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Insurance Deductions as a Critical Bottleneck for Hospital Revenues: Evidence from Iran

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Abstract

Background

The healthcare sector is a crucial component in the development of any nation. Within this sector, hospitals, due to the escalating costs of medical services, have become one of the most financially demanding aspects of the healthcare system. One of the primary revenue streams for hospitals is the provision of services to insured patients. However, in certain instances, insurance companies deduct amounts from the total claims made by the hospitals. These deductions, unfortunately, lead to a decrease in hospital revenues. This study aimed to explore the magnitude and reasons behind these deductions imposed by insurance companies on hospitals.

Methods

This cross-sectional study was conducted in the capital of Western Azerbaijan Province, Iran, for three months in 2019. Medical records of insured inpatients in the four hospitals formed the statistical sample of the study. Open-ended interviews were carried out with senior insurance and revenue experts (N = 10) in the hospitals.

Results

A total of 329 medical records of insured patients were studied in four hospitals. Most of them (62.9%) had Social Security Organization insurance. The average length of hospitalization, costs, and deductions were higher in the teaching hospital. Deductions were made for 40–50% of the medical records. The most common deductions were for drugs and consumables. There was a statistically significant difference between the insurers of Social Security Organization and Iran Health Insurance Organization regarding the number of deducted items in the medical records ($p = 0.001$). The senior experts declared the weakness of the fee-for-service payment method and the advantage of the global method regarding deductions.

Conclusions

Deductions affect hospital revenues. Reducing the deductions requires double attention. At the operational level, human errors, standardization of procedures, and at the macro level, consideration should be given to overhauling the payment system.

Introduction

Providing effective and efficient medical services to all citizens is a fundamental responsibility of the government. For these health services to operate optimally, they must be adequately funded. The health sector significantly contributes to a country’s development (1).The existence of severe shortages in the provision of financial resources in the health systems of many countries, including Iran, suggests the optimal use of facilities and increased productivity as inseparable components of management (2).

In this context, the ever-increasing costs of medical services have made hospitals one of the most expensive units in the health system. These units account for 2% of the GNP and 51–81% of public health resources in developing countries (2, 3). In other words, hospitals account for about 42% of the current government spending on the health system (4). Developing and less-developed countries incur most of their healthcare costs in hospitals. This amount (60–80 percent) is very high compared with that in developed countries (up to 41 percent) (5).

The effective management of hospitals depends on mastering and controlling financial performance and increasing the efficiency of their revenues (6). Hospitals primarily generate revenue through the provision of services to insured patients, which constitutes a significant portion of a hospital’s income (7). According to published statistics, approximately 92% of Iran’s population are insured by health insurance companies (8).

Before insurance companies reimburse the costs, they review the financial records of insured patients provided by hospitals. In some instances, deductions are made from the total claimed amount. Essentially, these deductions represent the difference between the amount that should have been paid and the actual amount (9).Some factors leading to deductions include poor documentation, improper organization of the hospital's financial and accounting affairs, and incorrect methods of obtaining information (10).

In addition to the fact that deductions do not realize a large amount of hospitals' revenue despite the provision of services, deductions also have other consequences (7, 9, 11). Deductions from the bills that hospitals send to insurance companies are considered from two perspectives. First, deductions are part of the hospital's revenue, which is not actually collected. Second, bills subject to deductions require a long processing time, which causes losses and dissatisfaction with hospitals (12, 13).

Although a significant amount is spent on hospitals, resources are not used properly because of inefficiencies in spending and revenue generation (14). Generally, 51% of national health resources are wasted in hospitals (15). In this situation, insurers play a vital role in reducing costs and providing optimal services to the healthcare system (16). Though the source of funding for hospitals is the insured, it is a challenge to collect all insurance claims from insurers (9).

In Iran, national insurance is on the government's agenda, and the number of insured people is increasing. The overall income of medical centers also depends on contracts with insurance organizations. Insurance companies are always looking for ways to control costs, and one way to do this is to process patients' bills. If hospital staff are unfamiliar with insurance deductions, this leads to a reduction in income and ultimately to dissatisfaction with the centers (17). According to some studies, factors such as the educational nature of the hospital, the staffs lack of experience in documentation, and the arrival of new students are the reasons for training in the documentation of Medical Records (MRs) and employment of inexperienced staff in the finance department and their lack of familiarity with insurance laws is one of the factors that lead to deductions (18).

