



ORIGINAL ARTICLE

Comparing Performance Indicators of Obstetrics and Gynecology Ward at Yazd Educational Hospitals with Expected Limits of Indicators, 2015

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Abstract

Objectives: The purpose of this study was to evaluate the performance indicators for obstetrics and gynecology wards in Iran.

Methods: This study was designed as a cross-sectional study and was carried out in obstetrics and gynecology wards of Afshar and Shahid Sadoughi hospitals in 2015. The information required for the performance indicators was gathered through questionnaires, statistical forms, and direct observation. In several tables, performance rating and performance status are presented using the Likert scale index based on the expected limits.

Results: According to the results of the categories of input indicators, the bed occupancy rate of Afshar Hospital's obstetrics and gynecology ward was, at 83%, higher than expected (79%), and that in Shahid Sadoughi Hospital (at 69%) was lower than expected. For medicinal methods and nonmedicinal methods of pain alleviation, the index process at Afshar Hospital was much lower than expected (40%). In Afshar Hospital, patient satisfaction at discharge was about 66.74%.

Conclusion: Effective steps can be taken to improve the input and output criteria: allocating appropriate physical space, examining the reasons for low bed occupancy rate by using complex analytical models, and in order to study the reasons for large number of cesarean section childbirth, it was recommended to place more emphasis on training of pregnant mothers and to inform them about the side effects of cesarean section and advantages of natural childbirth.

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1. Introduction

There are important aspects of system performance assessment of each organization that help evaluators gauge how it is doing based on established standards including assessment of the use of resources, objectives, and strategies [1].

The healthcare sector, especially organizations such as hospitals, provides the best way to ensure that good quality health services are widely available [2]. In addition, key units of hospitals in the healthcare system play a key role in providing health services and treatment [3]. To evaluate healthcare, each country has its own standards and criteria that feature standards from other countries and even different regions. However, the healthcare system (be it in partnership with the public sector or the private sector) should establish clear and comprehensive standards to evaluate the performance of healthcare establishments. Therefore, to assess hospitals, we need to adopt effective and appropriate measures. Different sources of different definitions of the term index or indicator are provided.

According to the World Health Organization definition, indicators or markers are variables that directly or indirectly contribute to measurable changes. This means that a given case is clear and therefore can be used to measure changes [4,5]. The feature common to all definitions is that the information provided by performance indicators (10) reflects the quality of the healthcare system and acts as a guide to determine the course of future actions and research mark required by health executives [6]. There are a variety of statistical indicators measuring the performance of healthcare institutions that can serve as a precise strategy and remove obstacles from the development of health services [7].

The use of indicators suggested different ways to classify them. The common classification criteria are divided into five categories.

Indicators of inputs, process, outputs, outcomes, and indicators in determining this classification system are based on a logical framework in which the inputs to outputs are as follows:

1. Indicators of input: specifically point out that the slides are activities to be done
2. Parameters of the process: monitoring and supervising of operational activities
3. Indicators of output: results of operations measures include knowledge, attitude, and behavior changes resulting from the activities
4. Indicators related to outcome: the long-term effects of specific activities or results and include changes in the health status of the community
5. Key indicators: refer to causes of diseases, or other issues such as environmental factors or unsanitary environmental conditions [8,9]

Because of the weak performance monitoring system in hospitals across Europe, the World Health Organization Regional Office for Europe is gathering evidence on the performance of hospitals. To this end, a new project whose aim is to benefit the 52-nation region by developing and publishing a comprehensive and flexible framework for evaluating the performance of hospitals, has begun to establish “performance assessment tools to improve the quality of hospital” [10].

Several studies have been conducted on measuring performance indicators for hospitals. In some studies [11,12], indicators such as average bed occupancy, bed turnover interval, and number of cesarean deliveries had been used.

Ebadi Fard et al [13] used indicators such as rooming-in technique, breastfeeding, staff and patient satisfaction, as well as round and morning reports in evaluating the performance of obstetrics and gynecology wards.

