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Policy-Making based on the AEP Protocol (Appropriate Assessment of Hospitalization) in Order to Rationalize Health Insurance Costs in Meshginshahr Hospital

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Methods: This study is a descriptive and applied study. A total of 660 hospitalized patients were evaluated in internal and surgical departments of the hospital. To determine the admissions and inappropriate hospitalization days the Appropriateness Evaluation Protocol (AEP: Appropriateness) have been applied.

Keywords: *appropriate assessment protocol (APE), inappropriate admission, unnecessary admission days.*

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Methods: This study is a descriptive and applied study. A total of 660 hospitalized patients were evaluated in internal and surgical departments of the hospital. To determine the admissions and inappropriate hospitalization days the Appropriateness Evaluation Protocol (AEP: Appropriateness) have been applied. Descriptive statistics (percentage, mean, and dispersion criteria) were used to describe the data and determine the admission and inappropriate hospitalization days.

Results: Out of 660 hospital admissions, 177 cases (26.8%) were considered as inappropriate admissions. The highest unconfirmed admission rate was in the internal sector with 36% and the lowest uncontrolled admission rate in the surgical ward was 12%. Out of 2158 days of admission, 600 days (27.8%) were unnecessary. Unnecessary hospital stay in the internal ward was the highest with 35.4% and in the surgical ward with 11.7% was the lowest. For every bed fee of 660 unnecessary admission days, an amount of 841,595,400 Rials wasted for the health insurance organization in three sections of this 115 bet hospital.

Findings: A significant percentage of hospital admissions and hospitalization days are unnecessary. The high costs of this phenomenon necessitate the attention of healthcare managers and health care providers to interact with hospitals and adopt an operational strategy for the proper use of hospital facilities and the management of hospital costs.

Keywords: appropriate assessment protocol (APE), inappropriate admission, unnecessary admission days.

I. Introduction

In the context of policy-making in the health system, an assessment of the effectiveness of health services provider units is one of the main goals and activities. Part of this assessment focuses on the economic dimensions, the improvement of methods for using financial resources, and the prevention of the creation and spending of unrealistic costs and the avoidance of unnecessary financial and human depreciation. In addition to these factors, the effectiveness of diagnostic and therapeutic and health care interventions to promote community health has made health services, especially in hospital and hospital settings, a complex process. Of course, the marginal influences include restrictions on financial resources and increased chronic diseases, and the reduction of age at the onset of certain diseases, along with the development of new technologies in the field of diagnosis and treatment, and the increasing use of these tools, increases the cost of health care expenditures incidence in the hospital and adds to the complexity of the process.

Restriction of resources in the healthcare system is the most important reason for health care providers in most countries of the world to bring about the appropriate use of facilities in all areas of health care provision. At the same time, hospitals, with the provision of various diagnostic services and nursing care, have high costs for the health system of the country and insurance companies.

Hospital services, as the most expensive part of the modern healthcare system, affect the health system of the country and, consequently, the main insurer organizations that are the main payer of health care costs. Statistics from the Health Insurance Company which is one of the country's largest and most comprehensive insurance companies, show that more than 60 percent of the costs are for hospitalization services. On the other hand, hospitals have a great potential for attracting financial and human resources, and therefore, the increase or decrease of health care costs and subsequently the costs of basic insurance companies in the country play an important role.

Therefore, having the correct and documented information on objective evidence and then taking necessary interventions to improve the quality of hospital services, and avoiding unnecessary hospitalization days, can be of cost management and cost control for the health system of the country and

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insurance organizations. In this way, improving the efficiency of hospital services by reducing costs and proper use of the potential capacity of hospitals to provide appropriate services to people leads to improve the efficiency of the health system of the country.

The fundamental question is how much to provide hospital services to…

1. Patients who are in need of hospitalization without undue delay receive the necessary services.
2. To avoid unnecessary use of physical and hospital facilities and capacities.
3. Improved hospital productivity and ensure the lowest cost (while maintaining the quality) for the health system and insurance and user organizations.

Accepting and accommodating a patient in a hospital is a condition in which the patient needs to carry out diagnostic and ongoing medical and surgical treatment and provide continuous nursing care in such a way that doing this in any place other than the hospital (such as limited surgical centers or clinics or outpatient clinics or homes or care centers) would not be possible.

