

# Magnitude and causes of cancelation for elective surgical procedures in Debre Tabor General hospital: A cross-sectional study

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## Abstract

**Objectives:** Elective surgical case cancelation is a common problem and can cause prolonged wait times, harm to patients, and is a waste of scarce resources. Reasons for cancelations are complex and change place to place because they are related to patients, organizational issues, and clinical staff. So, this study is aimed to assess the magnitude and causes of the case cancelation among elective surgical cases in a general hospital.

**Methods:** A cross-sectional prospective study design was conducted on 221 patients scheduled for elective surgery from March 1 to May 30 2019 G.C. All consecutive elective surgical cases scheduled during the study period were included in the study. Data were collected using prepared and pretested questionnaire and entered in the SPSS version 20 for analysis purpose.

**Results:** During the study, 221 patients were scheduled for elective surgical operations, among these 150 (67.9%) patients were operated on the planned date of surgery whereas 71 (32.1%) operations were canceled. The decision for the cancelation was done by the anesthetist due to preoperative coexisting disease findings and inadequate preparation of the patient for the intended operations were 33 (46.5%) followed by administrative-related issues which account 26 (36.6%).

**Conclusion:** Cancelation of elective surgical procedures on the day of surgery was high in this study due to different reasons. Cancelation can be minimized if all the responsible bodies can communicate early regard to the patient.

## Keywords

Elective surgery, cancelations, operation theater

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## Introduction

Cancelation of elective surgical cases is a known health-care quality problem that harms patients and leads to resources wastage and increased healthcare costs. Cancelations may be done due to different reasons which are related to patients, organizational issues, and clinical staff.<sup>1–3</sup> It is a significant problem in many hospitals in that it may lead to dissatisfaction of patients, prolonged patient stay in the hospital, and increased costs. It also reflects inefficiency in the management of the operating theater.<sup>4,5</sup> Cancelations can be done due to avoidable reasons like scheduling errors, shortage of materials, and inadequate preoperative evaluation, and unavoidable reasons like emergency case intervening in the elective schedule, unexpected changes in the patient's medical status, or patient not present.<sup>6,7</sup>

The rate of cancelation among different hospitals ranges from 10% to 40%. Based on different studies, there are many reasons for the cancelation of elective surgical cases, and they differ from hospital to hospital including medical condition changes, patient no show, and scheduling issues.<sup>5,8,9</sup>

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Cancellation of scheduled elective operating lists increases cost, decreases efficiency, increases workload, and wastes operating room time. It also causes significant emotional trauma to the patients as well as their families, and the community in general, and its impact on hospital resources be great due to prolonged hospitalization, and a high cost of healthcare.<sup>6,10,11</sup>

Appropriate resources need to invest in maintaining operating theaters and having surgeons, and theater staffs available on the date of schedule. In spite of this, the cancellation rate of elective surgeries is high, especially in the public sector.<sup>10,12,13</sup>

Identifying of the usual reasons for cancellations can improve theater utilization by permitting responsible bodies to anticipate cases in which problems might arise so that additional attention can be paid to them.<sup>8,10,14</sup> Identification of reasons for elective surgical case cancellation can be able the management body to make appropriate strategies, and thus, make better use of its operation theater facility. So, this research may add to the few available materials and increase the awareness, the sensitivity of the problem to health professionals, and hospital management for better management of the problem at any level. In addition to this, the result of the study might be advantageous to motivate and simulate for more detailed research. Therefore, this prospective cross-sectional study was aimed to assess the magnitude and possible reasons for patient cancellation from scheduled surgical procedures at the intended date of surgery in Debre Tabor General Hospital from March 1 to May 30, 2019.

## Methods

### Setup

An institutional-based prospective cross-sectional study was carried out in Debre Tabor General Hospital on patients who were scheduled for elective surgery from March 1 to May 30, 2019. The hospital is located in South Gondar zone, Amhara regional state, Ethiopia.

### Participants of the study

A total of 221 patients who scheduled for elective surgery were participated by a non-probability consecutive sampling technique within 2 months. All schedules in the study period were included in the study, and they were 221 in number.

## Study variables

### Variables

The dependent variable was case cancellation (yes/no); whereas independent variables include age, sex, planned procedure, and reasons for cancellation like patients related,

medical related, management related, shortage of time, staff related, and incomplete investigation.