As we know, the Gynecology and Obstetrics Hospital as one of the main public hospital, the only part that human life starts since fetal and maternal and fetal health issue which arises. Development of indicators and evaluations using these indicators in obstetrics and gynecology wards will help us gauge how well this section performs and if the sector is functioning effectively within hospitals and in service to their patients. As a result of this study, we decided to evaluate the functional status of the obstetrics and gynecology ward in Yazd educational hospitals using the indicators that we have developed.

2. Materials and methods

This study was designed as a cross-sectional study and was carried out in the obstetrics and gynecology wards of Afshar and Shahid Sadoughi hospitals in 2015. The information required for the performance indicators covering input, process, and output was obtained through questionnaires, statistical forms and questionnaires, data forms, direct observations, and interviews. The study was performed in two separate phases, as discussed in the following subsections.

2.1. First phase: development of indicators

In the first phase of the study (review of literature), 60 articles were reviewed, of which 42 were complete papers and 18 were abstracts. Forty-five performance indicators were found to be related to obstetrics and gynecology wards.

Next, these indices were classified as input, process, and output parts, and the data were gathered in the form of a questionnaire. In the second phase, these forms were given to 20 specialists in this field (5 obstetricians and gynecologists, 8 authorities from obstetrics and gynecology wards, and 7 validation experts). These

Table 1. Performance index of input in obstetrics and gynecology ward compared with expected limits of indicators.

Row	Development indicators	Expected values (standard)	Ward performance		Functional status	
			Afshar	Sadoughi	Afshar	Sadoughi
1	Ratio of obstetricians and gynecologists to inpatient bed	2 people up to 20 beds; next, 1 per 10 beds will be added (13)	7 obstetricians and gynecologists to 19 inpatient bed	7 obstetricians and gynecologists to 38 inpatient bed	Much higher than expected	Higher than expected
2	Patient per capita for nurse	29 patients per nurse (13)	17 patients per capita for nurse	40 patients per capita for nurse	Much higher than expected	Lower than expected
3	Average bed for each pain room	1 to 2 (15)	5 beds	2 beds	Much lower than expected	As expected
4	Ratio of fetal monitoring device to childbirth bed	1 in each delivery block (15)	3 devices	7 devices	Higher than expected	Much higher than expected
5	Standard contents of childbirth pack	Scissors straight-Scissors episiotomy-Forceps hemostat-shan-Pat Gale Ring Feb seps-Gas and cotton-Gan-towels (15)	100% (13)	100%	As expected	As expected
6	Presence of fence for all beds of the ward	100% (13)	100%	100%	As expected	As expected
7	Ratio of midwife to the patient entering labor	1 to 2 (15)	3 to 5	1 to 2	Lower than expected	As expected
8	Ratio of midwife to the patient who is in recovery after labor	1 to 2 (15)	—	1 to 6	—	As expected
9	Mean record of management in the ward	1. Having at least a midwifery degree and at least 2 y of experience in the block period supplementary documents approved by the Bureau of Labor and Population Health, Youth, Schools and Families of the Ministry of Health 2. Having at least a bachelor's degree in obstetrics and gynecology and at least 3 y of experience in the block as well as at least 30 h of courses in public administration	27 y with the terms of paragraph 2	23 y with the terms of paragraph 2	Much higher than expected	Much higher than expected

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Table 1 (Continued)