In Iran’s public assistance healthcare delivery system, more than 40% of healthcare expenditure is spent on inpatient and outpatient services. The Ministry of Health and Medical Education (MHME) accounts for 70% of all hospitals and is the leading provider of inpatient services at medical science universities (19).

In this context, public hospitals have two sources of funding: the government (through the MHME and Medical Universities) and reimbursements from the Social Security Organization (SSO) and the Iran Health Insurance Organization (IHIO) based on fee-for-service (FFS) and per-diem payments (20).

With a better and more accurate understanding of the causes of deductions, it is possible to take measures to increase the efficiency of hospitals and prevent the waste of financial resources (21). Therefore, researchers investigated the extent and causes of deductions by insurance organizations in hospitals.

Methods

This cross-sectional study was conducted for three months in the capital of Western Azerbaijan, Iran, in 2019. The Discounted MRs of hospitalized insured patients formed the statistical population of the first stage of the study in four hospitals with different affiliations. The study sample was determined based on previous studies (17) and the Cochran formula in a limited population (N = 329). The selected sample was proportionally distributed among the selected hospitals.

Data on the reasons, frequency and monetary value of deductions in the MRS were collected using a checklist. This checklist included the following items: MRS number, inpatient department, total cost per patient, amount deducted by the insurer, reason(s) for the deduction, inpatient department, and unit or department responsible for the deductions.

It took about two months from the time the doctors discharged the patients for the insurance experts to review the patients' records and identify any deductions. The research team examined these records.

Before income experts sorted the expense receipts from the MRS, the research team examined the selected MRS and noted the frequency, monetary value and causes of the deductions. They also registered the MR number, hospital, date, department name, specialty of the attending physician, and the name of the person who completed the checklist. Then, the hospital checklists was rechecked for any discrepancies or deficiencies, and the data were entered into EXCEL and SPSS software to describe and analyze the data against the objectives.

In the second step, structured short interviews were conducted with the senior insurance and revenue experts (N = 12). Insurance and income senior experts were asked about the percentage of MRS with deductions and payment methods to hospital physicians. In addition, respondents compared deductions among different payment methods (Supplementary 1).

Data Analyses

The Kruskal-Wallis and Shapiro-Wilk tests were used to determine the normality of the distribution of the dependent variables. Appropriate parametric or non-parametric tests were performed, depending on the normality of the data.

The validity of the checklist was confirmed by double-checking by experts in insurance and financial management (eight experts) in hospitals. The checklist was reliable because it has already been used in related studies (21, 22). The significance level for the tests was considered less than 0.05.

Results

In general, 329 MRs of insured patients were studied in selected hospitals in Western Azerbaijan, Iran, at 2019. All the MRS investigated belonged to the FFS payment method. The hospitals included a medical teaching center affiliated with Urmia University of Medical Sciences (96 MRs), a hospital affiliated with the Social Security Organization (SSO) (53 MRs), an Armed Forces hospital (75 MRs), and a private hospital (105 MRs). Most patients (62.9%) had an SSO insurance.

Table 1: Mean, standard deviation, and median of the investigated variables in selected hospitals

No	Hospital	Statistic	LOS	Number of deductions	Total cost (Rials)	Deductions amount (Rials)	Deductions percentage
1	Teaching	Mean	5.58	3.96	45232746	5297263	11.19
		SD	6.16	1.82	53802854	11528789	12.67
		Median	4	4	25692348	1862497	7.7
2	Military	Mean	2.45	1.76	14461599	314417	2.26
		SD	2.27	1.09	12427111	710857	5.03
		Median	2	1	12067588	62500	0.57
3	Private	Mean	2.05	2.21	14287692	888911	5.99
		SD	1.64	1.34	8863720	1451977	8.92
		Median	1	2	11417445	204678	1.81
4	SSO	Mean	2.45	1.91	22290149	145676	0.78
		SD	2.1	0.904	20900517	179028	0.96
		Median	2	2	18206488	84360	0.44
5	Total	Mean	3.24	2.56	24646046	1924544	5.82
		SD	4	1.65	33917964	6637807	9.65
		Median	2	2	14866764	229100	1.79

Statistical calculations (Table 1) showed that the average length of hospitalization, costs, and deductions was higher at the teaching center. The lowest percentage of deductions occurred in the hospital affiliated with the SSO.

