



## **Comparison of Hoteling Cost of Global Surgery with Real Cost in Isfahan Public Hospitals, 2012**

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### **ARTICLE INFO**

#### **Article History:**

Received: 1 Oct 2016

Revised: 24 Nov 2016

Accepted: 23 Feb 2017

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### **ABSTRACT**

**Background:** Paying for the global surgery is one of the prospective payment methods in which service providers receive their service costs according to a preset table. In this method, payment is based on patients' treatment not in terms of any remedial action. Therefore, it reduces the motivation of rendering unreasonable service. However, its weak point is making simple diseases complex as well as reducing consumption of resources for patients and etc. Since surgeries are considered as costly items in Iran's insurance system, the present study targeted at investigating the hoteling cost of global surgery in Isfahan public hospitals.

**Methods:** This descriptive and Applied research has investigated the difference between real hoteling cost of 60 global surgeries and the amount of paid hoteling in global plan in Isfahan public hospitals in 2012. The real hoteling cost of the global surgery (real rate of patients' hospitalization) was collected through Hospital Information System (HIS). The required information about the global costs was also obtained from the annual Insurance Council directive on how to calculate the global surgery. Excell software was then used for data analysis.

**Results:** The average of real hospitalization hoteling and paid hoteling costs by the health insurance to the hospital based on the global plan were respectively 1.77 and 2.81 in which the real difference between hospitalization and the calculated amount in global plan is 1.04 day.

**Conclusion:** There was a difference between global cost paid by insurance companies to the hospital and the real cost of surgery in all investigated surgeries so that from 60 cases of global surgery in 53 real hoteling, patient hospitalization was less than the amount paid in global plan of hospitals. Real hoteling was more in just two cases.

**Keywords:** Global Surgery, Hospital, Hoteling

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### **Citation**

**This paper should be cited as:** Fattahpour AH, Ebrahimi Dourcheh R, Rahimi M, Rafiee N. **Comparison of Hoteling Cost of Global Surgery with Real Cost in Isfahan Public Hospitals, 2012.** Evidence Based Health Policy, Management & Economics. 2017; 1 (1): 46-52.

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## Introduction

Health insurance is faced with several ethical challenges including moral hazard of providers and consumers as well as moral hazard due to hidden information (insurance is not able to measure the status and severity of illness). This can increase the negative effects like consumption of unnecessary services, incorrect pattern of consumption through using sources, and finally increase of costs (1). It has been calculated that the annual cost of hospitalized patients' treatment is higher than costs of outpatients' treatment. Every year large sums of capital of insurance agencies, waste due to the unnecessary administration of services by physicians and medical centers, long-term hospitalization of patients in hospitals, spending a lot of resources to examine documents and hospital bills (2). In the meantime, health and medical services of surgeries are considered as the most expensive medical services provided in hospitals (3). The global payment will lead to higher productivity and in case of correct implementation, it can be considered as an effective strategy in controlling the inflation costs of health (4,5). One of the most important strategies to inhibit health costs of different insurance systems is using the "system of payment to suppliers and providers of health care services" (6). Supreme Council of Insurance in the Ministry of Health, Treatment and Medical Education in the forty-third session dated 1999/2/28 adopted legislation to impose tariffs on the global calculation and declared 60 cases of common surgical procedures. Article one of the plan refers to calculation of total tariffs (the global) of common surgical procedures based on 65,000 patient records (7). Cost of these actions' bills and their tariff is determined as a total figure. So, insurance organizations pay their share of tariff to hospitals for each global operation regardless of hospital costs (8). There are many countries trying to reform their payment systems. For example, Medicare insurance system is considered to prevent payment more or less than the preset price. Three global packages were defined in Medicare insurance system (in terms of number of days after surgery); zero staying days after operation (such as endoscopy and minor