Row	Development indicators	Expected values (standard)	Ward performance		Functional status	
			Afshar	Sadoughi	Afshar	Sadoughi
		documents and supplementary documents approved by the Office of Population, Health, Young People, Schools and Families of the Ministry of Health (16)				
10	Bed occupancy ratio	75% (13)	83%	69%	higher than expected	Lower than expected
11	Number of postpartum beds for each labor bed	For every flat delivery, 6 postpartum xbeds (17)	Recovery bed with pain room	2 postpartum beds for each labor bed	–	Much lower than expected
12	Ratio of midwife to the patient who is in cesarean section	1 to 1 (18)	1 to 1	1 to 1	As expected	As expected
13	Oxygen output and central suction for each bed	1 device per bed (15)	1 device per bed	1 device per bed	As expected	As expected
14	Portable suction device in labor room	1 device per bed (15)	Devices; each room has 5 beds	1 device in each pain room	Lower than expected	As expected
15	Number of hygienic service for each pain room	1 hygienic service per pain room (15)	1 hygienic service per pain room	1 hygienic service per pain room	As expected	As expected
16	Average bed for each ward room	Average of two beds per room (15)	2 beds	2 beds	As expected	As expected

Table 2. Performance index of process in obstetrics and gynecology ward compared with expected limits of indicators.

Row	Development indicators	Expected values (standard)	Ward performance		Functional status	
			Afshar	Sadoughi	Afshar	Sadoughi
1	Access to emergency trolley drugs in preeclampsia	100% (13)	100%	100%	As expected	As expected
2	Percent of observing breastfeeding instruction	100% (13)	100%	100%	As expected	As expected
3	Use of nonmedicinal methods of pain alleviation	100% (15)	40%	100%	Much lower than average	As expected
4	Use of medicinal methods of pain alleviation	100% (15)	40%	100%	Much lower than average	As expected
5	Percent of observing rooming in instruction	100% (15)	100%	100%	As expected	As expected
6	Average time of hospitalization for natural labor	24 h (15)	1.02	1.13	As expected	Lower than expected
7	Presence of registration form or reporting system of medical errors	100% (15)	100%	100%	As expected	As expected
8	Average time of hospitalization for cesarean section	48 h (15)	2.52	2.09	Lower than expected	As expected

experts were then asked if more indicators should be added; eventually, 47 indicators were added. Then, an interview was conducted with 30 patients from the selected hospitals of Yazd who were being discharged and stayed in the hospital at least for 1 day. In this phase, 16 indicators were added to this section.

Several rounds of Delphi were conducted; as a result, 14 indicators were confirmed in the first round, 10 indicators in the second round, and six indicators in the third round.

Finally, the indicators were classified as follows: 16 input indicators, eight process indicators, and six output indicators.

For a full description of these steps, we refer the readers to the article of Asqari et al [14].

2.2. Second phase: calculation of the performance indicators

At this stage of development, for each of the previous phase of the study a table was prepared that shows the indicator and the data needed to calculate the index; an explanation is added that describes how to calculate the index. Then, in reference to the literature, the Ministry of Health, and the Department of Evaluation Guidelines for Health, most indices were determined based on standards.

Table 3. Performance index of output in obstetrics and gynecology ward compared with expected limits of indicators.

Row	Development indicators	Expected values (standard)	Ward performance		Functional status	
			Afshar	Sadoughi	Afshar	Sadoughi
1	Patient satisfaction	90% (13)	66.74%	86.2%	Lower than expected	Much lower than expected
2	Personnel satisfaction	90% (13)	79.8%	88.42%	Lower than expected	Much lower than expected
3	Hospital infection	25% (19)	0%	0.1%	Much lower than expected	Much lower than expected
4	Neonatal death to total labor	This amount should not exceed 2% of the total deliveries (13)	0.4%	0.53%	Much lower than expected	Much lower than expected
5	Ratio of cesarean to total labor	5–15% of all pregnancies (20)	34.07%	38.43%	Much lower than expected	Much lower than expected
6	Percentage of trained patient	100% (13)	100%	100%	As expected	As expected

In the following tables, we present the data for each of the indicators, including the indicator, the way the index is calculated, the expected value, the index performance, and the rating for sector performance. The rating performance and the condition of the putting performance as measured with the Likert scale were determined using the prospective index.

This means that when the obtained value is much higher than expected, it is rated 5; higher than expected value, 4; index value is as expected, 3; lower than expected, 2; much lower than expected, 1. To replace the performance indicators in these tables, allow comparison with standard indices (about as expected).