On the other hand, inappropriate use of hospital services is a condition in which hospital resources are used for patients who do not benefit from it and do not recover, or treatment with the same benefits and quality could be done out of the hospital. This inappropriate use happened in two forms of unnecessary admission and in the form of unnecessary hospitalization days.

Unnecessary admissions and unnecessary hospitalization days have several complications and consequences for patients and are based on the health system of the country and the insurance organizations, including:

1. Increases patient costs and basic insurance organizations.
2. Reduces available resources for critical situations.
3. Loss of resources and depreciation of hospital equipment.
4. Loss of energy and depreciation of human resources, especially the paramedical staff of the hospital.
5. Exposes patients to complicated consequences of hospital stay such as hospital infections or blood clots in the veins.

And of course, this is apart from the psychological, social and economic consequences of being away from the patient's home and community and profession.

A survey conducted in the information networks and articles in the scientific literature shows that in the various countries of the world proper use of the hospital bed is one of the priorities of the economic evaluation of the supply services in the hospital sector. In this regard, numerous studies have been conducted on the admission resources and patient hospitalization. In these studies, unnecessary admissions or unnecessary hospitalization days with the AEP tool have been evaluated.

Table 1: Show that the number of unnecessary hospitalization days in some studies in different countries ranged from 11% to 75%.

Percentage of unnecessary hospitalization days	Year	Country	Researchers	Row
11	2001	North korea	Kim CS, Hart AL, Paretti RF, Kuhn L, Dowling AE,Benkeser JL, et al	1
13/5	2005	England	Carey M R, Sheth H, Braithwaite R S	2
20	2003	India	Panis LJ, Gooskens M, Verheggen FWS	3
22	2001	Turkey	Celik Y, Celik SS, Bulut HD, Khan M, Kisa A	4
14	2011	South korea	Hwang J, Kim J, Jang W, Park JW	5
24/6	2011	Italy	Fontaine P, Jacquesb J, Gillain D, Sermeusc W,KolhaPh, Gillet P	6
29	2011	Hong kong	Leung LP, Cheng YW, Fan KL	7
Surgical section28 : Internal section33	2002	Germany	Sangha O, Schneeweiss S, Wildner M, Cook EF, Brennan TA, Witte J, et al	8
18/1	2003	Italy	Carnessale G, Staniscia T, Matarrese D, Seccia G, Schioppa F, Di Giovanni P, et al	9
45/2	2007	Mexico	Tamames S, Perez Rubio A, CastrodezaSanz J, Canton Alvarez MB, Luquero FJ, et al	10
75/7	2004	Italy	Pileggi C, Bianco A, Di Stasio SM, Angelillo IF	11
37	2002	Italy	Castaldi S, Ferrari MR, Sabatino G, Trisolini R, Auxilia F	12
35/5	2001	Spain	Attena F, Agozzino E, Troisi MR, Granito C, Del Prete U	13

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Table 2: Data, in Iran, similar non-specific hospitalization days were between 2% and 39.4%.

Number of admitted admission days	Year	Researchers	Row
% 5/9 – 8/9	2007	Hatam et al. (Shiraz Hospitals Study)	1
% 8/6	2008	Pourreza et al. (Tehran Hospital study)	2
%/6	2007	BakhtariAghdam et al. (Imam Tabriz Hospital Study)	3
% 6/2	2009	Fakkari et al (AaliNasab Hospital of Tabriz)	4
% 2	2011	Maskani et al. (Sabzevar Hospital Study)	5
% 39/4	2015	Tavakoli et al. (Sina Hospital in Tehran)	6
%9	2012	Khosravi (Afzalipour Kerman Hospital)	7
% 6	2012	Mohebi et al. (Urmia hospitals)	8

Table 3: Shows that according to some studies conducted in other countries, non-critical acceptances were in the range of 4.3 to 55 percent.

Unnecessary Admission Percentage	Year	Country	Researchers	Row
% 4/8	2002	Turkey	Demir C , Teke K, Fedi T, Kenav L, Bilgic H, Sen D	1
% 55 Pediatrics	2004	Italy	Pileggi C, Bianco A, Di Stasio SM, Angelillo IF	2
% 31/5	2002	Italy	Castaldi S, Ferrari MR, Sabatino G, Trisolini R, Auxilia F	3
Pediatrics % 55	2002	Sweden	Bianco A, Trani F, Angelillo IF	4
23	2004	Danmark	Thollander J, Gertow O, Hansen S, Carlsson B, Hallert C	5

Table 4: Shows that in similar studies conducted in Iran, the range of unconfirmed admissions was between 6% and 31.5%.

