

Reasons for cancellation of elective operations at a major teaching referral hospital in Jordan

M. Mesmar,¹ N.J. Shatnawi,² I. Faori³ and Y.S. Khader⁴

أسباب إلغاء العمليات الاختيارية في مستشفى تعليمي مرجعي رئيسي للإحالة في الأردن

محمد مسمار، نواف شطناوي، إبراهيم فاعوري، يوسف صالح خضر

الخلاصة: إن إلغاء العمليات الجراحية الاختيارية التي جرى تحديد موعدها يؤدي إلى نقص في كفاءة استخدام غرف العمليات وإهدار للموارد. وتهدف هذه الدراسة الاستباقية المرتكزة على السجلات إلى تحديد معدلات وأسباب إلغاء العمليات الجراحية الاختيارية التي تمت جدولتها في مستشفى تعليمي كبير للإحالة في الأردن. فعلى مدى حقبة امتدت اثني عشر شهراً، سُجِّلَ 382 إلغاءً (3.6%) من بين 10485 عملية جراحية اختيارية تمت جدولتها. وقد بلغت الإلغاءات في الوحدة النهارية 27.5%، والإلغاءات للمرضى المعالجين في المستشفى 72.5%. وشكل الإلغاء لأسباب متعلقة بالمرضى 31.4%، ولأسباب إدارية 30.4%، ولأسباب طبية 38.2% من مجمل العمليات الملغاة. وكان أكثر أسباب إلغاء الجراحة متعلقة بالمرضى شيوعاً هو عدم حضور المريض. وأكثر الأسباب الإدارية شيوعاً لإلغاء العملية هو عدم توفر أسرة في المستشفى. ومع أن معدّل إلغاء الجراحات كان أقل من المعدّلات العالمية، إلا أنه يمكن تخفيض هذا المعدل عن طريق اعتماد بعض التدخلات الهامة ولاسيّما تحسين الاستفادة من أسرة المستشفى.

ABSTRACT Cancellation of elective scheduled operations leads to an inefficient use of operating room time and a waste of resources. This prospective records-based study aimed to determine the rate of and reasons for cancellations of scheduled elective surgical operations in a major teaching referral hospital in Jordan. Over a period of 12 months, cancellation was recorded in 382 (3.6%) of 10 485 scheduled elective surgical operations. Day unit cancellations accounted for 27.5% and inpatient cancellations for 72.5%. Patient-related reasons, administrative and medical reasons accounted for 31.4%, 30.4% and 38.2% of all cancelled operations respectively. The most common patient-related reason for cancellation was patient non-attendance. The most common administrative reason for cancellations was unavailability of hospital admission beds. Although the cancellation rate was low in comparison with the reported rates worldwide, reductions might be achieved by adopting some important interventions, especially better bed utilization.

Motifs d'annulation des interventions chirurgicales programmées dans un grand centre hospitalier universitaire de recours en Jordanie

RÉSUMÉ L'annulation d'interventions chirurgicales programmées conduit à une utilisation inefficace des plages opératoires disponibles et au gaspillage des ressources. La présente étude prospective, fondée sur des dossiers de patients, visait à déterminer le taux d'annulation des interventions chirurgicales programmées dans un grand centre hospitalier universitaire de recours en Jordanie, et les motifs de ces annulations. Sur une période de douze mois, 382 interventions programmées sur 10 485 (soit 3,6 % d'entre elles) ont été annulées. Les annulations concernaient pour 27,5 % d'entre elles des soins ambulatoires, et 72,5 % d'entre elles une intervention avec hospitalisation. Les motifs liés aux patients, les raisons administratives et les causes médicales représentaient respectivement 31,4 %, 30,4 % et 38,2 % de l'ensemble des annulations. L'absence du patient était le motif le plus fréquent des annulations liées à ces derniers. La raison administrative la plus courante était le manque de lits. Même si le taux d'annulation est faible par rapport aux autres taux dans le monde, il pourrait encore diminuer grâce à l'adoption de mesures importantes telles qu'une meilleure utilisation des lits.

¹Department of Orthopaedic Surgery; ²Department of Surgery; ³Department of Nursing; ⁴Department of Public Health, Faculty of Medicine, King Abdullah University Hospital, Jordan University of Science and Technology, Irbid, Jordan (Correspondence to Y.S. Khader: yousef.k@excite.com).

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Introduction

Considerable resources are invested in maintaining a well-functioning operating theatre. Cancellation of elective scheduled operations leads to an inefficient use of operating room time and a waste of resources [1–3]. The disruptions which cancellations create to patients, their families and the medical teams are high. Cancellation is a major problem in most hospitals. The incidence and reasons of cancellation differ from one hospital to another, with rates varying from 10% to 40% [4,5].

