ADDIS ABABA UNIVERSITY, COLLEGE OF HEALTH SCIENCE

DEPARTMENT OF ANESTHESIOLOGY

Magnitude and Reasons of Elective Surgery Cancellation Among Patients at Tikur Anbessa Sepecialised Hospital, Addis Ababa, Ethiopia, 2024/25; A Cross-Sectional Study

A Research Proposal to be Submitted to Addis Ababa University, Department of Anesthesiology, Critical Care and Pain Medicine for the Partial Fulfillment of the Requirements of A Specialty Certificate in Anesthesiology, Critical Care and Pain Medicine

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AAU, Ethiopia

Magnitude and Reasons of Elective Surgery Cancellation Among Patients at Tikur Anbessa Sepecialised Hospital, Addis Ababa, Ethiopia, 2024/25; A Cross-Sectional Study

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Abbreviations & Acronyms

AAU	Adiss Ababa University
TASH	Tikur Anbessa Specialized Hospital
OR	Operation Room
ASA	American Society of Anesthesiologists
ACCPM	Anaesthesiology Critical Care and Pain Medicine
ICU	Intensive Care Unit
WHO	World Health Organization
SPSS	Statistical Package for Social Science
BMI	Body Mass Index
IRB	Institutional Review Board
HCP	Health Care Provider
MV	Mechanical Ventilator

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Abstract

Background: Elective surgeries are vital for timely treatment and improved patient quality of life. Cancellation of these surgeries leads to increased costs, delayed treatment, and patient anxiety. Limited data exists on this issue in Ethiopia, particularly at Tikur Anbessa Specialized Hospital, a major referral center. Understanding the magnitude and reasons for cancellations is crucial for improving service delivery.

Objective: To determine the magnitude and reasons for elective surgery cancellations at Tikur Anbessa Specialized Hospital, Addis Ababa,Ethiopia; from Jan1to Jan 31.

Methods: An institution-based, cross-sectional study was conducted using patient medical records. Data was collected via structured questionnaires by ACCPM residents, MSC anesthesia students, and staff anesthetists. Sample size was determined using single population formula.Initially, bivariate analysis was performed to determine the relationship between the outcome and each predictor, and the variables were selected with a P value of less than 0.25 to be considered for multivariable logistic regression analysis. Finally, variables with significant associations were identified based on Adjusted Odds Ratio (AOR), with a 95% confidence interval (CI) and a P-value ≤ 0.05.

Results: A total of 395 patients were included in this study, with a response rate of 98.4%. The overall elective surgery cancellation rate was 15.7% (62 out of 395 patient records). Key reasons for cancellation included Patient-related factors, such as medical illness and patient refusal, account for 27.4% of cancellations. Administrative/management-related factors, including lack of blood and shortage of surgical materials, also contribute significantly to cancellations (27.4%). Time-related factors, such as previous case prolonged and overscheduling, are the leading reasons for cancellations (37.1%). . The multivariable logistic regression analysis revealed that patient refusal, comorbid medical illness, overscheduling, and emergency case priority were factors independently associated with elective surgery cancellation.

Conclusion & Recommendation: A significant proportion of elective surgeries were cancelled. Among the reasons, time-related factors, such as previous case prolonged and overscheduling, are the leading reasons for cancellations (37.1%). ; Addressing patient preparation, resource management, scheduling, and staffing coordination are critical to reducing cancellations and improving patient outcomes at TASH.

Chapter 1: Introduction

1.1 Background

Elective surgeries play a crucial role in the healthcare system, providing patients with the opportunity to address non-emergency medical conditions that may otherwise result in prolonged morbidity or deterioration in quality of life [1, 2]. In an ideal healthcare setting, elective surgical procedures are scheduled and carried out as planned; however, cancellations can significantly impact both patient outcomes and healthcare resources [3]. While the reasons for cancellation are multifaceted, understanding their magnitude and underlying factors is crucial for optimizing surgical care and reducing unnecessary delays.

Previous studies conducted in different contexts have highlighted the impact of patient-related, administrative, and system-related factors on elective surgery cancellations [4]. These factors include, but are not limited to, patient no-shows, inadequate preoperative preparation, resource constraints, and scheduling conflicts [5]. While these studies provide valuable insights, it is essential to explore the specific context of Tikur Anbessa Specialized Hospital to identify the unique challenges and opportunities for improvement. Tikur Anbessa Specialized Hospital, as a leading healthcare institution in Ethiopia, plays a pivotal role in providing surgical services to a vast population. Despite its importance, limited data is available on the extent and causes of elective surgery cancellations within this setting. This dearth of information hinders effective strategies to address the problem and improve surgical care delivery. This study aims to fill the knowledge gap by investigating the magnitude and reasons for elective surgery cancellations at Tikur Anbessa, contributing to improved surgical care delivery through evidence-based interventions.

1.2 Statement of the Problem

Elective surgeries are a cornerstone of modern healthcare, contributing significantly to improved patient outcomes and quality of life. However, the cancellation of these planned procedures is a prevalent issue with substantial implications for patients, healthcare providers, and resource allocation [6]. Despite the importance of elective surgeries, there is a dearth of comprehensive data on the magnitude and reasons for case cancellation in the Ethiopian context, particularly within specialized hospitals such as Tikur Anbessa.

