

# Waiting-time to Elective Surgery amongst Patients Attending Mulago National Referral Hospital (Uganda): A Cross-Sectional Study

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## Research Article

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# Abstract

**Background:** Surgical conditions account for 11% of the total worlds' disability-adjusted life years (DALYs). Despite having about 25% of the global surgical burden, the worlds' poor expenditure countries only undertake 3.5% of the total worlds' surgical procedures. In the face of meager healthcare financing in these areas, interventions that enable efficient utilization of the available surgical infrastructure -for instance efficient management of pre-surgery waiting times- offer a first step to mitigating this enormous unmet surgical need. This study therefore set out to determine the waiting times to elective surgery, and factors contributing to surgical delays amongst patients attending Mulago National referral hospital.

**Methods:** This was a cross-sectional study conducted between June and August 2014 on 412 patients scheduled for elective surgery. Mean and median waiting times (WT) to surgery, and reasons for postponement of surgery were determined by retrospective chart reviews and face-to-face interviews, using standardized pre-tested questionnaires.

**Results:** Of the 412 surgeries that had been scheduled, 119 (28.9%) were postponed. Health care system factors which included: lack of theatre space, lack of adequate equipment or sundries, absence of blood for intra and/post-operative blood transfusion, and lack of utilities (water and/electricity), were responsible for most of the rescheduled surgeries. Of all study participants, subjects with Oral and maxillo-facial surgery (OMF), Ear, nose and throat (E.N.T), and Neurosurgery surgical conditions had significantly shorter median waiting-times to surgery (median WT; 3.5 days, 6.5 days & 6.0 days respectively,  $p < 0.0001$ ). Patients whose surgical procedures were curative in nature also had significantly shorter waiting-times (median WT; 8.0 days) compared to patients with diagnostic (median WT; 12.0 days), reconstructive (median WT; 12.0 days) or palliative surgical procedures (median WT; 11.5 days) ( $p = 0.005$ ).

**Conclusions:** Generally, the median waiting-time to surgery amongst participants scheduled for elective surgery in the current study was low, compared to that observed elsewhere. However, the proportion of rescheduled surgeries is still high, with factors intrinsic to operational processes in the surgical health care setting mostly to blame. Additionally, surgical conditions involving the head and neck region, and curative surgical procedures were significantly associated with shorter waiting-times to surgery.

## Background

Surgical conditions account for 11% of the total worlds Disability-adjusted life years (DALYs; a standard measure of disease burden). Africa is responsible for a quarter of this total burden [1, 2], which reflects the acute demand for surgical services across the continent. Most of this need however, is unmet in Sub-Saharan Africa. For instance in 2004, it was estimated that world's poor-expenditure countries (majority of which are in Sub-Saharan Africa) undertook only 3.5% of the 234 million surgical procedures done globally [3]. Chronic shortages of surgical human resources and meager government funding for surgical support services attributed to this low output [4]. Uganda- where about 3.5 million people (10% of the

population) [5] need a surgical consultation- exemplifies this dire human resource need; here only 75 specialist trained general surgeons were available for a population of nearly 30 million people in 2008 [6].

To mitigate this enormous surgical burden, immediate priority should be placed on finding better ways to efficiently utilize the existing infrastructure. One such strategy involves interventions that reduce the waiting time for either emergency or elective surgical operations. Postponing surgery increases the patient's risk to develop complications. Unfortunately, many developing countries lack the data on patient waiting times. The available literature is limited in scope; with studies restricted either to specific surgical diagnoses [7], admission criteria [8], psychosocial aspects (patient perceptions), or patient outcomes [9]. A few studies that had information on why surgery was cancelled, lacked crucial data on how long patients had to wait before surgery was done [10, 11].

This study aims to determine the waiting times to elective surgery for patients attending Mulago National referral hospital (Uganda), and to establish the factors responsible for delays or postponement of surgeries. This knowledge is critical in planning for the existing surgical infrastructure and in forecasting future surgical needs. In developed countries, the tremendous wealth of knowledge on this subject has inspired the creation and adoption of programs, such as the surgical waiting time initiative (SWAT), and the day care surgery program, which have helped shorten patient waiting times and reduce cancellations [12, 13]. The current study provides a wealth of knowledge that would inform development of similar programs in low-income countries.