### Data collection tool and techniques

The data were collected by two third and two fourth year anesthesia students after adequate training according to the daily schedule lists for elective surgery prospectively. Relevance information from schedules was transferred to the predesigned data collection form. The information obtained was the type of procedures, medical conditions, the status of the procedure whether done or not, and causes of cancellation which were collected until the end of elective procedures. Causes for cancellation which were identified by continuous interviewing the operation theater staffs (nurses, surgeons, or anesthetists) and staffs in the ward on the day of surgery, and immediately recorded in the predesigned form by the data collector. The data collection tool was adapted from the previous literatures done on a similar topic.<sup>4,15,16</sup>

### Data quality assurance

Before actual data collection started pretest was made on nine participants, and some sort of modifications was made based on the response of the pretest. Training was provided for data collectors about the contents of the questionnaires and how to extract data from the responsible bodies. The data collection process was closely monitored by the supervisor and the principal investigator (PI); collected data were checked for any incomplete content by PI daily.

### Data analysis and interpretation

After checking the completeness of the checklist, data were entered into the SPSS version 20 software. A descriptive analysis was done using frequency, percentage, mean value, and standard deviation, and interpreted by the tables.

### Ethical declaration

Ethical clearance was obtained from Debre Tabor University, research and community service coordinator office of College of Health Sciences after the proposal was approved by the Department of Anesthesia with the reference number of CHS/1009/2019. Permission to conduct the research was obtained from the medical director and operation room coordinator of Debre Tabor General Hospital.

## Results

### Demographic characteristics

During the study period, 221 elective surgical cases with a mean age of  $39 \pm 17.5$  were scheduled for operation in different specialties. From these schedules, 116 (52.5%) were female (Table 1).

**Table 1.** Demographic and clinical data of patients who were scheduled for elective surgery at Debre Tabor general hospital from March to May 2019.

Variables	Characteristics	Frequency	Percentage
Sex	Male	105	47.5
	Female	116	52.5
Residency	Urban	103	46.6
	Rural	118	53.4
Specialties	General surgery	98	44.4
	Gynecological/ obstetrical surgery	65	29.4
	Urological procedure	22	9.9
	Pediatrics	13	5.9
	Orthopedics	23	10.4
was the operation done?	Yes	150	67.9
	No	71	32.1

### Magnitude of cancelation

From the scheduled cases, a total of 150 (67.9%) patients were operated on the intended date of surgery whereas 71 (32.1%) patients were canceled. The cancelation distribution among sex shows females has high cancelation rate (37 (52.1%)) than males (34 (47.9%)). But, the difference is not statistically significant at chi-square analysis with the  $p$ -value of 0.94. According to cancelation distribution among the residency, from the canceled cases, most were from the rural area. The difference among the rural and urban patients who were scheduled for surgery was significantly high for rural (Table 3).

### Reasons for cancelation

The cases were canceled due to administrative problems (30 (42.2%)) like unavailability of necessary materials and inadequate preparation of the patients (31 (43.7%)) with the necessary investigations (Table 2).

Distribution of case cancelation among different specialties showed that general surgery was the department with the highest rate of elective surgical cases scheduled 98 (44.4%) from the total schedule and has high cancelation rate from other departments 26 (36.6%) followed by gynecological and obstetric surgeries with the number of schedules 65 and rate of cancelations 21 (29.6%). The least cancelation rate was observed from procedures done on pediatrics age group 5 (7%) (Table 3).

### Decision of cancelation

The decision for cancelation of scheduled elective cases was made by theater personnel alone or in communication with others responsible for the scheduled operation and needs to put the evidence and justification for the cancelations. The most common cancelation decision was made by the anesthetists followed by administrative issues whereas

**Table 2.** Different reasons for patient cancelation among elective operations scheduled in Debre Tabor general hospital, 2019.

Categories	Reasons	Number (%)
Staff related	Lack of operation room staffs	5 (7)
Medical related	Patient not euthyroid	3 (4.2)
	Patient has medical diseases	10 (14.1)
	Needs further investigations	5 (7)
Administrative related	Overloaded schedule	7 (9.9)
	Unavailability of necessary equipments	18 (25.5)
	Blood not prepared	4 (5.6)
	Investigation not done	11 (15.5)
Patient related	Not fasting	1 (1.4)
	Refusal	4 (5.6)
Others		3 (4.2)

**Table 3.** Distribution of elective case cancelation among different specialties and residency of the patient in the hospital, 2019.

