

AUDIT & ANALYSIS OF CANCELLED ELECTIVE OPERATIONS OF SURGICAL PATIENTS AT MANKWENG HOSPITAL

Lindelani Neo Mukhuba¹ , Mirza Mohamod Zahir Uddin Bhuiyan¹ 

ABSTRACT

Introduction: Cancellation of planned operations on the day of surgery causes psychological trauma for patients and their families. Cancellations have very severe undesirable effects and huge financial consequences for patients and hospitals. The people who suffer most are those of low income, who depend exclusively on the public health sector. This study aims to determine the prevalence of cancellation of elective surgical procedures and to investigate the reasons for cancellation of elective operations, which may increase the awareness of surgeons, theatre team and hospital administration to make possible solutions at Mankweng Hospital. **Method:** A cross-sectional retrospective descriptive study conducted for cancellations of elective surgical operation from February 2022-November 2022. **Result:** Total of 2812 patients booked for elective surgery and 540 operations were cancelled from 5 major departments namely General surgery, Orthopaedics, Paediatric Surgery, Gynaecology, and Plastic surgery. Overall cancellation rate:19.2%. The top reasons for cancellation were prolonged operative time (31.3%), poor preparations (24.6%) and emergencies (22.8%). When correlating with number elective booking and cancelling with each department, the highest number of cancellation rate was found in paediatric surgery (27%) and lowest number of cancellations in Gynaecology (6,9%). **Conclusion:** Many cancellations of the operations could be avoided if proper planning of elective surgical booking were made. It is highly important to improve the quality of surgical service in our healthcare system by reducing cancellation. Surgeons should consider organizing efficient operating time while planning for elective schedule booking in the theatre. Preoperative assessment of the patient by the surgical team is vital before booking the theatre list.

Keywords: *Cancellation of operation; Theatre; Surgeon*

Clin Biomed Res. 2025;45:1-7

¹ University of Limpopo, Limpopo, South Africa.

Corresponding author:

Mirza Mohamod Zahir Uddin Bhuiyan
E-mail: bhuiyanmirza@gmail.com
Department of General Surgery,
Mankweng Academic Hospital,
University of Limpopo
P. Bag X1117, Sovenga 0727
Limpopo, South Africa.

INTRODUCTION

Cancellation of planned operations on the day of surgery causes psychological trauma for patients and their families¹. Cancellations have very severe undesirable effects and huge financial consequences for patients and hospitals². The people who suffer the most are those of low income, who depend exclusively on the public health sector for their basic healthcare service. In addition, cancellation of an operation results in wasted investigations^{3,4}.

Surgical and anaesthetic care should be a fundamental component of the national health system in countries at all levels of development. Five billion people worldwide do not have access to safe, affordable surgical and anaesthetic care when needed, lack of access being worst in low- and middle-income countries (LMICs) and 143 million additional surgical procedures are needed in LMICs each year to save lives and prevent disability⁵. Cancellation of operations will furthermore affect the waiting list while many patients are to come for scheduled surgical operations.

Mankweng Hospital is a tertiary hospital, located 30 km east of Polokwane, the provincial capital in Limpopo Province of South Africa and it has a capacity of 500 beds. It provides mainly tertiary health care services. It is one of the two tertiary hospitals in Limpopo province, which provide 24-hour surgical health care services. The hospital has eight operating theatres catering for all surgical disciplines during the day. There is one theatre in obstetric ward, two in ophthalmology department, one in emergency department and four operating theatres in the main theatre complex. General surgery, Orthopaedic,

Gynaecology, Paediatric surgery and Plastic surgery are the major departments operating in the main theatre complex. There was no dedicated daytime emergency theatre for all surgical disciplines in Mankweng Hospital. Any patient who required emergency operation, elective cases needed to be postponed for serving the emergency patients.