## Methods

### Study setting and study design

We performed a cross-sectional study between June-August 2014 on 412 patients scheduled for elective surgery at the main operation theatre of Mulago hospital. The hospital has a capacity of 1500 beds, and acts both as a national referral hospital and a teaching hospital, serving 38 million Ugandans, as well as patients referred from neighboring countries. The hospital surgical unit has a total of 18 operating rooms, distributed amongst the different surgical departments [10] (Table 1). Two of these operation rooms are dedicated to emergency surgical operations. Of the remaining operation rooms, 4 are located at the respective surgical departments (E.N.T unit-1, Ophthalmology unit-1, Orthopedic surgery unit-1, and Burns and reconstruction unit-1). The rest of the surgical operation rooms are located in the Main hospital theatre. All elective surgery operations are conducted from the respective operation theatres. In situations when the emergency theatre is overwhelmed, the pending emergency surgeries are transferred to the main theatre. The main hospital operation theatre operates 5 days a week (Monday to Friday) from 9:00 am to 5:00 pm. Approximately 20-30 surgical operations are conducted from the main operation theatre daily. The decision to operate a patient with a surgical condition is made by surgeons at the hospital surgical outpatients clinic. Here, a patient is assessed and assigned a future date when they are to report to the hospital for surgery. The Urgency for the operation is determined by the patients' diagnosis, disease

severity and availability of theatre space. In addition, patients who do not require surgery after presenting to the emergency department are also given a return date for admission for elective surgery at the hospital. Depending on the patients' diagnosis, pre-surgical hospital admission and prepping is done at the respective surgical units (wards). Pre-operative prepping includes clinical and diagnostic assessment of the patient, as well as laboratory workup. When a decision to operate has been made, pre-transfusion blood samples are drawn for grouping and cross-matching of blood for patients for whom the attending surgeon anticipates the use of blood before, during, or after surgery. All the surgical wards except the private section use the main theater and have stipulated operation days. Except for patients admitted to the private section, surgical treatment is free at Mulago hospital. In a few instances however, a patient maybe requested to buy some materials for use during the surgery (e.g. bone fixation plates for orthopedic fractures) in case they are unavailable at the hospital.

### **Study participants**

Out of the 412 study subjects, 237 were admitted for elective surgery via the surgical outpatients' clinic; the rest being admitted through the surgical emergency unit (Table 2). All patients scheduled for elective surgery at the main hospital theatre during the study period were enrolled in to the study. Patients scheduled for elective surgery in other elective operation theatres other than the main hospital operation theatre (e.g. the Obstetric and gynecology theatres, and the satellite operation theatres located on the surgical units) were excluded from the study. Consecutive sampling was used during enrolling of study subjects.

### **Study definitions**

#### **Waiting Time-to-surgery**

We defined time-to-surgery (waiting time-to-surgery) as the duration (in days) from when the diagnosis of the surgical condition was made by the admitting surgeon to the date the surgery was done.

#### **Reason for rescheduling surgery**

When a surgical operation was rescheduled to another day, the primary reason for the delay was determined and classified as: a) patient factors, b) health care provider factors or c) health care facility factors.

Patient factors for rescheduling of surgery included active medical problems such as infection, uncontrolled blood pressure, and cardiac problems like heart failure and arrhythmia. Reschedules due to health care provider factors were either due to a surgeon or anesthesiologist being absent for the operation, or due to inadequate preparation of a patient for surgery. Health care system factors included: lack of theatre space, lack of adequate supplies and equipment to carry out the surgery, lack of utilities, like water and electricity, lack of space (beds) in the intensive care unit, absence of blood for intra-operative or post-operative transfusion, and equipment break down.

## Data collection

Data were collected by retrospective chart review and face-to-face interviews using standardized, pretested forms. For each subject, age, sex, tribe, physical address, occupation, level of education, date of admission, diagnosis, planned surgical procedure, and the scheduled date for the operation were recorded. The patient was also interviewed to ascertain whether surgery was done or not. In the case of cancellation or postponement, a record of the reason was made.

Overall, there were over 150 different surgical diagnoses. During data analysis, these diagnoses were summarized by surgical specialty (detailed in supplementary information) in to; general surgery, orthopedic, neurosurgery, urology, Ear, Nose and Throat (E.N.T) surgery, ophthalmology, paediatric surgery, cardio-thoracic surgery, oral and maxillo-facial surgery, and plastic surgery. For the current study, the purpose of surgery was recorded as curative, diagnostic, reconstructive, or palliative. Written informed consent was sought from each study participant prior to enrollment, and approval to conduct the study was obtained from the Institutional review board of Mulago National referral hospital, and the School of Biomedical Sciences, College of Health Sciences, Makerere University.