3. Results

According to the phases of the study, the following results were obtained on developed indicators: indicators of input (Table 1), indicators of process (Table 2), and indicators of output (Table 3). The expected limits of indicators, performance of hospital wards, and the rating of functional status are also expressed.

4. Discussion

There are several important aspects of system performance assessment of each organization that help evaluators gauge how it is doing based on established standards, including assessment of the use of resources, objectives, and strategies. The use of performance indicators to assess these aspects is one way to reflect the quality of the healthcare system, and serves as a guide for future actions [1]. The healthcare sector, especially organizations such as hospitals, provides the best way to ensure that good quality health services are widely available [2].

This article aimed to determine the performance of women and maternity centers at the above-mentioned hospitals by using codified performance criteria in an attempt to take effective steps to improve the performance of such hospital centers by identifying the weak points as well as areas that require improvements.

Findings obtained from input criteria (Table 1) show that the inpatient bed occupancy rate at the Women and Maternity Center at Afshar Hospital was 83%, which was higher than expected (79%), and 69% at Shahid Sadoghi Hospital, which was lower than expected (79%). In the study of Ebadi Fard et al [13], the inpatient bed occupancy rate of the Women and Maternity Center at Rasul-e Akram Hospital in Tehran was 63%, which was lower than the occupancy rates for the hospitals studied in this article [13]. Increasing bed occupancy rate and improving its performance require comprehensive and long-term design and planning. Bed occupancy rate can be increased by increasing the number of

inpatient reception for each hospital bed, which consequently increases the bed turnover rate.

Determining the hospital needs in the area of human workforce is a common challenge for all hospitals [21]. At Afshar Hospital, the two criteria—ratio of Women and Maternity specialists to active beds (7 specialists to 38 active beds) and patients per capita per nurse (40 patients per nurse)—were larger than expected. In addition, the average number of beds for each labor room at Afshar Hospital (5 beds at each labor room) was also lower than expected. Thus, the design of the labor room must not include more than two beds per room, because labor rooms with more than two beds would disturb the mothers' comfort [22].

Results obtained for processing criteria (Table 2) show that the pharmacologic and nonpharmacologic methods of reducing pain at Afshar Hospital (40%) were significantly below the expected level. Pain during childbirth has been described as one of the most severe pain that can be experienced and receives due attention owing to various issues such as effect on the mother's psychological condition, childbirth process, and possible complications of drugs on the embryo.

Today, one of the major issues in modern midwifery deals with prescribing appropriate sedative drugs to reduce pain during childbirth. Afshar Hospital only used pharmacologic epidural pain-reducing drugs, if necessary; in other words, among the three methods (systematic, epidural, and entonox drugs), only one method (33.4%) was used, and this was below the average level. In terms of analgesics prescribed for mothers by the epidural method, the reference book reported that total analgesia, relative analgesia, and no analgesia accounted for 85%, 12%, and 3%, respectively. Another discussed criterion is the non-pharmacologic method of pain reduction. Because pain relief is an important part of healthcare and because international policies are aimed at reducing the number of cesarean (C) section surgeries, developing treatments based on nonpharmacologic methods, and reducing childbirth pain by related specialists [23], options that use nonpharmacologic methods of pain reduction were proposed according to the instructions issued by labor and childbirth centers; these include the use of hot water bag, ice bags, aromatic essences such as rose and lavender, bathtub for hydrotherapy, and birth ball.

If requested by the patient, Afshar Hospital provides only two methods, birth ball and aromatic essences (40%), the use of which was significantly below the average level. Bastard and Tyran [24] studied the effect of aromatherapy on the fetus and concluded that despite the essential oils passing the placental barrier, they are not toxic for the fetus. Also, Burns et al [25] reported that aromatherapy not only reduces anxiety and pain during childbirth, but also decreases the need for painkillers by 2%, and as a result reduces healthcare costs.