Tikur Anbessa Specialized Hospital, as a leading healthcare institution in Ethiopia, plays a critical role in providing surgical care to a large population. However, the hospital faces challenges in managing the high volume of elective surgeries, including frequent cancellations. These cancellations not only disrupt patient care and satisfaction but also may lead to negative impacts on surgical outcomes; inefficiencies in resource utilization and increased operational costs.

The absence of robust data on the incidence and causes of elective surgery cancellations at Tikur Anbessa Specialized Hospital hinders the development and implementation of targeted interventions to address this problem. Consequently, there is a pressing need to investigate the magnitude of case cancellations and identify the underlying factors contributing to these cancellations. By understanding the problem comprehensively, effective strategies can be developed to reduce cancellations, improve patient satisfaction, and optimize & significantly reduce wastage of resources like operating room, time, staff members and equipment within the hospital's surgical services.

1.3 Justification

The cancellation of planned procedures is a prevalent challenge with far-reaching consequences for patients, healthcare providers, and resource allocation. Understanding the incidence and reasons for elective surgery cancellations is crucial for optimizing surgical care and enhancing patient satisfaction.

Tikur Anbessa Specialized Hospital, a leading healthcare institution in Ethiopia, plays a pivotal role in providing surgical services to a vast population. Despite its importance, there is a paucity of data on the magnitude and causative factors of elective surgery cancellations

within this context. This knowledge gap hinders the development of effective strategies to address the problem and improve surgical care delivery.

The findings from this research was provide valuable insights into the factors contributing to elective surgery cancellations, allowing for the development of targeted interventions to reduce cancellations, improve operational efficiency, and enhance patient experience.

The results of this study was have significant implications for patients, healthcare providers, and the hospital. By identifying the underlying causes of elective surgery cancellations, the hospital can implement evidence-based strategies to optimize resource allocation, reduce waiting times, and improve patient satisfaction. Additionally, the findings can inform the development of patient education programs to empower patients in their preoperative preparation and reduce no-shows.

For healthcare providers, this study was provide valuable information to improve surgical scheduling, allocate resources effectively, and enhance communication with patients. By understanding the reasons for cancellations, the hospital can implement targeted interventions to address systemic issues and improve overall operational efficiency.

Furthermore, the findings of this study was contribute to the body of knowledge on elective surgery cancellations in Ethiopia. By providing evidence-based data, this research can inform the development of national guidelines and policies aimed at reducing cancellations and improving surgical care delivery across the country.

Ultimately, this study was contribute to the improvement of surgical care in Ethiopia by providing essential data and insights. By addressing the issue of elective surgery cancellations, this study has the potential to significantly impact patient outcomes, healthcare resource utilization, and the overall reputation of Tikur Anbessa Specialized Hospital as a center of excellence for surgical care.

1.4 Objectives

1.4.1 General Objective

To determine the magnitude and causes for case cancellation among patients scheduled for elective surgeries at Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia from Jan 1 to Jan 31 2025.

1.4.2 Specific Objectives

- To determine the magnitude of elective surgical cases cancelled at Tikur Anbessa Specialized Hospital from Jan 1 to Jan 31 2025.
- To identify the various reasons for elective surgery cancellations at Tikur Anbessa Specialized Hospital from Jan 1 to Jan 31 2025.

Chapter 2: Literature Review

2.1 Introduction

Elective surgeries are critical components of modern healthcare systems, allowing patients to receive essential medical interventions that improve quality of life and alleviate health issues. However, cancellations of these scheduled procedures pose significant challenges. This literature review explores the magnitude and reasons for elective surgery cancellations, with a focus on findings relevant to the Ethiopian context, specifically Tikur Anbessa Specialized Hospital in Addis Ababa.

2.2 Magnitude of Elective Surgery Cancellations

The magnitude of elective surgery cancellations varies significantly across different studies, ranging from 0.9% to 50%. In Wolaita Zone Hospital, South Ethiopia, a cancellation rate of 22.4% was reported, with factors such as rural residence and lack of lab results contributing to this high rate [7]. In contrast, a study from Harari Regional State, Ethiopia, found an even higher cancellation rate of 35.2%, with female gender and lack of formal education being significant factors [8].A cross-sectional study done at TASH in 2019 showed that the cancellation rate was 33.9%[1].A prospective observational study done in 2012 in Kenya showed cancellation rate of 20.6% with lack of operating theatre being the most common cause [9].In Nigeria a retrospective study done in 2017,the prevalence of cancellation was 9.1% [10]. A tertiary care hospital in India reported a lower cancellation rate of 4.3%, with most cancellations occurring within 24 hours of the surgery [11]. In Australia, a retrospective study indicated a substantial cancellation rate of 50%, primarily due to medication mismanagement [12]. Lastly, a prospective study in a tertiary center in Turkey found a cancellation rate of only 0.9% occurring in the operating room, highlighting the importance of preoperative assessments [13]. These findings underscore the multifactorial nature of elective surgery cancellations and the need for targeted interventions to reduce them.

2.3 Reasons for Elective Surgery Cancellations

Elective surgery cancellations occur for various reasons, significantly impacting healthcare systems and patients. A cross-sectional study done at TASH in 2019 showed that the .The most frequent reasons for cancellation were shortage of time (42.5%) & management related factors (lack of ICU bed, shortage of surgical materials, lack of oxygen and blood) which accounts for 23.2% [1] A study in pediatric surgery identified that medical and anesthesia-related issues accounted for 62.5% of cancellations, with upper respiratory tract infections (36.6%) and abnormal blood test results (16%) being the most common causes [14]. In a broader context, a retrospective study in Iran found that patient unsuitability for surgery (37%) and non-compliance with preoperative instructions (10%) were major contributors to cancellations [15]. Additionally, medication mismanagement was responsible for 1% of cancellations, highlighting the importance of preoperative medication optimization [12]. Cancellations occurring in the operating room were often linked to patient age and health status, with 59.7% deemed potentially avoidable [13]. These findings suggest that improving preoperative assessments, patient education, and communication can significantly reduce cancellation rates across various surgical settings.