## Statistical analysis

We report both the mean $\pm$ SD and median waiting time to surgery for participants in the current study. Descriptive values of categorical variables were computed as frequencies (count and percent). Kruskal-Wallis H test was used for comparison of differences among the categories of factors affecting median waiting time to surgery, followed by post-hoc Dunn's test if the observed difference was statistically significant. An alpha level of 0.05 was used for all statistical tests. PASW (ver. 18) software was used for all statistical computation.

## Results

The response rate of subjects in the current study was 100%. Distributions of categories of demographic features are shown in Table 2. More males than females participated in the study. The average age of study participants was 32.1 $\pm$ 24.4 years. Majority of study subjects were unemployed (48.4%). The study subjects came from different tribal groups spread across the country, even though most of the study subjects were from the Ganda tribe (44.4%). The surgical outpatients clinic was the commonest portal of admission of patients; with majority admitted to the general surgery ward (24%), the neurosurgery ward (19.9%), or the ear, nose and throat (E.N.T) surgery ward (13.1%). For most of the study participants (45.1%), the surgery was intended to cure the underlying pathology. Of the 412 surgeries that had been scheduled, 119 (28.9%) were postponed/rescheduled; with Health care system factors mostly to blame (Table 2).

Participants from the Seventh day Adventist or Jehovahs witness faith (mean 12.14 $\pm$ 30.29 days, median 3.5 days) did not have to wait for surgery as long as Catholics (mean 27.39 $\pm$ 79.45 days, median 12 days), Pentecostals (mean 19.79 $\pm$ 32.63 days, median 12 days),

Protestants (mean  $20.79 \pm 56.32$  days, median 12 days), or Muslims (mean  $49.85 \pm 145.25$  days, median 12 days). This difference in mean and median waiting times was statistically significant ( $p=0.003$ , Kruskal-Wallis H test, post-hoc Dunn's test). Patients with Oral and maxillo-facial surgery, Ear, nose and throat surgery, and Neurosurgery diagnoses had significantly lowest median waiting times, as compared to patients with Urology, Ophthalmology and Cardio-thoracic surgery diagnoses ( $p < 0.0001$ , Kruskal-Wallis H test, post-hoc Dunn's test). Patients whose surgical procedures were curative in nature had significantly shorter median waiting times compared to patients with diagnostic, reconstructive or palliative surgical procedures ( $p=0.005$ , Kruskal-Wallis H test, post-hoc Dunn's test) (Table 3).

Participants gender, tribe, occupation, level of education, point of admission or reason for rescheduling surgery had no significant effects on the median waiting times to surgery.

Most of the rescheduling of surgery was because of problems in the Health care system (Table 4). The differences among the health care system factors, health care provider factors and patient factors were not statistically significant.

## Discussion

We determined the waiting time to surgery and the different factors associated with prolongation or cancellation of surgery among patients scheduled for elective surgery at Mulago hospital. The overall mean waiting time to surgery was  $27.96 \pm 84.55$  days, and the median waiting time was 10 days. Religion, surgical diagnosis, and purpose of surgery were significantly associated with lower median waiting times to elective surgery. Of the 412 surgeries scheduled at the Mulago main hospital theatre between June and August 2014, 119 were rescheduled. Health care system factors were mostly responsible for the rescheduling. Our data therefore front's patients' religious beliefs, surgical diagnosis, or purpose of the surgery as the factors associated with shorter waiting times to surgery. It also suggests that if one intends to reduce surgery delays or cancellations at Mulago hospital main theatre, or other operation theatres in similar settings, they should streamline operational processes in the health care system.

For most surgical conditions, prolongation of surgery leads to increased disease severity and probability of complications (resulting in deterioration of health status, and prolongation of suffering), and death [14-19]. Therefore, if surgery is the best course of action, it is desired that it be done as soon as conditions allow. Because of inadequate resources -in the form of low manpower and poor infrastructure- patients with elective surgical diagnoses are usually put on a waiting list. Waiting lists allow hospitals to optimize use of their facilities, helping to decide an earlier timing of elective surgery for patients with a greater need for surgery before those with a lesser need. Waiting lists are intrinsic to health systems that provide free healthcare to the general population, or those that combine public health insurance with zero or low patient cost-sharing [17].