Table 2: Frequency of causes of deductions with the highest frequency in selected hospitals

No	Reason for deductions	Deductions group	N	%
1	Failure to request the correct number by the anesthesiologist	anesthesia	45	24
2	Full description of anesthesia (insert adjustment codes)	anesthesia	30	16
3	Failure to request supplies or medicine in the right amount in ward	Medicines and supplies in the ward	29	15
4	Price change (tariff difference)	Medicines and supplies in the Operating Room (OR)	25	13
5	Price discrepancy between the insurer and the hospital	Medicines and supplies in the ward	16	9
6	Not including insurance or additional requests	Medical lab.	16	9
7	Failure to request supplies or medicine in the right amount in OR	Medicines and supplies in the OR	15	8
8	Non-compliance of the requested code with the surgery description	Surgery fees	12	6

The most common deductions were for medications and supplies requested in the inpatient department or operating room for surgeries (Table 2).

Table 3: The frequency of the number of items subject to deductions in the MRs based on the insurance fund

Insurer	Deductions Frequency / Hospital	1	2	3	4	5	6	7	8	9	10
SSO	Teaching	6	9	11	5	4	4	1	1	0	0
	Military	23	2	0	0	0	0	0	0	0	0
	Private	22	20	7	3	1	0	0	0	0	0
	SSO	0	0	0	0	0	0	0	0	0	0
	Total	**51**	**31**	**18**	**8**	**5**	**4**	**1**	**1**	**0**	**0**
IHIO	Teaching	1	4	10	13	12	9	0	1	1	1
	Military	17	20	8	3	0	2	0	0	0	0
	Private	18	10	10	7	3	2	1	0	0	0
	SSO	21	18	13	0	1	0	0	0	0	0
	Total	**57**	**52**	**41**	**23**	**16**	**13**	**1**	**1**	**1**	**1**
Total	Teaching	7	13	21	18	16	13	1	2	1	1
	Military	40	22	8	3	0	2	0	0	0	0
	Private	40	30	17	10	4	2	1	0	0	0
	SSO	21	18	13	0	1	0	0	0	0	0
	Total	108	83	59	31	21	17	2	2	1	1

The deductions with high frequency in patients with IHIO were higher than those in patients with SSO insurance. The deductions with high frequency was also higher in the medical teaching center (Table 3).

Table 4: The number of deductions compared to total cost based on the insurance type

Insurer	Hospital	Number of deductions items in percent groups (%)				
		<1	1-4	4.01-8	8.01-20	> 20
SSO	Teaching	3	8	12	14	6
	Military	18	5	0	0	2
	Private	20	20	5	4	5
	SSO	0	0	0	0	0
	Total	41	33	17	18	13
IHIO	Teaching	3	10	16	15	9
	Military	30	14	3	2	1
	Private	15	16	5	10	5
	SSO	44	8	1	0	0
	Total	92	48	25	27	15
Total	Teaching	6	18	28	29	15
	Military	48	19	3	2	3
	Private	35	36	10	14	10
	SSO	44	8	1	0	0
	Total	133	81	42	45	28

In 8.5 percent of the MRs (28 cases), more than 20 percent of the total cost was subject to deductions (Table 4).

The Wilcoxon test showed a statistically significant difference between the monetary value of deductions and the average length of stay ($p = < 0.001$). The Mann-Whitney test showed that, there was no statistically significant difference in the monetary value of deductions ($p = 0.25$) and

the percentage of deductions (p = 0.92) with respect to the total amount of each MR between IHIO and SSO.

The Mann-Whitney test showed a statistically significant difference between the insurers of SSO and IHIO regarding the number of deducted items in MRs (p = 0.001). IHIO insurers have a more number of deducted items.

The Kruskal-Wallis test showed that there was a statistically significant difference among the selected hospitals in the monetary value of deductions [($\chi 2$ (3) = 31.144), (p < 0.001)]. The highest and the lowest monetary value of deductions were for the medical teaching center and SSO-affiliated hospital, respectively.

The Kruskal-Wallis test showed a statistically significant difference between physicians in the monetary value of deductions in patients' MRs ($\chi 2$ (3) = 21.990, (p < 0.001)). The highest and lowest financial values in deductions were for anesthesiologists and para-clinical specialists.

Two to three people from each hospital participated in the interviews (ten of the 12 experts). Ten face-to-face interviews were conducted in hospitals, as they were comfortable. Apart from the participant and researcher, no other person was at the interview site.

Of the ten interviewees, six were male. The age of the participants ranged from 26 to 45 years. The interviews lasted between 8 and 12 minutes.