In a comprehensive quality improvement programme the rate of surgical cancellation is one of the quality indicators for operative theatres. The reasons for cancellations can be patient-related, administrative or medical. For each of these reasons, different interventions can be implemented to reduce cancellations to the minimum. The commonest reasons for cancellation of elective surgical procedures reported in previous studies included lack of theatre time [6], non-availability of recovery room beds and patients failing to attend [7].

This study was conducted to determine the rate and reasons for cancellations of scheduled elective surgical operations in a major teaching referral hospital in Jordan. Identifying the avoidable reasons would help to implement interventions to improve the efficiency of operating room services.

Methods

A prospective survey was conducted in King Abdullah University hospital between August 2005 and July 2006 to identify cancelled day-case and inpatient elective operations. This is the main teaching and tertiary referral hospital in the north of Jordan with 650 beds, 20 operating theatres and a 16 bed day-care surgery unit. Operating schedules are submitted to the operative suite for each working day at 15.00 the previous

day. Any additional elective operations after that time have to be approved by the senior consultant of anaesthesia. Emergency operations are booked as they appeared on the emergency board located in the theatre reception area and there is an assigned operative theatre for emergency cases. Life-saving emergency cases can be carried out by interruptions of any of the theatres according to the state of urgency.

Operative cancellations were defined as those cases that were booked in the operative list (schedule) and did not have the planned surgery on the intended date. All cancellations of scheduled elective operations of patients who did not attend for admission to the hospital or were not admitted because of bed unavailability were included. Patients who died before the time of their scheduled surgery were excluded.

Cancellations of elective scheduled operations in the period from August 2005 to July 2006 were reviewed prospectively. All cancellations were recorded in a predesigned form which included information about the age of the patient, hospital identification number, date of cancellation, type of operation, the surgeon and the anaesthetist, any associated medical problems and the presumed reasons for cancellations for inpatients and day care surgery unit. For each cancelled operation, the form was filled by the senior registered nurse in charge of the operative suite and signed by the consultant of anaesthesia in charge. The medical records of cancelled cases were reviewed in order to identify associated medical conditions, preoperative anaesthetic evaluations and recommended management plans to improve the preoperative status of patients with associated chronic medical problems. Patients who did not attend were contacted by the theatre secretary to establish the reason for non-attendance.

Cancellation reasons were classified by the authors into 3 major categories:

patient-related, administrative-related and medical-related.

Frequencies and percentages were reported to describe the data. Data were analysed using *SPSS*, version 15.

Results

Over a period of 12 months, 10 485 elective surgical operations were scheduled. A total of 10 103 elective operations were performed on the planned date. Cancellation was recorded in 382 cases (3.6%) (215 for admitted patients and 167 for non-admitted patients). Day unit cancellations accounted for 27.5% of all cancelled operations and inpatient cancellations for 72.5%.

Table 1 shows the reasons for cancellation according to the location of admissions. Patient-related, administrative-related and medical-related reasons accounted for 31.4%, 30.4% and 38.2% of the cancelled operations respectively. The most common patient-related reason for cancellation was patient non-attendance which accounted for 23.0% of all cancellations. Patients' request for cancellation accounted for 5.8% of all cancellations. The most common administrative reason for cancellations was unavailability of hospital admission beds which accounted for 20.7% of all cancellations. Acute medical illnesses were the most common medical reasons for cancellations.

Table 2 shows the number of cancellations according to surgical specialty, nature and location of admission. Cancellations among patients admitted for ophthalmic surgery accounted for 20.9% of all cancellations, while general surgical cancellations were 21.5% of all cancelled cases.

Discussion

Surgical cancellation is defined as a scheduled surgery which is not done at the intended date. Narrow or wide

Table 1 Reasons for cancellation of elective operations at a major teaching referral hospital in Jordan according to location of admissions

Reason	Inpatients		Day unit		Total (n = 382)	
	No.	%	No.	%	No.	%
Patient-related reasons	56		64		120	31.4
Patient failed to attend	30		58		88	23.0
Patient request	19		3		22	5.8
Patient not fasting	7		3		10	2.6
Administrative-related reasons	98		18		116	30.4
No bed available	68		11		79	20.7
Overloaded schedule	14		6		20	5.2
Lack of staff	7		1		8	2.1
Lack of equipment	6		0		6	1.6
No blood available	3		0		3	0.8
Medical-related reasons	122		24		146	38.2
Upper respiratory tract infection	35		14		49	12.8
High blood pressure	39		3		42	11.0
Unfit because of other medical conditions	22		1		23	6.0
Acute illness	7		1		8	2.1
Change of treatment plan	9		3		12	3.1
Abnormal laboratory results	7		0		7	1.8
Patient taking aspirin	3		2		5	1.3

definitions are adopted by different hospitals. Narrowly defined cancellations include admitted scheduled operations which are not performed on the intended date [8]. This study reported all reasons for cancellations including patient-, administrative- and medical-related reasons. The rate of

cancellation in this study was 3.6%. Hospitals that define cancellation narrowly have reported a rate of less than 10% [8,9], while hospitals that defined cancellations of all types have reported a rate as high as 24% [10–14].