Unnecessary AdmissionPercentage	Year	Researchers	Row
14/5 – 31/5	2007	Hatam et al. (Shiraz Hospitals Study)	1
22/8%	2008	Pourreza et al. (Tehran Hospitals Study)	2
6%	2007	BakhtariAghdam et al.(Imam Tabriz Hospital study)	3
7%	2009	Fakkari et al. (AaliNasab Hospital ,Tabriz)	4
11/4 – 29/1%	2011	Maskani et al. (Sabzevar Hospital Study)	5
16/2%	2015	Tavakoli et al. (Sina Hospital, Tehran)	6
6/7%	2012	Khosravi (Afzalipour Hospital Kerman)	7

In any case, the extensive effects of inappropriate use of physical facilities, as well as manpower employed in different parts of the hospital, are of paramount importance, which puts the attention of healthcare owners and caregivers to the awareness of the inappropriate use of the bed Hospitalized by itself. The present study is aimed at determining, firstly, the number of admissions and inappropriate hospitalization days in a 115-bed university hospital and, secondly, determining the amount of costs incurred by the health system and the health insurance organization that occurs with this phenomenon.

II. Method

This study is an analytical and applied descriptive study. The insured persons covered by the Health Insurance Organization from all of the funds accepted at Valiasr Hospital in Meshginshahr in July 2012 were the statistical population of this study. This number includes a total of 1364 insured.

The sample size was 246 patients in this study, which was calculated according to the following formula.

$$N = \frac{Z^2 \neq _{aa2} * p * (1-p)}{d^2}$$

According to studies conducted in other countries, as well as some limited studies in Iran, which reported an unacceptable acceptance rate of 10 to 40 percent, and with an average of 20 percent, in this study, to determine the sample size P of 20 percent Was considered. Considering d = 0.05 and a = 0.05 sample size was considered 246 people. By selecting 3 independent internal, surgical and pediatric wards, to increase the accuracy of the study, the number of samples increased to 660 items. Sampling was done randomly and serially from the beginning of August 2012 simultaneously in all three parts of the internal and surgical and pediatric hospitals, and the sampled work continued to complete 220 items in each of the three sections.

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For collecting the statistical data required by the field method, the checklist tool called the AEP protocol was used.

Appropriateness Evaluation Protocol this protocol was published in the United States in 1981 by estuccia and Gertman and is a criterion valid for all sections of the hospital excluding maternity, obstetrics, and maternal toxicity. The criteria of this protocol are designed to keep the researcher away from personal observance (1 and 2). This check list was approved in 1982 by the (Professional Standards Review Organization). Validity and validity has been confirmed frequently in studies conducted in European and American countries (21, 22, 23, 24).

This protocol was reviewed by a researcher in Tehran University of Medical Sciences in 1394 in a detailed study and adapted to the health and nursing care system of the country (3). In this study, to assess the admission and admission days The patient has been used in the surgical and internal and pediatric wards of this edition.

This checklist has two separate tables. The first table is designed to determine appropriate and inappropriate admissions and includes 24 criteria. According to these criteria, if the patient accepts one or more than one of the 24 cases in Table 1, his admission is deemed appropriate, otherwise the admission of the patient will be inappropriate. The second table is designed to determine the appropriate or inappropriate nature of hospitalization days and includes 30 criteria. If the patient has one or more of the 30 criteria in this table, then the day of admission is deemed appropriate, otherwise the admission of that day will be considered inappropriate.

a) Unnecessary Admission

Table A of the AEP protocol is an admission that the patient could receive the medical or nursing services without admission to hospital or outpatient. Therefore, this admission is deemed to be inappropriate.

b) Unnecessary Patient Stays

According to table 2 of the AEP protocol, the day of admission to hospital is a patient who has no medical or diagnostic or nursing care that requires hospitalization, and the patient could have been discharged or received these services and services outpatient. This day is considered to be inappropriate.

The data and information necessary to conduct the study with direct referral of the patients to the clinic of hospitalized patients and direct questions from the patient, as well as the reference to the contents of his case, are extracted and recorded in the data collection checklist. In cases where the information recorded in the case or the patient's response was not transparent and convincing to record the information in the AEP tables, the physician received a question and answer.