Specialty	Scheduled	Canceled (number (%))	
General surgery	98	26 (26.5)	
Gynecological/obstetrical	65	21 (32.3)	
Urological	22	9 (40.9)	
Pediatrics	13	5 (38.4)	
Orthopedic	23	10 (43.5)	
Residency			
Urban	103	29 (28.1)	$p=0.01$
Rural	118	42 (35.6)	

the least number of elective surgical operations' cancelations was decided by the patient themselves (Table 4).

## Discussion

Cancelation of planned elective operations is a significant problem with many unwanted consequences. Cancelations are a major problem on resources, increase costs on the operation, result in operation time wastage, and decrease efficiency. An efficient surgical service should have a low rate of cancelation.<sup>4,5,8</sup> Cancelations also decrease the efficiency of the operation room and increase patients waiting for operation and cost, decrease patient satisfaction, waste medical resources, and undermine the morale of healthcare professionals.<sup>6,10,11,14</sup>

Elective surgical case cancelation rate in this study was 32.1% from the scheduled cases which is high compared to the study done in Tanzania (21%), South Africa (5.6%), Sudan (10.5%), Nigeria (28%), and Jimma University (23%).<sup>4,6,17-19</sup> It is approximately similar with a study done in India (30.3%).<sup>20</sup> Elective surgical case cancelation rate in developing countries ranges from 10% to 40%<sup>6</sup> and developed country 0.21%–26%.<sup>5</sup> This high cancelation rate may be because of the operation theater is on the innovation in the developing country.

**Table 4.** By whom the decision of elective case schedules canceled in a general hospital, 2019.

Cancellation decided by	Cancellation (number (%))
Anesthetist	33 (46.5)
Surgeon	7 (9.9)
Administrative	26 (36.6)
Patient	5 (7)
Total	71 (100)

The cancellation rate distribution among sex in this study was female 37 (52.1%) and male 34 (47.9%) with a ratio of 1.1:1. In another study done in Tanzania, male to female ratio of cancellation was 1.9:1 with 65.8% and 34.2%, respectively.<sup>6</sup>

The reasons for this 32.1% cancellation of scheduled elective cases in this study were administrative-related issues like material shortage, lack of communication (31 (43.7%)), and inadequate patient preparation for the planned procedures (30 (42.3%)). These are similar with almost all of the researches done previously in abroad.

According to the previous study, reasons for cancellation were divided into three categories: patient, hospital, and staff-related issues. Most of the cancellations were due to patient-related issues 72.4%, hospital-related issues 19.8%, and staff-related issues 7.8%. These three most common reasons for cancellation covered a total of 60.3% of all cancellations rates (308/511 cases).<sup>11,21</sup>

The main causes of cancellation in Spanish Hospital were due to broaden category, “medical causes” accounted for 50%, “patient-related causes” for 23%, and “administrative/logistic causes” for 25%.<sup>11</sup> Abbottabad’s hospital cancellation was 25%, and from this, 36% operations were canceled due to insufficient operating time, and 31.6% were canceled due to medical reasons. Shortage of beds resulted in the cancellation of 16.2% operations.<sup>22</sup>

The decision for cancellation of scheduled cases in this study was commonly made by the anesthetist due to preoperative findings and inadequate patient preparation, followed by the administrative-related decisions for the sake of unavailability of sterile materials, investigation-related problems. In Saudi Arabia, cancellation rates due to the surgeons were 34% while patient’s-related cancellations were 32%. The administrative issues contributed to 34% in overall cancellation, and with no anesthetists’-related cancellation.<sup>23</sup> Similar to this study, the decision of the cancellation in Abbottabad was made by the anesthetist in 43% and surgeons in 39% patients and 18% operations were canceled due to organizational reasons.<sup>24</sup>