The identified factors contributing to elective surgery cancellations can be categorized in to: patient-related, administrative, and system-related factors.

2.3.1 Patient-Related Factors

Patient-related factors, such as medical emergencies, comorbidities, and patient no-shows, have been consistently linked to elective surgery cancellations [16]. Inadequate preoperative assessment and preparation, including incomplete diagnostic tests or failure to adhere to preoperative guidelines, can also lead to cancellations. Moreover, patient factors like age, socioeconomic status, and geographic location may influence cancellation rates [17].

2.3.2 Administrative Factors

Inefficient scheduling practices, resource constraints, and inadequate communication between healthcare providers have been identified as significant contributors to elective surgery cancellations. Overbooking of operating rooms, equipment malfunctions, and staff shortages can also disrupt surgical schedules and lead to cancellations [7]. Additionally, administrative errors, such as incorrect patient information or missing documentation, can contribute to the problem [18].

2.3.3 System-Related Factors

System-related factors, including emergency case prioritization, natural disasters, and healthcare system capacity, can impact elective surgery cancellations. The integration of electronic health records and the implementation of standardized preoperative assessment protocols have been explored as potential strategies to reduce cancellations [19].

2.4 Conclusion

The cancellation of elective surgeries is a complex issue with multiple contributing factors. While previous research has identified various patient, administrative, and system-related determinants, there is a clear need for further investigation in the Ethiopian context, particularly within specialized hospitals like Tikur Anbessa. By addressing the research gap and focusing on specific surgical specialties, this study aims to contribute to the development of effective strategies to reduce elective surgery cancellations and improve surgical care delivery.

2.5 Conceptual Framework

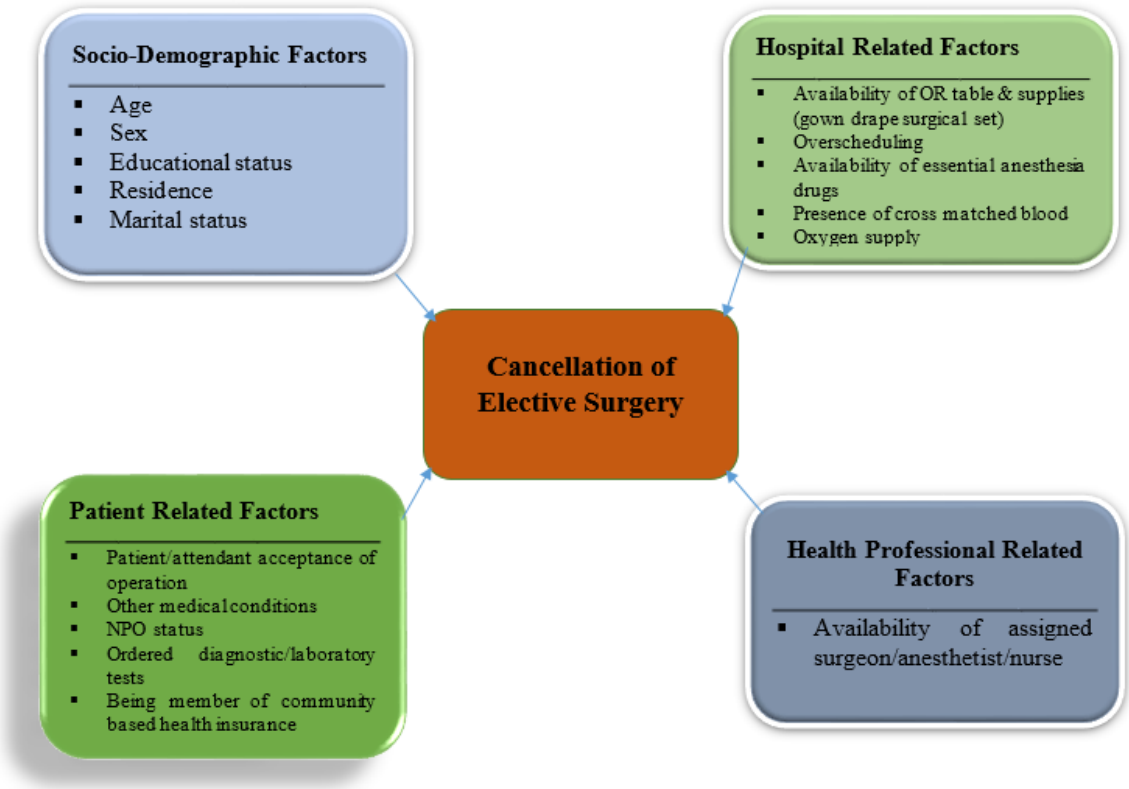

Figure 1: Conceptual framework designed after reviewing literatures on magnitude and reasons of case cancellation among elective surgeries at TASH Adiss Ababa Ethiopia.

Chapter 3: Methods

3.1 Study Design

A cross-sectional study design was employed to assess the magnitude and reasons for case cancellation among patients scheduled for elective surgeries at Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia from Jan 1 to Jan 31 2025. This design allows for the collection of data on a specific population at a single point in time.It also allows for a snapshot view of cancellations and their causes without the need for long-term follow-up.