There is paucity of information on the cancellation of elective surgery operation in Mankweng Hospital. This study aims to determine the prevalence of cancellation of elective surgical procedures and to investigate the reasons for cancellation of elective operations. This research finding may increase the awareness of the surgeon and theatre team as well as hospital administration to make possible solutions at Mankweng Hospital.

METHOD

Study design

A cross-sectional retrospective descriptive study conducted for the cancellations of planned elective surgical operation for a period from February 2022 to November 2022.

Study population

All planned booked patients (adults and children) for elective operations from major surgical disciplines at Mankweng main operating theatre complex.

Inclusion criteria

All patients listed on the theatre booking slate of the previous day for elective surgical operations from the major department before the cut-off time of 13h00 at the main operating theatre complex. Major departments included General surgery,

Orthopaedic, Gynaecology, Paediatric surgery, and Plastic surgery.

Exclusion criteria

Excluded those departments not routinely operating in the main theatre (ENT, Neurosurgery, Obstetrics) and maxillofacial department.

Data collection and analysis

A pre-designed data collection sheet was used to collect the information. Data was extracted from the main hospital theatre records. A database was created in Excel for booked and cancelled operations. Data included the department, month, number of elective surgeries booked, number of cancellation and reasons for the cancellation. Categorical data were displayed as frequency and percentage. Excel from Microsoft office 365 was used for data analysis.

RESULTS

A total of 2812 patients booked for elective surgery and 540 operations were cancelled during the study period from 5 major departments namely General surgery, Orthopaedics, Paediatric Surgery, Gynaecology, and Plastic surgery. Overall cancellation rate: 19.2%. Number of cancellations: Orthopaedics 194, Paediatric Surgery 135, General Surgery 109, Plastic surgery 73. and Gynaecology 29. The top reasons for cancellation were prolonged operative time (31.3%), poor preparations (24.6%) and emergencies (22.8%). When correlating the number of elective bookings and cancellations for each department discreetly, the highest number of cancellation rate was found in paediatric surgery (27%) and lowest number of cancellations in Gynaecology (6,9%). Details result in Table 1, 2 and Figure 1 to 5.

Table 1: Reasons of cancellation.

Reason	Number	Percentage
Prolonged operative time	169	31.3%
Poor preparations (blood result deranged, Comorbidity, poor general conditions, patients ate, consent etc.)	133	24.6%
Emergencies	123	22.8%
Operation equipment's failure	28	5.2%
Surgeon not present/Lack of expertise	27	5%
Theatre technical problems (laparoscopy equipment, Anaesthetic machine failure, Theatre temperature high etc.)	18	3.3%
Anaesthetists related	13	2.4%
Procedure postponed	12	2.2%
Operations not indicated	6	1.1%
Procedure done in the ward	4	0.7%
No ICU bed	3	0.6%
Load Shedding	2	0.4%
Theatre blocked by mortality	2	0.4%
Total	540	100%

Table 2: Number of elective operations booked and cancelled in each department.

Department	Elective Booking	Cancelled	Percentage
General Surgery	592	109	18.4%
Gynaecology	419	29	6.9%
Orthopaedics	1009	194	19.2%
Paediatric surgery	500	135	27%
Plastic surgery	292	73	25%
Total	2812	540	100%