Cancellation in this study also made due to overload schedule 7 (9.9%) and staff-related issues of unavailability in the operation theater 5 (7%). According to a research done in India showed 30.3% of cancellation rate on the day of surgery; 59.7% were canceled due to lack of availability of operation time; 10.8% were canceled due to medical reasons

of the patient and 16.2% did not turn up on the day of surgery. In 5.4% of patients, the cancellation of surgery was decided by surgeons by changing the plan of surgery; 3.7% were canceled because of administrative reasons, and 4.2% patients were postponed because of miscellaneous reasons.<sup>20</sup> Another study also showed that the reasons for cancellation were untimely appointment (18.5%), over schedule on the date of surgery (16%), the patients thought that they were unfit for surgery (12.2%) and emergencies, and trauma case over-ridden the elective case schedule (9.4%).<sup>24</sup>

The distribution of the cancellation among different specialties in this study was tried to assess and showed, orthopedic surgery was the largest department for cancellation among scheduled orthopedic procedures which is followed by urological, pediatric, gynecological/obstetric, and general surgeries, respectively. According to the study in Finland, the most common surgical specialty for the cancellation was orthopedic (31.8%), followed by gastroenterology (15.2%), otolaryngology (13.6%), and gynecology (11.1%).<sup>22</sup>

Another study revealed that, the highest number of cancellations was done in patients scheduled for major general surgical procedures (94 (20%)), followed by major urological procedures (64 (13%)), major orthopedic surgery (38 (8%)), and ultra-major cardi thoracic surgery (29 (6%)).<sup>25</sup> The highest cancellation among different surgery subspecialties in Saudi Arabia was for general surgery (28%), followed by orthopedic surgery (14.8%), plastic surgery (13.7%), pediatric surgery (13%), gynecology surgery (10.5%), and urology surgery (10%).<sup>26</sup>

According to a study done in Jimma University, from the total number of patients whose operation was canceled, general surgery took the majority of cancellation rate (23%) followed by orthopedic surgery (20%). Common reasons for elective surgical patient cancellation are inappropriate scheduling (33.5%) followed by lack of sterile drape (23.5%) and inappropriate patient preparation (11.8%).<sup>19</sup>

In a study done in Hawasa on 462 patients who scheduled for elective surgical operations; 146 (31.6%) of the operations were canceled. The most common reason for cancellation was due to surgeon-related (35.8%), patient-related (28.7%), management-related (21.2%), and anesthesia-related factors (14.4%). The cancellation was done majorly due to improper scheduling (20.5%), unavailability of surgeons (8.9%), unavailability of oxygen and blood (8%), and equipment (5.5%). The specialty-based distribution showed orthopedic (28.8%) and general surgery (17.1%) were the commonest canceled cases.<sup>15</sup>

## Conclusion

Cancellation rate of scheduled cases on the intended date of surgery was high in the study area. Most of the cancellation was done due to avoidable reasons if done appropriately. The common reasons for these cancellations were administrative-related problems and lack of patient preparation.



## Recommendation

Proper preoperative patient assessment, case scheduling, fulfilling necessary operating room equipment and cross-matched blood, and early clear communication with the operating room team are recommended. Protocols for the preparation of patients for various operations as well as ensuring strict adherence to these protocols to ensure only ready patients are put on definitive theater lists. Planning for the future should be aimed to increase operation theater spaces and equipped with appropriate equipments and manpower. Further investigation for the long effect of cancellation and the fate of the canceled patients is recommended for investigators.

## Limitation

The study was prospective cross-sectional which was done in a short period to address the actual reason for cancellation within a short period. This short period of study contributes for the small size of participants without sample size calculation/power analysis. The other limitation is that the study was done at a single center/institution and could be difficult to infer for other institutions. Therefore, primarily, it will use for inference for this single hospital. This study also failed to assess the long-rank effects of cancellation on the quality of care, the socio-economic conditions of the patient, and the cost of the hospital as we recommend for further investigation.

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## Author contributions

B.C.D. provided conceptualization direction, literature search, synthesis and analysis, and the manuscript write-up. H.Y. and A.A.T read and peer-reviewed the manuscript based on their respective technical knowledge and expertise.

## Data availability statement

The data are available at the hands of the corresponding author and will be shared upon reasonable request.

## Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

## Ethical approval

Ethical approval was obtained from the research and community service coordinator office of Debre Tabor University with the reference number of CHS/1009/2019.

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## Informed consent

Written informed consent was presented and had taken from each study participant. Confidentiality was ensured by removing identifiers and locking the questionnaires after data collection in a secured area.

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## Supplemental material

Supplemental material for this article is available online.

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