3.2 Study Area

The study was conducted at Tikur Anbessa Specialized Hospital, a tertiary referral hospital in Addis Ababa, Ethiopia. The hospital provides a wide range of surgical services with 10 different surgical specialities and >11 operating rooms. There are more than 120 beds in wards dedicated to surgical patients; which account 24% of total beds.In general TASH offers diagnosis and treatment for approximately 370,000 to 400,000 patients per year.

3.3 Population

3.3.1 Source Population

The source population for this study comprises all (both adult & paediatric) patients scheduled for elective surgeries of all elective tables at Tikur Anbessa Specialized Hospital during the study period.

3.3.2 Study Population

The study population were those patients scheduled for elective surgery during the study period and who fulfilled the inclusion criteria.

3.4 Inclusion and Exclusion Criteria

3.4.1 Inclusion Criteria

- Patients of all age groups scheduled for elective surgeries from all surgical specialities at Tikur Anbessa Specialized Hospital.
- Patients or guardians who consented to participate in the study.

3.4.2 Exclusion Criteria

- Patients with emergency surgical needs or those whose surgeries are transitioned to emergency status.
- Patients scheduled as 'tentative'
- Patients who did not give consent.
- Patients with incomplete data to answer specific questions on questionnaire

3.5 Sample Size Determination

3.5.1 Sample Size Determination

The sample size is determined by using single population proportion formula with the following assumption.

In a previous study done at Tikur Anbessa Specialized Hospital in 2019, the prevalence of elective surgical case cancellation was 33.9% [1] with Confidence interval of 95%, a margin of error of 5%;

$$Sample\ size\ n = \frac{\left[\left(z_{\alpha/2}\right)^2 \times p(1-p)\right]}{d^2}$$

Where: -

Z= Standard normal distribution value at 95% CI= (1.96)2

p= incidence of cancellation; 33.9% (0.339)

d= margin of error (0.05)

n= sample size

Therefore, n= $[(1.96)^2)\times(0.339)\times(1\text{-}0.339)]/(0.05)^2$= 344

Adding another 5% for non-respondents, making total sample size N=361

3.5.2 Sampling Technique

A consecutive sampling technique was used to enrol patients from the study population.

3.6 Study Variables

3.6.1 Dependent Variable

Case cancellation (yes/no)

3.6.2 Independent Variables

Socio-demographic characteristics

- Age
- Sex
- Residence

Patient Related Factors

- Patient/attendant acceptance of operation
- Other medical conditions/illness
- Comorbidities
- NPO status
- Ordered diagnostic/laboratory tests
- Being present on day of surgery

Health Professional Related Factors

- Availability of assigned surgeon/anaesthetisa provider/nurse

Time Related Factors

- Overscheduling
- Emergency case priority
- Prolonged case

Hospital Administration Related Factors

- Availability of OR table & supplies (gown, drape, surgical materials)
- Availability of ICU bed/MV
- Presence of cross matched blood
- Oxygen supply

3.7 Operational Definitions

Elective Surgery: A surgical procedure that is scheduled in advance and is not urgent in nature.

Cancellation: A situation in which a scheduled elective surgery is not performed on the planned date for any reason.

Magnitude of Cancellation: A percentage of total scheduled surgeries that were cancelled.

Overscheduling: Having too many planned surgeries leading to overly packed schedule

3.8 Data Collection Tools

Data collection tools include a structured patient questionnaire which was filled by, an interview of patients, and a data extraction form medical record review. The tools was developed based on a comprehensive literature review and pilot-tested to ensure reliability and validity.

Structured Questionnaire: To gather structured data directly from patients who underwent elective surgeries.It was contain patient demographics & possible reasons for cancellation.

Patient Records Review: Medical records of both cancelled and completed elective surgeries was reviewed to extract relevant information, including patient demographics, surgical procedure, reason for cancellation, and preoperative assessments.

Patient Interviews: A structured questionnaire was administered to patients who underwent elective surgeries to gather information on any factors that may have influenced the cancellation.

3.9 Data Quality Assurance

To ensure data quality, the instruments was pre-tested on a small sample of patients prior to the full study. Feedback from pre-testing was used to refine the questionnaire. Regular monitoring was conducted during data collection, and data was double-checked for accuracy.

3.10 Data Entry & Analysis

All data was entered and cleaned using SPSS version 26. Thorough data cleaning was conducted to identify and address any missing values, or inconsistencies in the dataset.Descriptive statistics was used to summarize the data, including frequencies, percentages, and means. Inferential statistics was employed to assess the association between variables and to predictors of elective surgery cancellations. Binary logistic regression model was employed to identify factors associated with elective surgery cancellation. Initially, bivariate logistic regression analysis was performed to determine the relationship between the

elective surgery cancellation and each predictor, and the variables was selected with a -pvalue of less than 0.25 to be considered for multivariable logistic regression analysis. Finally, variables with significant associations was identified based on Adjusted Odds Ratio (AOR), with a 95% confidence interval (CI) and a P-value ≤ 0.05.

3.11 Ethical Considerations

Ethical approval was obtained from the Department of Anesthesiology Critical care and pain medicine of Tikur Anbessa Specialized Hospital before data collection begins. Informed consent was obtained from participating patients after providing participants with clear and comprehensive information about the study's purpose, procedures, risks, and benefits and ensuring participants understand their right to withdraw from the study at any point without any consequences.. Data confidentiality was maintained and participant anonymity was ensured by assigning unique identification numbers to participants instead of using personal identification; storing data securely and limiting access to authorized personnel only..