surgeries), hospitalization for ten days after surgery, and ninety-day accommodation after surgery (9). Internal and external researchers introduced the unnecessary reduction of hospitalization days by healthcare organizations to have higher institutional profits as one of the problems of prospective payment system (10). In order to carry this strategy in a successful way, more accurate investigation is needed to stop hospitals to think more about their profits by reduction of their quality and quantity. Previously, several studies have discussed about heavier costs of global surgeries on insurance organizations or hospitals that will be mentioned in following. One of such studies is the one carried out by Eshpala et al. (10). They investigated hospitals of Bastak city in Bandar Abbas and concluded that in 86% of cases, cost of global operation had profit for hospital. In this regard and to investigate this issue meticulously, the present study was carried out by the purpose of investigating the cost of global operation hoteling conducted in Isfahan public hospitals.

## Materials and Methods

The current descriptive retrospective study was carried out in 2012 based on the applied goal of assessing the cost of real hoteling of global surgery with the amount of paid hoteling in global plan which is based on the evaluation of hospital. It is required to mention that surgery information was investigated in 2011. In these hospitals 60 operations that confirmed by the Supreme Council of Insurance in the Ministry of Health and Medical Education were investigated. Data needed to determine the real hoteling cost of global surgery (real rate of hospitalization of patients) were collected through hospital information system (HIS) and needed information about the global costs of the annual directives of Insurance Council on how to calculate the global surgery were obtained. Excell software was used to analyze data and information of 5623 cases of conducted global operations was collected from public centers of Isfahan province in a period of 3 months (from July to September 2011). Since the most surgeries



were carried out in this period, the information on this period has been investigated.

Further, in the current study all ethical issues were observed based on the Helsinki Declaration.

**Results**

Research findings showed that 1328 patients (23.6%) were in the second grade hospitals and 4295 patients (76.4%) were in the first grade centers. All Therapeutic Educational Centers in the study period were from grades one and two. The real amount of hospitalization hoteling in all centers that calculate global operations was 1.77 days on average during the study period. But payment of the medical insurance to the hospital was based on the global average of 2.81 days. Therefore, the difference between the real amount of patients' hospitalization and the amount of calculation in global plan was in 1.04 days.

Evaluating the frequency of global surgery during the study period showed that 60% of frequency was related to three common operations of cataract surgery, cesarean, and natural childbirth. However, 40 % of frequencies was related to other 57 cases of global operations (Cataract and implantation in 1209 cases (21%), cesarean in 1288 cases (23%), natural childbirth by physicians about 899 cases (16%) (Table 1).

Microstructural Investigation cost of the global surgery in this study showed that major global costs were related to surgical topics 26.5%, hoteling 21.7%, anesthesia 9.6%, medications 8.1%, consumed equipment 15.8%, and surgery room 13.2%. These results represent that hoteling costs allocate the highest amount of costs after surgery among global surgery cost topics and have a highlighted role in total global costs (Table 2).

**Table 1.** Global hospitalization rate of 10 surgeries in Isfahan public hospitals from July to September 2012

| Name of global operation  | Frequency | Number of Actual days of hospitalization | Number of Actual days of global | Average actual residence | Average global residence | Residence Difference |
|---|-----------|--|---------------------------------|--------------------------|--------------------------|----------------------|
| Tonsillectomy and adenoidectomy at any age  | 125       | 144                                      | 200                             | 1.15                     | 1.6                      | 0.45                 |
| Appendicitis, peritonitis, or both, with or without drainage  | 344       | 721                                      | 1100.8                          | 2.10                     | 3.2                      | 1.10                 |
| Emorrhoids, every method, simple or complex, with or without fissurectomy   | 141       | 215                                      | 366.6                           | 1.52                     | 2.6                      | 1.08                 |
| Unilateral inguinal hernia with or without excision of any kind, except spermatoceles hydrocele or inguinal hernia strangulated | 245       | 396                                      | 588                             | 1.62                     | 2.4                      | 0.78                 |
| Giving Birth by physicians in any form  | 899       | 1106                                     | 1823.6                          | 1.23                     | 1.4                      | 0.17                 |
| Diagnostic or therapeutic dilatation and curettage (non-obstetric)  | 144       | 178                                      | 201.6                           | 1.24                     | 1.4                      | 0.16                 |
| Total hysterectomy, with or without removal of the ovaries  | 112       | 372                                      | 523.4                           | 3.32                     | 4.7                      | 1.38                 |
| Cesarean in any method  | 1288      | 2006                                     | 5226.4                          | 1.56                     | 2.8                      | 1.24                 |
| Legal abortion a surgical procedure with or without dilatation  | 189       | 256                                      | 283.5                           | 1.35                     | 1.5                      | 0.15                 |
| Removing the lens, inside and outside of lens' capsule + lens implementation  | 1209      | 1415                                     | 2659.8                          | 1.17                     | 2.2                      | 1.03                 |
| Others  | 5623      | 9934                                     | 15808                           | 1.77                     | 2.81                     | 1.04                 |