Mean or median waiting times for elective surgery vary depending on the nature of the surgical diagnosis, the surgical burden in that area, and the healthcare system policies regarding management of waiting lists for that area. A report that examined the influence of waiting time on a patients' decision to buy

private health insurance in Australia reported that most Australians scheduled for elective surgery spend an average of 97 days on the waiting list before the surgery is done [20]. At another hospital in Netherlands, the median waiting time for patients scheduled for either elective surgery on varicose veins, inguinal hernia or gallstones was 170 days, 115 days and 11 days respectively [18]. Surprisingly, patients scheduled for elective surgery in the current study had a rather shorter mean and median waiting duration to elective surgery; 30 days and 10 days respectively. This may probably be due use of less stringent pre-operative admission criteria while scheduling patients for surgery at Mulago hospital, and thus some patients do not have to wait as long before surgery is done. Nonetheless, it could be implied from the above observations that massive healthcare spending and resource availability –intrinsic to healthcare settings of developed countries- are no guarantee to shorter waiting durations for patients [21]. This observation therefore underscores the importance of optimizing use of available resources to streamline existing operational processes.

In the current study, patients from the minority religious sects (advents or Jehovah witnesses), or patients with an oral and maxillofacial, neurosurgery or E.N.T diagnosis, or patients scheduled to have a curative surgical procedure, had significantly shorter median waiting times to surgery. Regarding surgical diagnosis, the common denominator shared by oral and maxillofacial, neurosurgery, and ear,nose and throat conditions, is that they all mostly affect the head and neck region; where mild disease progression could lead to more severe implications on morbidity or mortality. Because of the perceived threat of developing life-threatening complications, it is reasonable to assume that these patients could have been prioritized for surgery. Similarly, curative surgical procedures may also be prioritized for fear of the implications to management and prognosis if the stage of the disease exceeds its surgical curative period. However, we still can't explain why patients from the minority religious sects in our study population had shorter waiting times to elective surgery. It's plausible that this association could have solely arisen by chance.

Our study also found that about 29% of the scheduled surgeries were rescheduled. More than half of the patients were rescheduled due to healthcare system factors which included: lack of theatre space, lack of adequate or proper equipment, lack of sundries, lack of utilities and lack of blood for intra-operative and or post operative transfusion. Our results are consistent with an earlier study which identified shortage of operative space and blood shortage as the top two causes of surgical delays at Mulago hospital [10]. Infrastructure and equipment shortages are a common facet to hospitals in most developing countries [22]. For the case of Mulago hospital, the surgical emergency theatre (which has 2 operation beds) lacks the capacity to handle the surgical load at certain times. Therefore, theatre space that was initially reserved for elective surgeries at the main hospital theatre is reallocated to cater for the spillover surgical emergencies. This inadvertently leads to postponement of the previously scheduled elective surgeries. Healthcare provider factors for example inadequate preoperative prepping of patient, and patient factors (e.g. medical contraindication to surgery), also contributed to delayed surgeries in the current study. However, none of the above reasons were significantly associated with longer waiting times to surgery in the current study.

There are several potential limitations of this study. First, it's possible that our study could have under or over-estimated the waiting time to surgery for some patients in our study population. This applied to participants whose admission documents lacked the exact date of surgical diagnosis. In such instances, the investigators had to rely on verbal recall of the patients, which in some cases is prey to recall bias; especially for participants who had multiple follow-up visits at the surgical clinic before they were admitted for operation at the hospital. Secondly, our study did not examine the determinants of waiting times for all study participants; especially for participants whose surgeries were not rescheduled. However, we were able to identify the reasons for prolongation of waiting-time-to-surgery amongst participants whose surgeries had been rescheduled. Thirdly, we did not report the mean or median waiting times for each individual surgical diagnosis for participants in this study. Instead, we categorized the surgical diagnoses in to their respective specialties for simplicity in reporting. For a more comprehensive understanding of the dynamics of patient waiting times, future studies should examine the determinants of waiting times for patients whose surgeries were not rescheduled or cancelled, and should also compare waiting times for patients attending either district vs regional referral hospitals, or rural vs urban hospitals.