Chapter 4: Results

4.1 Socio-Demographic Characteristics of the Respondents

The socio-demographic characteristics of the study population are presented in Table 1. A total of 395 patients were enrolled in this study, with a response rate of 98.4%. The majority of the participants (78.7%) were between the ages of 18 and 64, while 16.5% were less than or equal to 18 years old, and 4.8% were greater than 64 years old. The gender distribution was relatively balanced, with females comprising slightly more than half of the study population (50.9%) and males making up the remaining 49.1%. Regarding residence, the majority of the patients (57.7%) resided in Addis Ababa. However, a substantial portion (43.0%) came from areas outside Addis Ababa.

Table 1: Socio-demographic characteristics of Patients at Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia (395)

Variables	Frequency (n)	Percentage (%)
Age		
≤ 18 years	65	16.5
18-64 years	311	78.7
> 64 years	19	4.8
Sex		
Female	201	50.9
Male	194	49.1
Residence		
Addis Ababa	228	57.7
Other than Addis Ababa	167	43.0

4.2 Type of Elective Surgery

Orthopedic and urological surgeries constituted the largest proportions, each representing 18.2% of the total cases. Pediatrics (13.7%) and GI/Hepatobiliary (11.1%) surgeries also represented significant portions of the caseload. Cardiothoracic and obstetric surgeries each accounted for 6.8% of the total, followed closely by ENT surgeries at 6.1%. Neurosurgery represented 5.6%, and Gynecology 4.3% of the total surgeries. Endocrine and vascular surgeries were each 3.3% of the total. Maxillofacial surgeries represented a smaller portion at 1.8%. Spine surgeries were the least frequent, representing only 0.8% of the total cases.

Table 2: Distribution of elective surgical procedures performed at Tikur Anbessa Specialized Hospital , Addis Ababa, Ethiopia (395)

Type of Surgery	Frequency (n)	Percentage (%)
Cardiothoracic	27	6.8
Endocrine	13	3.3
ENT	24	6.1
GI/Hepatobiliary	44	11.1
Gynecology	17	4.3
Maxillofacial	7	1.8
Neurosurgery	22	5.6
Obstetric	27	6.8
Orthopedics	72	18.2
Pediatrics	54	13.7
Spine	3	0.8
Urology	72	18.2

Vascular	13	3.3

4.3 Magnitude of Elective Surgery Cancellation

The overall rate of elective surgery cancellation is presented in Figure 1. The results indicate that the magnitude of elective surgery cancellation at Tikur Anbessa Specialized Hospital was 15.7%. This means that out of the 395 patient records reviewed, 62 patients had their scheduled elective surgeries cancelled. Conversely, the majority of patients (84.3%) proceeded with their scheduled surgeries.

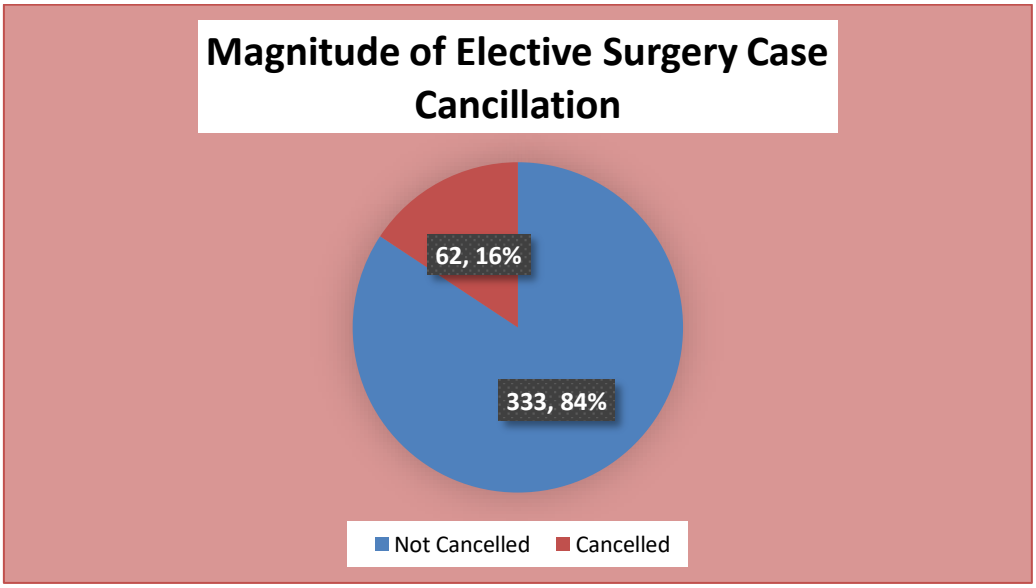

Figure 2: Magnitude of elective surgery cancellation rate at Tikur Anbessa Specialized Hospital , Addis Ababa, Ethiopia (395)

4.4 Reasons for Elective Surgery Cancellation

Patient-related factors, such as medical illness(6.5%) and patient/parents consent refusal(11.3%), account for 27.4% of cancellations. Administrative/management-related factors, including lack of blood(8.1%) and shortage of surgical materials(9.7%), also contribute significantly to cancellations (27.4%). Time-related factors, such as previous case

prolonged(11.3%) and overscheduling(14.5%), are the leading reasons for cancellations (37.1%). Healthcare provider-related factors, including surgeon unavailability(8.1%), account for a smaller but still significant proportion of cancellations (12.9%).