**Table 2.** Costs' heading of global operations in Isfahan public hospitals

| Service description            | Cost (\$) | Cost (%) |
|--------------------------------|-----------|----------|
| Hoteling                       | 142622    | 21.76    |
| Visit                          | 9244      | 1.41     |
| Consultation                   | 2872      | 0.44     |
| Surgery premium                | 173367    | 26.45    |
| Assistant surgeon              | 7262      | 1.11     |
| Surgery room                   | 86684     | 13.22    |
| Anesthesia                     | 63155     | 9.63     |
| Medication                     | 53644     | 8.18     |
| Experiment                     | 4974      | 0.76     |
| Pathology                      | 952       | 0.15     |
| Radiology                      | 1422      | 0.22     |
| Sonography                     | 269       | 0.04     |
| Radiography                    | 862       | 0.13     |
| Consumed equipment             | 103907    | 15.85    |
| Other hospitalization services | 4244      | 0.65     |
| Total                          | 655480    | 100      |

**Discussion**

Findings showed that there is a difference between costs paid by insurance companies to hospitals and the actual cost of the operation in all operations under investigation. This was in such a way that from the total of 60 cases of global surgeries, 53 cases of patients' actual hoteling costs were less than the paid cost in global plan of hospitals and just in two cases the actual hoteling costs were more. Further, 50 cases of global surgeries had no sample in the study period. One of the main reasons for the changes in the pattern of diseases is hospitalization. At the beginning of the project 10 years ago, all surgical procedures for hospitalized patients such as anesthesia consultation and clinical procedures were performed before surgery and during the hospitalization, which required more time for patients' hospitalization and their expenses were calculated at global plan. This pattern has changed now and in most of the cases is associated with setting up the anesthesiology clinics in which patients are possibility prepared before surgery through internal, anesthetists, and cardiologists' consultations followed by clinical tests carried as outpatient. Another reason for the difference between patients' actual residence and global hoteling costs is the change in surgical techniques and use of new equipment in

operations. Its advantage is reduction of the recovery time, relative improvement, and earlier discharge of patients. However, factors such as lack of attention to the rate of inflation in the global cost calculation and lack of attention to diseases that were not the main reason for hospitalization but existed at the time of hospitalization would increase the time of hospitalization and cause this mismatch. These cases must be noted at the time of payment of fees. Various studies indicated that there is difference between paid costs from insurance organization and hospital costs in case of global operation performed in hospitals. Marjani (8) conducted a comparative study regarding the difference between general operation costs (global) in hospitals of Social Security Organization. It was concluded that hospitalization costs' management is neglected in most civilian hospitals so that the range of variation in cost components of hospitals are very varied despite the similarity, procedures, and tariffs. Arab et al. (2), in their study in cancer institute found a significant difference between global cost paid by insurance companies to hospitals and the actual cost of operation among all investigated operations. They also reported that the mentioned operation cost is more than the allocated credit from insurance organizations