The method of work was that from the beginning of August, 2017, each newly admitted patient in the first part was evaluated using table AEP protocol, and if necessary, he / she was admitted to the hospital on the checklist. During the following days, the patients were evaluated on the basis of the AEP Table 2 and the results were recorded on the checklist by referring to the bedside of the patients whose admission was evaluated. Similarly, in each working day, the patient was examined for new admissions and old patients, and each patient was examined until he was admitted to the hospital, and when he left the study, he was discharged or died or transferred to another center. This work continued until completion of the sample of 220 cases in each of the three sections of the hospital.

Using the Excel software, data collected from Master shit was transferred to the computer. Descriptive statistics (percentage, mean and dispersion criteria and central) were used to describe the data and determine the percentage of admission and inappropriate hospitalization days.

III. Findings of the Study

55% of the insured (363 people) were male and 45% were insured (297) women. 132 (20%) patients were electronically and 528 (80%) were admitted in an emergency. The mean hospitalization days for elective patients was 3.4 days and for emergency patients was 3.14 days.

The insured, whose case file included a global hearing, had an average day of hospitalization of 2.48 days, which was 3.31 days for ordinary insured persons. The average days of hospitalization in the surgery department were 2.81 days, in the internal part 3.75 days and in the pediatric department was 3.27 days. The average of hospitalization days in hospitalized patients was 3.19 days in three parts.

Table 5: Descriptive table of unnecessary admission in three parts of the hospital

Section name	Total number of admissions	Necessary admission		Unnecessary admission	
		Number	Percentage	Number	Percentage
Internal	220	141	64	79	36
Surgery	220	194	88	26	12
pediatrics	220	148	67	72	33
total	660	483	73.2	177	26.8

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Table 6: Descriptive-analytic table of unnecessary hospitalization days in three parts of the hospital

Section name	Total number of admissions	Necessary Days of hospitalization		Unnecessary Days of hospitalization	
		Number	Percentage	Number	Percentage
Internal	820	530	6/64	290	4/35
Surgery	619	547	3/88	72	7/11
pediatrics	719	481	9/66	238	1/33
total	2158	1558	72.2	600	27.8

Among the 660 evaluated admissions, 177 cases (36%) were unnecessary. The highest unconfirmed admission rate was in the domestic sector with 36% and the lowest uncontrolled admission rate in the surgical ward was 12%.

Among the 2158 admission days, 600 days (27.8%) were unnecessary. Uninhabited days in the internal sector were the highest with 35.4% and the lowest in the surgical sector with 11.7%. Considering that, this hospital is unique in the region and there is no other hospital (public or private), it can be seen that the phenomenon of admission and unnecessary hospitalization days is relatively common in most hospitals in the country. Especially in cities and areas where there are enough hospital beds and doctors and there is competition to attract more patients.

In the economic evaluation, the findings can be estimated from the amount of health insurance funds spent due to unnecessary admissions and inpatient residences in the hospital.

Considering the first grade of hospital accreditation and the cost of bed day and 6% of nursing costs for a flat fee for admission at 660 admissions, the amount is equal to 841,595,400 Rials. The financial loss for the health insurance organization in the three sections mentioned in this hospital is 115 non-hospital beds. Educational has been created. If this number is generalized, it will be determined by the number of admissions throughout the year, the inappropriate use of hospital resources, and the illogical use of health care resources.

IV. Discussion

Unnecessary acceptance rate in Khosravi 2012 study was 6.7% (31). In Tavakoli study (2015), was 16.2% (25). In Fakari study (2009), was 7% (19). In Pourers' (2008) study was 22.9% (17). In the study of West Bengal (2007), 6% (18) did not match the results of this study.

In the present study, the rate of unnecessary admission in all of the three sections was 26.8%, which was reported by Hatam et al. In Shiraz hospitals 2007, which reported an unnecessary admission rate ranging from 1.19 to 31.1%, as well as with the study of Maskani (2011) this amount is consistent with the reported 11.4% and 29.1% (20). (16).