Table 3: Reasons for elective surgery cancellations surgeries at Tikur Anbessa Specialized Hospital , Addis Ababa, Ethiopia (62)

Reasons	**Frequency**	**Percentage**
Patient-Related Factors		
Medical Illness	4	6.5%
Lack of Investigation	3	4.8%
Patient Refusal/Absent	7	11.3%
Not Fasting	3	4.8%
Total	17	27.4%
Administrative/Management-Related Factors		
Lack of ICU Bed	2	3.2%
Lack of Blood	5	8.1%
Lack of Oxygen Supply	4	6.5%
Shortage of Surgical Materials	6	9.7%
Total	17	27.4%
Time-Related Factors		
Previous Case Prolonged	7	11.3%
Emergency Case Priority	7	11.3%
Overscheduling	9	14.5%
Total	23	37.1%
Healthcare Provider (HCP)-Related Factors		
Surgeon Unavailable	5	8.1%
Anesthetist/Anesthesiologist Unavailable	3	4.8%
Scrub Nurse Unavailable	0	0.0%
Total	8	12.9%
Grand Total	**62**	**100.0%**

4.5 Factors Associated with Elective Surgery Cancellation

In the bi-variable logistic regression analysis, which was done using *p* value of 0.25; patient refusal, comorbid medical illness, overscheduling, emergency case priority, and shortage of

surgical materials were factors independently associated with elective surgery cancellation. The multivariable logistic regression analysis revealed that patient refusal, comorbid medical illness, overscheduling, and emergency case priority were factors independently associated with elective surgery cancellation.

Patients who refused surgery or were absent were 4.3 times more likely to have their surgery canceled compared to those who did not refuse or were present (AOR = 4.327, 95% CI: 2.262-8.280, $p < 0.001$). Patients with comorbid medical illnesses were 3.2 times more likely to experience surgery cancellation compared to those without comorbidities (AOR = 3.195, 95% CI: 1.672-6.105, $p < 0.001$). When surgical cases were overscheduled, the likelihood of cancellation increased by 4.1 times compared to when cases were not overscheduled (AOR = 4.063, 95% CI: 2.132-7.744, $p < 0.001$). Surgeries were 2.8 times more likely to be canceled when emergency cases took priority, compared to when they did not (AOR = 2.790, 95% CI: 1.426-5.458, $p = 0.003$). Shortage of surgical materials did not show a statistically significant association with elective surgery cancellation (AOR=1.302, 95% CI: 0.661-2.566, P=0.445)

Bi-variable and multivariable logistic regression analysis factors associated with elective surgery cancellation

Variables	Case Cancellation		COR (95% CI)	AOR (95% CI)	P-value
	No n (%)	Yes n (%)			
Patient refusal					
No	263(79.0)	27(43.5)	1	1	
Yes	70(21.0)	35(56.5)	4.870(2.763-8.587)	4.327(2.262-8.280)	.000
Comorbidity					
No	266(79.9)	31(50.0)	1	1	
Yes	67(21.1)	31(50.0)	3.97(2.25-6.98)	3.195(1.672-6.105)	.000
Over scheduling					

No	273(82.0)	28(45.2)	1	1	
Yes	60(18.0)	34(54.8)	5.52(3.12-2.9.79)	4.063(2.132-7.744)	.000
Emergency case priority					
No	277(83.2)	33(53.2)	1	1	
Yes	56(16.8)	29(46.8)	4.35(2.44-7.73)	2.790(1.426-5.458)	.003
Shortage of surgical materials					
No	251(75.4)	36(58.1)	1	1	
Yes	82(24.6)	26(41.9)	2.21(1.26-3.88)	1.302(.661-2.566)	.445

Chapter 5: Discussion

The current study aimed to determine the magnitude and reasons of elective surgery cancellation among patients at Tikur Anbessa Specialised Hospital, Addis Ababa, Ethiopia. The study found that the overall cancellation rate of elective surgeries was 15.7% (62 out of 395 cases), which is a significant proportion of the total number of scheduled surgeries. The multivariable logistic regression analysis revealed that patient refusal, comorbid medical illness, overscheduling, and emergency case priority were factors independently associated with elective surgery cancellation.

The study revealed that patient refusal and absence on day of surgery were a significant predictors of elective surgery cancellation, with a 4.3-fold increased risk of cancellation compared to patients who did not refuse or were present. This finding emphasizes the importance of patient engagement and adherence to scheduled appointments in minimizing the risk of cancellation. It is essential for healthcare providers to address patient concerns and ensure that patients understand the importance of attending scheduled appointments.

The study also found that patients with comorbid medical illnesses were 3.2 times more likely to experience surgery cancellation compared to those without comorbidities. This finding highlights the need for healthcare providers to carefully evaluate patients with comorbidities and develop effective management plans to minimize the risk of cancellation.

Overscheduling of surgical cases was another significant predictor of elective surgery cancellation, with a 4.1-fold increased risk of cancellation compared to when cases were not overscheduled. This finding suggests that effective scheduling and prioritization of surgical cases are essential to minimize the risk of cancellation.

The study also found that emergency cases taking priority over elective cases was associated with a 2.8-fold increased risk of elective surgery cancellation. This finding highlights the need for healthcare providers to carefully prioritize surgical cases and ensure that emergency cases are handled promptly and efficiently.