Findings obtained for output criteria (Table 3) show that the percentage of C-section performed at both hospitals was far below the expected value. In recent decades, there has been an increasing trend in the number of C-section performed in all parts of the world, which was also confirmed by the DHS. The number of women who had C-section delivery has increased in both developed and developing countries [26]. Regarding the number of C-section performed at Sadoughi Hospital, it must be pointed out that this hospital is considered as a central unit where many risky pregnancies are referred to, which is one of the reasons for the large number of C-section procedures performed in this hospital. Results of studies in England showed that risk of mother's death due to C-section surgery was three times that of vaginal childbirth [27]. Studies conducted in England [28], United States [29], and South America [30] indicated the increased number of C-section surgeries performed.

Satisfaction among women relating to childbirth cares was the determining factor in the psychological health of the family and the society, and is considered one of the most important criteria in the quality of care for women based on the viewpoint of care providers, policymakers, and health authorities. Patient satisfaction level after discharge from Afshar Hospital was about 66.74%, which was considerably lower than expected. In their study, Curtright et al [31] reported that patient satisfaction is one of the effective criteria for the development of clinic performance management system [31]. Ebadi Fard et al [13] reported the level of satisfaction in patients of Women and Maternity Center at Rasul-e Akram Hospital as 88%, which was lower than expected, but still greater than the satisfaction rate for the hospitals studied in this article [13].

According to the results, input criteria such as bed occupancy rate, patients per nurse, ratio of women and maternity specialists to active beds, and average number of beds per labor room were significantly lower than expected. Effective steps can be taken to improve these criteria by allocating appropriate physical space, providing a sufficient human workforce appropriate to the number of patients, and examining the reasons for low bed occupancy rate by complex analytical models; the required equipment and services must also be provided at Afshar Hospital in relation to the pharmacologic and nonpharmacologic methods of pain relief to bring this criterion to an acceptable level. Regarding the output criteria, in order to study the reasons for the large number of C-section deliveries at the two hospitals, it was recommended to place more emphasis on training of pregnant mothers and to inform them about the side effects of C-section and the advantages of natural childbirth, and to increase the inclination of pregnant mothers toward natural childbirth. This is partly covered during the educational courses prior to the pregnancy, but it is recommended that majority of materials covered in these courses be about these issues; it is possible that

the reasons for the large number of C-section deliveries at these hospitals are medicine-related, thereby warranting further investigation.

Patient satisfaction rate at both hospitals, especially at Afshar Hospital, was lower than the standard limit, where the presence of friendly personnel and responsible midwives, hiring a larger number of personnel at peak hours, providing suitable amenities, reducing the pain, etc., are among the ways to improve patient satisfaction. Because of the average level of personnel job satisfaction in this study, the relevant authorities must pay attention to the factors that increase job satisfaction so that it consequently leads to improved healthcare services for the patients. In this regard, paying appropriate remuneration and bonuses (for hard work), creating acceptable occupational standards to reduce occupational stress and increase job efficiency, applying appropriate merit/demerit systems, and creating amenities and sports facilities for employees would increase job satisfaction among this population.

Conflicts of interest

All authors have no conflicts of interest to declare.