under name of global. This result did not match with results of the current study. Haj Ghasemali and Mahmoudi (2) in their study concluded that in all 60 investigated cases of operations except for the excision of incomplete nail bed, the cost of global operations was higher than their equivalents in private hospitals. Also, the cost of the surgery was less in the private sector for insurance organizations which needs attention of authorities in the area of pricing. Cheterz et al.(6), in a study compared finance bills' costs of global operations and the approved fees in hospitals of Tehran University of Medical Sciences. They concluded that from the total of 90 operations included in global fees, 65% were conducted in the studied hospitals. Comparing the average cost of hospital fees with those of global tariff showed that with the exception of 7 operations, (61 items) costs of operation in other cases were 3-3.12 % more than the global tariff. The highest amount of difference was related to the repair of nasal septal with or without implantation of cartilage (septoplasty). Gholamzadehnikjoo et al. (11), investigated the actual and global costs of kidney transplant and found that the hospital incurred loses. Nozari (12) in his study entitled as "Comparing the performance of the global insurance tariffs and hospital in global surgery of Faghihi the Hospital (1999)," stated that Faghihi hospital of Shiraz in 20 cases of global operations that included about 92.5 % of people who referred to this hospital, had a profit near to 1245\$. In other words, payments insurance by insured patients and free patients in these operations are about 12.44 \$ more than costs of hospital. However, from 6 cases of operations in which 7.5 % of patients are global, hospital loses more than 1358\$, consequently the final profit of hospital is approximately 1094 \$. The results of the study carried out by Omranikho et al. (13), on economic evaluation of the global payment system and its comparison with bank payment system in Bushehr showed that form 1667 hospitalized patients of global operation, costs of the global operation were higher in 570 case while in 1097 cases they were less than the global tariff. The

results achieved through the present study were consistent with the results of two recent studies.

Therefore, organizations like insurance are intended to apply strategies such as type of hospital (Costs of services provided to patients hospitalized in educational hospitals are higher than costs of only-treatment hospitals) and consider issues like inflation rate (12) at the time of making contract with insurance to prevent any damage. Also, in another study conducted on National Health Service (NHS) organization, it was observed that all 60 cases of global operations, with exception of one case, have higher global operation costs than other ones in private sections and the final cost of surgeries in private sectors are less for the insurance organizations (2).

The difference between the costs of global systems and real payments are sometimes because of the following reasons:

No increase in the global costs in relation to the inflation rate in spite of years passed since implementation of Global Plan, higher treatment costs of hospitalization services in treatment-educational hospitals than non-educational centers, conductance of two global operations that eventually only one of them is calculated as a global, physicians' lack of knowledge regarding the fact that global costs are fixed for the insurance companies and increase in the number of hospitalization days, medications, and consumed equipment prescribed for patients would not change it.

The limitations of this study includes the data collection approach; cross-sectional study within a specific time with a specific volume of samples.

### Conclusion

Reformation of hospitals' information systems to record reliable data accurately is essential according to the differences between real costs incurred in hospitals and approved tariffs of the global surgery. Exact determination of actual global costs (by using exact accounting methods), in line with efficient use of organizations' resources is essential by taking into account factors such as the Universal Periodic Review and the type of hospital (training or just medical),



comorbidities, age, changes in surgical techniques, as well as characteristics and conditions governing this type of surgery. On the other hand, the global approach as a prospective reimbursement, can only meet some medical cares. So, it is necessary to design a localized prospective payment system for hospitals.

### Acknowledgments

The authors need to thank all health insurance staffs of Isfahan province who helped them in carrying out this research. This study was approved by studies and research health insurance

administration. Code of this project was 8920450 in 2011.

### Conflict of interests

There was no conflict of interests.

### Authors' contributions

Ebrahimi Dourcheh R and Rahimi M designed research; Ebrahimi Dourcheh R and Rahimi M conducted research; Fatahpour AH analyzed data; and Rafiee N wrote the paper. Rafiee N had primary responsibility for final content. All authors read and approved the final manuscript.

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