Another source of variation in the reported rates of cancellations is the

approach to data collection, whether it is prospective or retrospective [15]. In this study, data on cancellation were collected prospectively; therefore, under-reporting of cancellations is expected to be minimal. The low cancellation rate at this hospital might be related to the monitoring of cancellation as a

Table 2 Number of cancellations of elective operations at a major teaching referral hospital in Jordan according to surgical specialties, nature and location of admission

Specialty	Total		Scheduled admitted patients		Scheduled non-admitted patients	
	No.	%	Inpatients	Day unit	Inpatients	Day unit
			No.	No.	No.	No.
General surgery	82	21.5	35	7	23	17
Ophthalmology	80	20.9	43	7	17	13
Orthopaedic surgery	69	18.1	33	5	16	15
Urology	62	16.2	24	8	17	13
ENT surgery	45	11.8	18	6	13	8
Neurosurgery	20	5.2	13	2	4	1
Gynaecology	12	3.1	6	1	4	1
Plastic surgery	8	2.1	4	0	3	1
Maxillofacial	4	1.0	3	0	1	0
Total	382	100.0	179	36	98	69

ENT = ear, nose and throat.

quality indicator in the hospital quality improvement programme.

For a multi-dimensional problem such as surgical cancellations, it is important to address major reasons that result in cancellations. Medical-related reasons contributed to 38.2% of cancellations. Among the medical reasons, acute medical illness contributed the most, with acute upper respiratory tract infection as the most common reason. These cancellations are considered unavoidable; no one would wish to risk the patient's life for an elective surgery. However, cancellation of elective operation for acute upper respiratory tract infections is controversial. There is debate that uncomplicated cases of upper respiratory tract infection can safely be anesthetized without increasing postoperative complications [16–19].

Elevated blood pressure as a cause for cancellations contributed to 11.0% of all cancelled operations. Long-standing hypertension may be associated with perioperative cardiovascular

complications [20] and perioperative cardiac death [21]. Preoperative elevated blood pressure on the other hand was not found to be associated with major perioperative cardiac complications [20,22]. However, patients with arterial blood pressure of > 210/120 mmHg (stage 4) present a real risk of perioperative complication and death. The uncertainty of the highest safe blood pressure for anaesthesia results in variations in practice [23]. Perioperative blood pressure elevations might be due to the stress and fear of operations. Adequate preoperative explanation through proper channels of communication with the patients might minimize the contribution of these factors. Patients with chronic illnesses are at higher risk if they are subjected to the trauma of surgery and general anaesthesia; however, these patients require preoperative optimization of their medical status. Most patients in this study labelled as unfit for general anaesthesia had their operation performed on a later date. Furthermore, most of them were inpatient cases. This

finding might indicate some degree of suboptimal preoperative hospital care for these patients.

Administrative-related reasons accounted for 30.4% of all cancellations, with unavailability of admission beds being the most common reason. All administrative reasons were basically a result of communication problems, which are avoidable. Administrative reasons accounted for 45% of all cancellations in some studies [10,12]. Such problems can be solved by improving the management of patient beds.

In conclusion, although our cancellation rate was low in comparison with the reported rates worldwide, a major reduction in the cancellation rate could be achieved by adopting a few important interventions, such as creating a bed utilization manager position in the hospital. An aesthetic protocol defining the parameters which will render patients as unfit for elective surgery needs to be communicated to surgical specialties and consultants in medical and paediatric departments.

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Management effectiveness initiatives

The management of health care is a pivotal factor in the delivery of effective health service with growing recognition of the key role that non-clinical activities play in the way that health care is delivered. Management effectiveness is crucial in all health care settings: hospitals, primary health care clinics, mobile units, laboratories and pharmacies.

The WHO's Regional Office for the Eastern Mediterranean (EMRO) works in partnership with ministries of health of the Region to strengthen the way in which health care facilities and professionals are managed. The ultimate aim is to improve their functioning by working towards greater effectiveness, efficiency, quality and coverage of services, which will lead to better health outcomes.

The main aspects of EMRO's work within the field of health management involve providing technical assistance and support to countries in the Region to:

- Assess the performance of health services
- Improve the delivery of health care services through capacity-building
- Strengthen district health systems as the viable decentralized entity of the health care delivery system
- Enhance the different lines of accountability and communication between levels of care
- Improve the credibility of health services
- Develop a strategy to find the best balance of public-private mix.