The magnitude of elective surgery cancellation at Tikur Anbessa Specialized Hospital (15.7%) falls within the range reported by other studies conducted in Ethiopia. A study involving both Tikur Anbessa Specialized Hospital and Yekatit 12 hospital reported a higher cancellation rate of 24.35% on the day of surgery [20]. This discrepancy could be attributed to the different study periods, the inclusion of another hospital with potentially varying cancellation patterns, or differences in the specific surgical departments or types of elective surgeries analyzed. Furthermore, the definition of 'day of surgery' cancellation might have differed between the two studies. Research focusing on hospitals in the Wolaita Zone, South Ethiopia, found a cancellation rate of 22.4% [7]. This suggests that cancellation rates around the 20% mark are not uncommon in Ethiopian hospitals, indicating a potential systemic issue. Similarly, a study at Wolaita Sodo University Comprehensive Specialized Hospital reported a cancellation rate of 25.5% [18]. The higher rate at another specialized hospital compared to

Tikur Anbessa's 15.7% might point to institution-specific factors such as resource availability or patient management protocols. A systematic review and meta-analysis of elective surgical case cancellation in Ethiopia reported a pooled prevalence of 21.41%, with individual study rates ranging from 8.9% to 33.9% [21]. The 15.7% rate observed at Tikur Anbessa is below this pooled national average, suggesting a potentially better performance than the average Ethiopian hospital, although it still falls within the reported range. Studies in the Harari region, Eastern Ethiopia, reported a cancellation rate of 35.2% [8], further emphasizing the regional variations and the wide spectrum of cancellation rates across the country. The range of 15.23% in Gondar Hospital to 33.9% in Black Lion Hospital has been consistently cited across multiple studies [2], providing a broader understanding of the landscape of elective surgery cancellation in Ethiopia. Notably, a study at St. Paul's Hospital Millennium Medical College in Addis Ababa reported a lower cancellation rate of 8.9% [22]. This indicates that even within the capital city, significant variations can exist between different hospitals, possibly due to the specific patient populations they serve or their resource management strategies. Overall, the magnitude of elective surgery cancellation at Tikur Anbessa appears to be within the lower range reported for specialized or teaching hospitals in Ethiopia, suggesting potentially better performance in this aspect compared to some other major centers.

Compared to other low-resource countries in Africa and Asia, the cancellation rate at Tikur Anbessa (15.7%) presents a mixed picture. Global cancellation rates range from 10% to 40%, with low-income countries experiencing rates as high as 48.5%.[1] The rate at Tikur Anbessa is significantly lower than this upper limit, suggesting the situation might be less severe than in some other resource-limited settings. A study in a rural hospital in South Africa reported a cancellation rate of 14.4% [23], which is remarkably close to the 15.7% found at Tikur Anbessa, indicating similar challenges might be faced in different geographical locations with

comparable resource constraints. However, higher rates have been reported in other African countries, such as 21.9% in Tanzania and 28.5% in Nigeria.[9] These higher figures suggest that Tikur Anbessa might be performing relatively better than some other healthcare facilities on the continent. In comparison with Asia, studies have reported varying cancellation rates, with 27.10% in India and 26% in Oman [24], both higher than the rate at Tikur Anbessa. Conversely, a tertiary care hospital in India reported a lower rate of 9% [11], and a study in Jordan found a very low cancellation rate of 3.6% [25]. These variations highlight the diverse factors influencing surgery cancellation across different low-resource countries and regions. The significantly higher cancellation rates of 44.2% in Malawi and between 23.9% and 28.8% in Uganda [13] further emphasize the variability within Africa and suggest that Tikur Anbessa might be facing less acute systemic challenges compared to these specific contexts. The reasons for these similarities and discrepancies likely stem from a combination of shared challenges related to resource limitations and infrastructural issues, as well as variations in specific economic conditions, healthcare policies, management practices, and the types of hospitals included in the studies.

When compared to high-income countries, the magnitude of elective surgery cancellation at Tikur Anbessa (15.7%) is notably higher. In high-income settings, a permissible cancellation rate is often considered to be less than 10%, with some benchmarks set even lower at 5%.[1] Studies from these well-resourced environments report cancellation rates such as 6.3% [15] and even lower rates of 3.7% and 1.1% following quality improvement interventions.[16] The significant difference underscores the profound impact of resource availability, advanced infrastructure, and optimized healthcare systems in high-income nations on minimizing elective surgery cancellations.

Chapter 6: Conclusion

This study conducted at Tikur Anbessa Specialized Hospital in Addis Ababa, Ethiopia, provides valuable insights into the reasons for elective surgery cancellations. The cancellation rate of 15.7% observed at this hospital is in line with findings from other hospitals in Ethiopia and similar low-resource settings. The reasons for these cancellations were multifactorial and categorized into four main groups: patient-related factors, administrative/management-related factors, time-related factors, and healthcare provider-related factors.

The findings of this study have several implications for the improvement of elective surgery services at Tikur Anbessa Specialised Hospital. Firstly, the hospital should implement strategies to improve patient engagement and adherence to scheduled appointments to minimize the risk of cancellation. Secondly, the hospital should prioritize the preoperative evaluation and management of comorbidities to minimize the risk of cancellation. Thirdly, the hospital should develop effective scheduling and prioritization systems to minimize the risk of overscheduling and cancellation. Finally, the hospital should review its inventory management system to ensure that essential materials are available when needed.