Taken together, the mean and median waiting times to majority of elective surgical procedures for patients at Mulago hospital were shorter than that observed in most developing countries. This could imply that other factors other than resourcefulness of a healthcare setting are more important in determining patient waiting times. Knowing some of the correctable determinants for surgical delays and cancellations would help surgical structures in developing and developed countries to develop strategies that would optimize efficient use of the existing infrastructure

## Conclusions

In summary, overall waiting-time-to surgery for patients in this study was short ( $27.96 \pm 84.55$  days, and 10 days respectively). A patients' surgical diagnosis, religion or purpose for the surgery, were the most important determinants to shorter waiting-time-to surgery in the current study. In addition, almost one-third of the scheduled operations were rescheduled for several reasons. However, in the majority of cases, healthcare system factors were mostly to blame.

The results of our study imply that even amidst challenges of meager resources and infrastructure, patient waiting-time-to surgery can be low. Developing solutions to problems in health care system operations will help remedy the challenges posed by the high cancellations, or postponements of surgery; further reinforcing the gains made by shortening surgery waiting-times.

## List Of Abbreviations

DALYs	Disability-adjusted life years
E.N.T	Ear, nose and throat surgery

OMF	Oral and maxillofacial surgery
S.W.A.T	Surgical waiting time initiative

## Declarations

### Competing interests

The authors declare that they have no competing interests.

### Author's contributions

SK contributed to study conceptualization, data collection, data analysis and manuscript writing. HM contributed to study conceptualization and design, data analysis and manuscript writing. HA contributed to data analysis and manuscript writing. QS contributed to data collection. AET contributed to study conceptualization, and manuscript writing. All authors read and approved the final manuscript

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## Tables

**Table 1:** Operating space per surgical discipline

Surgical discipline	Number of operating rooms
<b>Emergency surgery</b>	
Accident and emergency	2
<b>Elective surgery</b>	
Orthopedics	3
Spine	1
Burns	1
Cardiac surgery	1
Ophthalmology	2
Ear, nose, and throat	2
Maxillofacial	1
Urology	1
Breast and endocrine surgery	1
Hepatobiliary surgery	1
Colorectal	1
Neurosurgery	1
Total	18

**Table 2:** Socio-demographic characteristics of respondents

Variable	Frequency	%
<b>Gender (n=412)</b>		
Male	239	58
Female	173	42
<b>Level of education (n=411)</b>		
No formal education	90	21.8
Primary	173	42
Secondary	100	24.3
Tertiary	48	11.7
<b>Occupation (n=411)</b>		
Unemployed	199	48.4
Formally employed	39	9.5
Not formally employed	173	42.1
<b>Tribe (n=412)</b>		
Acholi	11	2.7
Ganda	183	44.4
Itesot	12	2.9
Kiiga	16	3.9
Lugbara	10	2.4
Soga	20	4.9
Nkole	40	9.7
Tooro	13	3.2
Others	107	26
<b>Religion (n=412)</b>		
Catholic	207	50.2
Muslim	60	14.6
Pentecostal	33	8
Protestant	98	23.8
Others	14	3.4
<b>Point of admission (n=412)</b>		
Surgical emergencies unit	175	42.5
Surgical outpatients clinic	237	57.5
<b>Surgical specialty (n=412)</b>		
Cardio-thoracic surgery	8	1.9
Ear, Nose & Throat surgery	54	13.1
General Surgery	99	24
Neurosurgery	82	19.9
Ophthalmology	34	8.3
Oral & maxillo facial surgery	16	3.9
Orthopedics	22	5.3
Pediatric surgery	42	10.2
Plastic surgery	12	2.9
Urology	43	10.4
<b>Purpose of surgery (n=412)</b>		

Curative	186	45.1
Diagnostic	39	9.5
Reconstructive	121	29.4
Palliative	66	16
<b>Surgery rescheduled (n=412)</b>		
Yes	293	71.1
No	119	28.9
<b>Reasons for rescheduling (n=111)</b>		
Patient factors	16	14.3
Health care provider factors	30	27.7
System factors	65	58