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References

1. Sajjadi H, Hariri M, Karimi S, et al. Self performance evaluation of the hospitals and training centers of Isfahan University of medical science by using the Organization Excellence model. *Res Med* 2008;32:227–31.
2. Arab M, Eskandari Z, Rahimi A, et al. Causes of readmission for patients in hospitals of Tehran. *Hospital* 2010;9:43–55.
3. Arab M, Zareei A, Rahimi A, et al. Analysis of factors affecting the duration of stay of patients in state hospitals in Lorestan. *Hakim* 2009;12:27–31 (In Persian).
4. Jonidi N, Sadegi M, Ezadi M, et al. Comparative performance indicators of a hospital in Tehran with the national standards. *Mil Med* 2010;12(4):223–8.
5. Arab M, Tajvar M, Akbari F. Relation between leadership styles and hospital performance indicators. *J Gazvin Univ Med Sci* 2005; 10(4):70–5 [In Persian].
6. Vlieland V. General hospitals strategic responses to performance indicators in health care: an exploratory study. Rotterdam: Erasmus; 2009.
7. Chozokli N. Identifying performance indicators and patients satisfaction in hospitals affiliated with Tehran university of medical science. MS thesis, Health Faculty; 2005. p. 6, 78.
8. Esmaeili T. Checking the teaching hospitals indicators and comparing them with ministry of health standards. MS degree, Iran University of Medical Science; 2003.
9. Groene O, Skau J, Frqllich A. An international review of projects on hospital performance assessment. *Int J Qual Health Care* 2008 Jun;20(3):162–71.

10. Veillard J, Champagne F, Klazinga N, et al. A performance assessment framework for hospitals: the WHO regional office for Europe PATH project. *Int J Qual Health Care* 2005 Dec;17(6): 487–96.
11. Mikelaee M. Management performance evaluation and compare with available indicators in Alzahra hospital in Esfahan. MS degree. Iran University of Medical Science, Tehran; 1998–1999.
12. Esmacili, T. checking the teaching hospitals indicators and comparing them with ministry of health standards. (Ms Degree). Iran University of medical science, faculty of management and medical information; 2003.
13. Ebadi Fard AF, Choopani A, Saberi Anari H, et al. Comparing performance indicators of obstetrics and gynecology ward with expected limits of indicators. Published by Tehran University of Medical Sciences; 2013. p. 51–60. Available from: <http://journals.tums.ac.ir>.
14. Asqari R, Baghian N, Baghianimoghadam M, et al. Designing performance condition indicators of gynecology and obstetrics ward, 2014. *Middle-East J Sci Res* 2014;22(9):1281–7.
21. Zagheri Tafreshi M, Pazargadi M. Challenges in identifying nursing quality indicators. *J Nurs Midwifery* 2006;16(52):56–65.
22. Cunningham FG. Cesarean section and postpartum Hysterectomy. In: Cunningham FG, Norman FG, Larry CG, editors. *Williams textbook of obstetrics: From Appleton Lange Asimond Schusler Company*; 2001. p. 537–64. NewYork: USA.
23. Rakhshan N. The importance of health standards in hospitals. Proceedings of the first National Congress on Development Award and Health Organization Sublimity, Iran, Mashhad; 2012. p. 16.
24. Bastard J, Tiran D. Aromatherapy and massage for antenatal anxiety: its effect on the fetus. *Complemen Ther Clin Pract* 2006 Feb;12(1): 48–54.
25. Burns E, Blamey C, Ersser SJ. The use of aromatherapy in intrapartum midwifery practice: an observational study. *Complemen Ther Nurs Midwifery* 2000 Feb;6(1):33–4.
26. Najmi RS, Rehan N. Prevalence and determinants of caesarean section in a teaching hospital of Pakistan. *J Obstet Gynaecol* 2000 Sep;20(5):479–83.
27. Dosa L. Caesarean section delivery, an increasingly popular option. *Bull World Health Organ* 2001;79(12):11–73.
28. Leitch CR, Walker JJ. The rise in caesarean section rate: the same indications but a lower threshold. *Br J Obstet Gynaecol* 1998 Jun; 105(6):621–6.
29. Flamm BL, Berwick DM, Kabcenell A. Reducing cesarean section rates safely: lessons from a “breakthrough series” collaborative. *Birth* 1998 Jun;25(2):117–24.
30. Peipert JF, Bracken MB. Maternal age: an independent risk factor for cesarean delivery. *Obstet Gynecol* 1993 Feb;81(2):200–5.
31. Curtright JW, Stolp-Smith SC, Edell ES. Strategic performance management: development of a performance measurement system at the Mayo Clinic. *J Health Manag* 2000 Jan-Feb;45(1):58–68.