In conclusion, the present study highlights the importance of patient engagement, comorbid medical illnesses, overscheduling, and effective scheduling and prioritization systems in minimizing the risk of elective surgery cancellation. The findings of this study have implications for the improvement of elective surgery services at Tikur Anbessa Specialised Hospital and can inform the development of strategies to improve the quality and efficiency of elective surgery services in other hospitals.

Chapter 7: Recommendations

Based on the findings of this study, the following recommendations are proposed to reduce elective surgery cancellations at Tikur Anbessa Specialized Hospital:

Enhance Patient Education: Implement a comprehensive and culturally sensitive patient education program that focuses on the importance of preoperative instructions, especially fasting requirements. Various communication channels (e.g., brochures, mobile messages, and verbal counseling) should be employed to ensure patients fully understand and follow preoperative instructions.

Strengthen Resource Management: Conduct a thorough assessment of the hospital's resource management systems, focusing on surgical materials, blood, oxygen supply, and ICU bed availability. This can help identify and eliminate bottlenecks in the supply chain, ensuring that essential resources are available when needed for scheduled surgeries.

Optimize Operating Room Scheduling: Review and refine the scheduling practices to minimize overscheduling and better manage surgical time slots. This includes optimizing the estimation of surgery durations and developing better protocols for handling emergency cases that prioritize critical surgeries without causing delays to elective procedures.

Address Staffing Challenges: Evaluate the current staffing levels for surgeons, anesthetists, and scrub nurses to ensure that there are enough trained personnel available. Recruitment and retention strategies should be enhanced, with special emphasis on professional development and task-sharing to maximize team efficiency.

Implement Continuous Monitoring and Evaluation: Establish a continuous monitoring system to track the reasons for surgery cancellations and evaluate the effectiveness of the

implemented interventions. This data should be analyzed regularly to adjust hospital policies and improve surgical service delivery.

CHAPTER 8: Strengths & Limitation

Strength;

To the best of my knowledge there was only one research done at TASH on this topic; so this study will provide further information and encourage others for further study.

The study clearly addressed its main objectives.

Limitations;

The study was cross-sectional and limitations associated with this design may apply. Hence, seasonal variation in magnitudes of surgical case cancellation was not addressed by this study

The study was single centered and the study period was short so it might not represent the annual data.

Tentative schedules were not included, so the total number of elective surgeries done and cancelled during the study period might be different from what the study found.

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10. Declaration

I the undersigned agree to accept all responsibilities for the scientific and ethical conduct of the research project. I provided timely progress reports to my advisor and seek the necessary advice and approval from my advisors in the course of the research.

Name of the investigator: Dr Bekalu Motbaynor (MD, ACCPM R3)

Signature: _____

Date: _____

Approval of the first Advisor:

Name of the advisor: _____

Signature: _____

Date: _____

Approval of the second Advisor:

Name of the advisor: _____

Signature: _____

Date: _____

11. Annexes

11.1 Annex I: Questionnaire

Addis Ababa University college health sciences, school of graduate studies, department of anesthesiology, critical care and pain medicine

Questionnaire prepared to assess magnitude of elective surgical case cancellation & associated reasons

Consent form

Hi, good morning/afternoon.

My name is ----------, I am here on behalf of Dr.Bekalu Motbaynor., a student in Addis Ababa University School of medicine, department of Anesthesiology, critical care and pain medicine. He is conducting a research thesis on "magnitude and reasons of elective surgical case cancellation at TASH, Addis Ababa ETHIOPIA from Jan1 to Jan31 2025 G.C.". He has got formal permission from Addis Ababa University School of Medicine and TASH officials to conduct the study.

You are selected to participate in this study. There was no direct benefit by participating in this study, but in the future information gathered by this study was helps policy makers, programmers and researchers to give appropriate attention on issues of interest and design specific preventive options.

The information was kept confidential by using only code numbers and locking the data. Only the members of the study team was have the access to the non-coded data and the data was not be used for purposes other than the study. Your wasingness and active participation is very important for the success of this study.

If you need any further information or explanation regarding to the study, you can have this address to contact.

Would you be wasing to participate. [put "x'' mark] Yes_____ No_____

Name: Dr. Bekalu Motbaynor Tel- +251-910220860 E-mail: bekalumot@gmail.com

Part I: Questions on socio-demographic characteristics of the patients

1. Card no. _____

2. Age in years _____

3. Sex of participant

1. Male 2. Female

4. Residence A, Adiss Ababa B, Other

5. Comorbid illness

A. yes B. no

7. Type of surgery

A. Orthopedics B. Neurosurgery C. ENT D. GI/Hepatobilliary E. Gynecology F. Thoracic G. Urology H. Endocrine I. Vascular J. Obstetric K. Pediatric M. Other(specify) _____

8. Is the surgery done on the scheduled day

A. Yes B. No

If No; specify and mark the reason..

Part II; Reasons associated with cancellation of elective cases

Table 2. Reasons of case cancellation

Patient related factors	A.Medical Illness B. Lack of investigation C. Patient/parent refusal/absent D. Not fasting E. Other (specify)
Administrative/Management related factors	A. Lack of ICU bed B. Lack of blood C. Lack of oxygen supply D. Shortage of surgical materials E. Other…..
Shortage of time	A. Previous case prolonged B. Emergency case priority C. Overscheduling D. Other…..
HCP related factor	A. Surgeon unavailable B. Anesthetist/Anesthesiologist unavailable C. Scrub nurse unavailable