The unnecessary acceptance rate for the Thollander study 2004 is 23% (28). This rate was reported in the 2002 by Demir study 8.4%, which is not consistent with the results of the present study. (5). in the Castaldi study (2002), unnecessary admission was 31.5%, which is consistent with the results of the present study (26). In the study, the unnecessary admission rate in the pediatric ward was 33%. This result is not consistent with the results of the Bianco (2004) and the Pileggi C study (2004), which reported an unnecessary admission rate of 55% in the pediatric ward (15.27).

The amount of unnecessary admission days in the present study was comprised of three sections: internal, surgical, and pediatric, 27.8% of the total hospitalization days. This study reported 39.4% in the Tukwil study in (2015).

In the study by Hatam et al. (2007), This rate was reported in the range of 5.9% to 8.9% (16). In Pourreza et al. (2008) (8.6%) mentioned this issue (17). In addition, in the study by Mohebbi et al. (2012), This figure is 6% (32). In addition, in the Bakhtari's study, this rate was 6.8% (18), and in the study of Maskani, this was 11.4% (20) and in the Factor study (6.2%) (19), which is not consistent with the results of the present study.

Results from studies conducted in other countries have reported unnecessary hospitalization days in the range of 11.7-75.7%. unnecessary admission days were 37 percent in the 2002 Castaldi study and 31.5 percent in the Attena F study of (2001), which is not consistent with the results of the present study (30, 26). unnecessary admission days were 45.2% in the Tamames S study (2007) and 75.7% in the Pileggi C study (2004), which shows an increase in the number of unnecessary admission days in the study (14, 15). In other studies, the percentage of unnecessary admission has been in the range of 11% to 33% (row 1 to 9 of Table 1)

There is a significant difference in the rate of unnecessary admission in these studies, but this difference may be attributed to the difference in admission procedures in different educational centers and the occupancy rates of different beds in the centers. Of course, payment methods to healthcare providers, especially physicians, are even more important. Because there is no financial incentive for more hospitalization in the DRG method of paying doctors or

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interns working in the hospital. However, in Fee for Service and pay-per-day admission methods, there are strong financial incentives for physicians to receive more admissions and more hospitalized days.

In various studies abroad, there are no mechanisms for paying doctors working in the hospital. In Iran, for doctors specializing in hospitalization, a combination of wages (for faculty and full-time care) and in some cases for each day of admission and visitation or relative value of the codes for services included in patients' files. These issues, coupled with a significant increase in tariffs in the book of relative values and the two-fold factor of the value of the visit of some professional physicians, can create positive financial incentives for admissions or uncompromising days of admission. In this study, it was found that the average days of hospitalization in patients with global cases (2.84 days) were less than the average days of admission to patients with normal cases (3.31 days). This suggests that in the absence of financial incentives for a visit or more income resulting from long-term sick leave at a hospital for a physician, the average patient's hospital days should also be reduced.

V. Conclusion

Many countries, including our country, are faced with growing weaknesses in proper use of hospital resources. These weaknesses, especially in admissions and days of unnecessary admission, are a factor in imposing huge costs on the health system and insurer organizations. In the meantime, recognizing and differentiating between admissions and necessary days of admission unnecessary admission days and attempts to reduce this phenomenon is one of the most effective ways of managing hospital resources and facilities for patients.

Desirable conditions, the use of existing beds with maximum efficacy means the patient's admission only if it is indicative and avoiding or minimizing the patient's admission periods. For the health insurance organization, determining the extent of unnecessary admissions (non-disclosure) as well as unnecessary hospitalization days in hospitals can be an important step towards interacting with the authorities of the country's health system in order to properly and efficiently use hospital facilities and manage and control costs in hospitalization section.

Currently, the Health Insurance Organization and other basic insurance organizations do not have credible and reliable information about the number of admissions and unnecessary residence days of insured persons in hospitals. The lack of familiarity with and use of scientific and valid instruments such as AEP to differentiate and determine admissions and days of hospitalization, and on the other hand, the lack of legal criteria for not accepting and paying for unnecessary admissions and days of residence has led to virtually no effective influence over the performance of hospitals and part of hospitalization in insurance companies.

The results of this study indicate that a significant percentage of admissions and admission days are unnecessary. The high costs of this phenomenon require that the basic insurer interacting with the strategic goal of cost management and control, and preventing the loss of funds. The health system of the country's health system interacts with the university's health authorities and hospital managers and uses the AEP protocol as a tool. Supervision and feedback on its results will provide a framework for monitoring and managing the logical use of hospital beds.

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