Iranian weekend) as well.

DISCUSSION

Inappropriate admission (IA): Inappropriate hospital admission in various studies range between 4% to 44.8%.^{15,16} The level of inappropriate hospital admission (22.9%) for the hospitals in the present study was much similar to other studies. Tollander J, *et al*¹⁷ documented 23% of admissions as medically inappropriate on the basis of AEP. Pileggi C, *et al* indicated 28% of admissions as inappropriate in an Italian hospital.¹⁸ There was only 15.3 % inappropriate admission in study focused on an internal medicine department of a “secondary hospital”.¹⁷⁻¹⁹

According to the findings of the present study only 22.9% of admissions were recognized as inappropriate .The main reasons for this seem to be as followings:

Table-II: Comparing admission status and study variable (which had no statically association)

Variable	Hospital		Patient sex		Patient age		Disease diagnosis		Health insurance	
	Imam Khomeini	Shariaty	female	male	<40	≥40	New case	Old case	Yes	No
Appropriate	80.9	71.7	76.5	77.6	74.1	80.7	74.2	83.8	76	80
Inappropriate	19.1	28.3	23.5	22.4	25.9	19.3	25.8	16.3	24	20

Table-III: Comparing means of inappropriate patient day (IPD) and study variable

Variable	Hospital		Patient sex		Patient age		Disease diagnosis		Health insurance			
	Imam Khomeini	Shariaty	Appropriate	Inappropriate	female	male	<40	≥40	New case	Old case	Yes	No
Means of IPD	2.27	1.64	2.18	1.55	1.93	2.06	2.66	1.93	2.1	1.8	2	2.01
p-value	* 0.025		*-0.044		0.641		0.641		0.254		0.951	

* Statistically significant association

- * Lack of sufficient services in lower levels of health system and accumulation of resources in higher level including hospitals.
- * Patient self-referral behavior – although referral system is partly used in Iran health system but most people ignore it and they themselves decide to go the healthcare facility of their choice.
- * Avoidance of using Out Patients diagnostic facilities.
- * Perhaps unsatisfactory fulfillment of patients needs in hospital’s emergency department.

Inappropriate patient day (IPD): Inappropriate patient day ranged between 6.9% to 48%.^{20,21} The overall percentage of inappropriate patient days (8.6 %) in TUMS hospitals was consistent with the other study results which are mostly conducted in European countries & USA hospitals; Santos-Eggimann et al found that the level of inappropriate hospital use in four Swiss hospitals ranged between 8.3 and 15.3% for days; Ghopard, et al showed that 28% of hospital days was inappropriate.^{22,23} Our findings indicated that the reasons for the inappropriate hospital stays were not mainly clinical but managerial /administrative. Insurance coverage and inability to pay for hospital services were determined as main causes for delay in patient discharge procedure. Lack of / difficult access to service providers/physicians, paperwork and barriers for medical consultations and postponed surgeries were recognized as the other reasons for inappropriate hospital stays in TUMS hospitals. The same reasons have been stated for IPDs in a study by Santos-Eggimann et al.²²

According to Kossovsky, et al modification of patient discharge process resulted in reduction in inappropriate hospital stay (from 28% to 25%).¹⁰ The effect of patient discharge process on IPDs has been identified by findings of the present study. Out of the two hospitals, IPDs in Shariaty hospital was significantly lower than that of Imam Khomeini hospital .These hospitals use different patient discharge process which is decentralized in Shariaty hospital and centralized in Imam Khomeini hospital.

Based on various studies including this one, the major share of IPDs is the result of inefficient hospital administration which could be improved and reorganized using modern methods of restructuring the health services.

CONCLUSIONS

Inappropriate admission to hospital inpatient services, together with inappropriate hospital stay results to inappropriate hospital resources utilization. Improving emergency services, streamlining lower level managerial health services, discharge process, insurance coverage and other health infrastructure using modern technology ensuring effective monitoring, and

Table-IV: Comparing LOS and mean of IPDs

Length of stay	No.	Mean ± SD	95%CI	
			Low	High
1 – 4day	13	1.69 ±1.1	1.02	2.36
5-8day	38	1.86 ±1.04	1.52	2.21
9-12day	16	2.31±1.53	1.49	3.13
13-16 day	6	2.66±1.36	1.23	4.1
17-20 day	1	3		

df=4 p-value = 0.035

empowerment of management can reduce inappropriate admissions and hospitalization. This will also reduce the hospital expenditures.

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