Insurance and income senior experts stated that deductions were made for 40-50% of MRs in studied hospitals (The maximum number of deductions was in the MRs in teaching medical center). They also announced the FFs and Global (a method like Per Case) payment methods in addition to the salary of government hospital physicians. Regarding the comparison of deductions between the FFS and Global payment methods, the senior experts declared the weakness of the FFS payment method and the absolute advantage of the Global payment method.

Discussion

The findings indicated that deductions were in some MRs of hospitalized patients covered by the two Basic insurance companies in the country. Interviews with insurance and revenue senior experts revealed that deductions were made for 40–50% of the MRs of insured patients, accounting for more than 90% of hospitalizations. This deficiency was observed in all hospitals with different ownership types, ultimately affecting the hospital revenue.

As complex organizations, hospitals consume a significant portion of the health system's budget (23). Hospitals account for one dollar of every three dollars spent on healthcare (24). One of the challenges of the Iranian health system is hospital spending (25), which highlights the importance of managing financial resources in hospitals.

The results showed that the main reasons for deductions were additional requests by doctors, especially surgeons and anesthetists, and incorrect coding of surgical procedures, which was one of the most common errors, especially in women (26). These issues were reported in a study by Imani (27). Additional code requests were made when the codes requested by the surgeon did not match the procedure description on the relevant form. In some cases, the surgeon demanded an additional code for the procedure required for the primary surgery, resulting in a deduction.

In studies conducted by Imani (27) and Safdari (28) in hospitals affiliated with the Tehran University of Medical Sciences, surgery, and anesthesia costs were the main factors for deductions in most SSO and IHIO inpatient bills. These findings are consistent with the results of the present study.

In another study by Jannati (29), most deductions were for anesthesia costs due to overcharging, which is consistent with the results of the present study. Asgari et al. reported the highest monetary value of deductions for surgical fees (28.4% of the amounts claimed), again consistent with the results of the present study (30).

Karami (2013) showed (31) that the most common reasons for deductions in SSO patients were requesting extra from the tariff for services, more medications and consultations, more time for anesthesia, an additional fee for anesthesia and surgery services, extra anesthesia adjustment codes, and exceeding the number of primary surgery codes in an area of the body.

From a statistical point of view, there is a significant difference in the monetary value of deductions between IHIO and SSO insurance funds. The SSO acts as a provider and purchaser of insured health services, which can justify the low deductions. In other words, faster coordination and communication in the proclamation of justification of tariffs within this organization will soon be effective.

From another point of view, the quality of documentation by doctors, nurses, and other related staff is poor, which is reflected in insurance deductions in Iran (32–34). In this method (FFS), the involved physicians and personnel record all services provided with defined codes in the MRS and charge each service separately.

The causes and frequency of deductions in related studies showed that this problem was more pronounced in the FFS payment system (19). Fee-for-service reimbursements encourage providers to order more services, and the system moves toward volume-driven care rather than value-driven care (35). There seems to be a general agreement that FFS is an immoral practice that leads to oversupply, inefficiency, and uncontrollable healthcare costs (36).

Conclusion

Deductions affect hospital revenues. At the operational level, deductions are a unique cost control problem in the Iranian healthcare system and one of the challenges of financial management in hospitals. Human error is one of the main reasons for these deductions. Therefore, it is necessary to train doctors and staff to ensure proper documentation. It is also essential to standardize policies and coordinate the implementation of insurance policies.

The inclusion or non-inclusion of insurance payments, as well as the coverage limits of insurers' services with regard to the frequency of prescriptions, should not be neglected.

At the policy level, the fundamental solution to hospital deductibles in Iran is to revise FFS payments. Shifting from FFS to other payment methods seems to be one of the most effective ways to address this shortcoming.

Declarations

- Ethics approval and consent to participate

This project was approved by the University Research Ethics Committee of Urmia Medical Science University (approval code: UMSU.REC. 1398.340).

All methods used in this study were carried out in accordance with relevant guidelines and regulations.

Verbal Informed consent was obtained from all participants. The informed consent method was approved by the University Research Council at the Deputy of Research Affairs because of the convenience of respondents at the beginning of the interview session.

- Consent for publication

Not applicable

- Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

- Competing interests

Authors stated that there is no case of conflict of interests.

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- Authors' contributions

Contribution to conception and design: BN and DJL. Substantial contribution to the acquisition of data: BN and SAO. Substantial contribution to analysis and interpretation of data: BN and HY. Drafting the article: BN. Final approval of the version to be published: BN and HY.

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