**Table 3: Mean and median waiting times to surgery of the study participants**

Variable	Mean $\pm$ SD (days)	Median* (days)	P Value
Overall	27.96 $\pm$ 84.55	10.0	
<b>Sex</b>			
Male	31.34 $\pm$ 96.14	10.0	0.273
Female	23.30 $\pm$ 65.25	12.0	
<b>Tribe</b>			
Acholi	29.36 $\pm$ 36.48	12.0	0.125
Ganda	35.71 $\pm$ 107.21	10.0	
Itesot	23.50 $\pm$ 23.62	15.0	
Kiiga	10.00 $\pm$ 9.47	8.5	
Lugbara	27.00 $\pm$ 57.65	12.0	
Soga	31.86 $\pm$ 30.09	6.5	
Nkole	11.23 $\pm$ 10.81	4.0	
Tooro	11.54 $\pm$ 15.39	10.0	
Others	26.08 $\pm$ 79.45		
<b>Religion</b>			
Catholic	27.39 $\pm$ 79.45	12.0 <sup>a</sup>	0.003
Muslim	49.85 $\pm$ 145.25	10.0 <sup>a</sup>	
Pentocostal	19.79 $\pm$ 32.63	12.0 <sup>a</sup>	
Protestant	20.79 $\pm$ 56.32	8.0 <sup>a</sup>	
Others (SDA, Jehovah's witness)	12.14 $\pm$ 30.29	3.5 <sup>b</sup>	
<b>Occupation</b>			
Unemployed	28.08 $\pm$ 82.52	9.0	0.499
Formally employed	18.62 $\pm$ 30.27	10.0	
Not formally employed	29.90 $\pm$ 94.96	10.0	
<b>Level of education</b>			
Pre-primary	23.19 $\pm$ 48.99	8.5	0.147
Primary	39.35 $\pm$ 122.29	12.0	
Secondary	13.50 $\pm$ 15.43	10.0	
Tertiary	26.25 $\pm$ 41.93	12,50	
<b>Point of admission</b>			
Surgical emergencies unit	20.63 $\pm$ 71.70	10.0	0.178
Surgical outpatients clinic	33.38 $\pm$ 92.68	11.0	
<b>Specialty of surgical condition</b>			
Cardio-thoracic surgery	15.38 $\pm$ 8,37	15,0 <sup>b</sup>	<0.0001
Ear, Nose & Throat surgery	22.48 $\pm$ 44,91	6,5 <sup>b</sup>	
General surgery	20.84 $\pm$ 52,23	10,0 <sup>b</sup>	
Neurosurgery	8.86 $\pm$ 9,81	6,0 <sup>ac</sup>	
Ophthalmology	46.85 $\pm$ 145.57	12.5 <sup>a</sup>	
Oral & maxillo-facial	6.17 $\pm$ 7,71	3,5	
Orthopedics	15.0 $\pm$ 11,86	13,0 <sup>b</sup>	
Pediatric surgery	51.76 $\pm$ 125,45	12,0 <sup>b</sup>	
Plastic surgery	36.38 $\pm$ 80,50	9.5 <sup>a</sup>	
Urology	49.58 $\pm$ 120,64	19,0 <sup>b</sup>	
<b>Purpose of Surgery</b>			
Curative	25.85 $\pm$ 85,11	8.0 <sup>a</sup>	0.005
Diagnostic	39.54 $\pm$ 117,66	12,0 <sup>b</sup>	
Reconstructive	29.70 $\pm$ 81,91	12,0 <sup>b</sup>	
Palliative	23.88 $\pm$ 61,23	11,5 <sup>b</sup>	
<b>Reasons for rescheduling surgery</b>			
Patient factors	28.08 $\pm$ 82.52	9.0	0.499
Health care provider factors	18.62 $\pm$ 30.27	10.0	
System factors	29.90 $\pm$ 94.96	10.0	

**Table 4: Reasons for rescheduling surgery**

Reason	(n=111) Frequency	Waiting time		p-Value
		Mean±SD	Median	
<b>Patient factors (n=16)</b>				0.501
Pre-op surgery contraindications	13	24.23±29.10	13.0	
Others	3	65.33±10.72	4.0	
<b>Health care provider factors (n=30)</b>				0.670
Anesthesiologist/anesthetist unavailable	5	8.20±4.55	7.00	
Surgeon unavailable	2	20.00±4.24	20.00	
Patient not adequately prepped for surgery	19	19.32±12.10	16.00	
Others	4	29.50±22.95	27.50	
<b>Health care system factors (n=65)</b>				0.644
Lack of theatre space	46	25.30±26.04	15.50	
Lack of adequate equipment or sundries	12	15.92±9.11	13.00	
Lack of utilities (water & electricity)	5	10.40±4.62	12.00	
Others	2	11.00±1.41	11.00	
<b>TOTAL</b>	<b>111</b>			