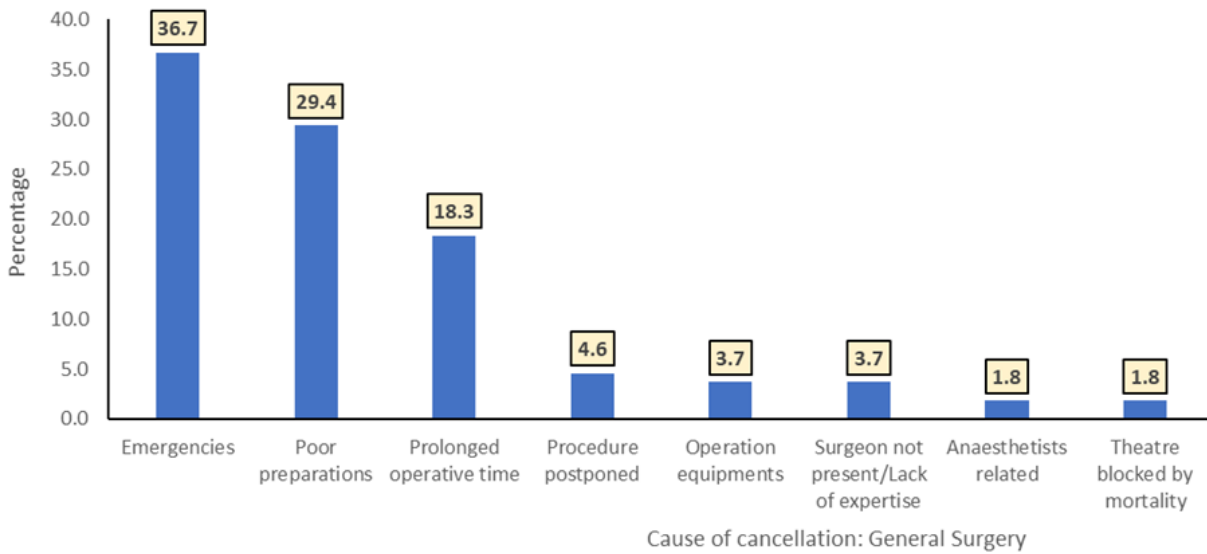


Figure 1: Cause of cancellation in General surgery: Emergency operation booking was the highest for cancellation in general surgery, poor preparation was the second common cause and prolong operating time responsible for 3rd.

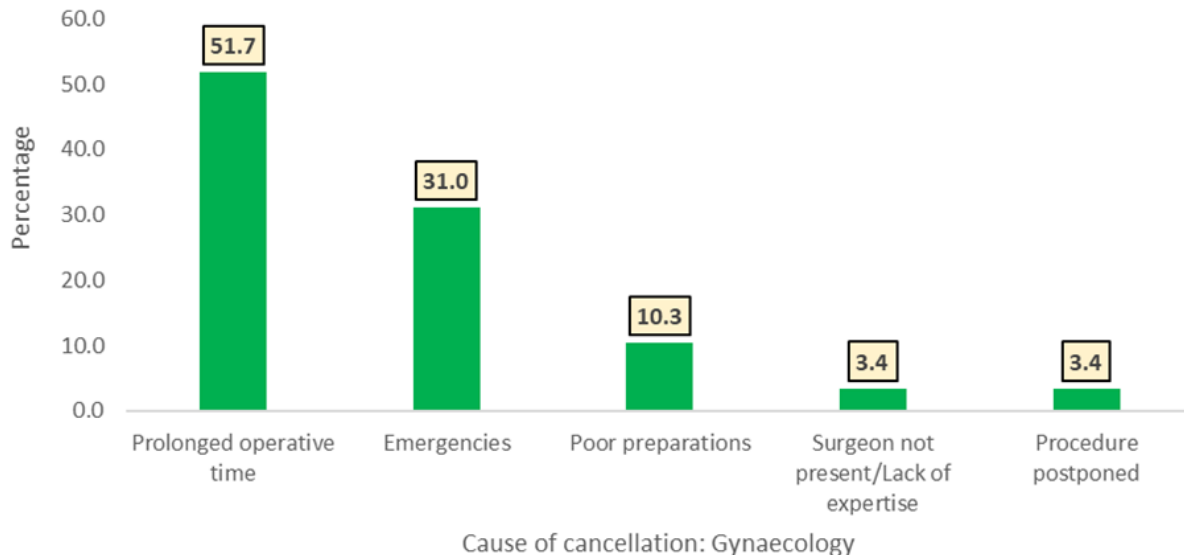


Figure 2: Cause of cancellation in Gynaecology: prolonged operating time is the highest for cancellation in Gynaecology, Emergency operation booking was the second common cause and poor preparation responsible for 3rd.

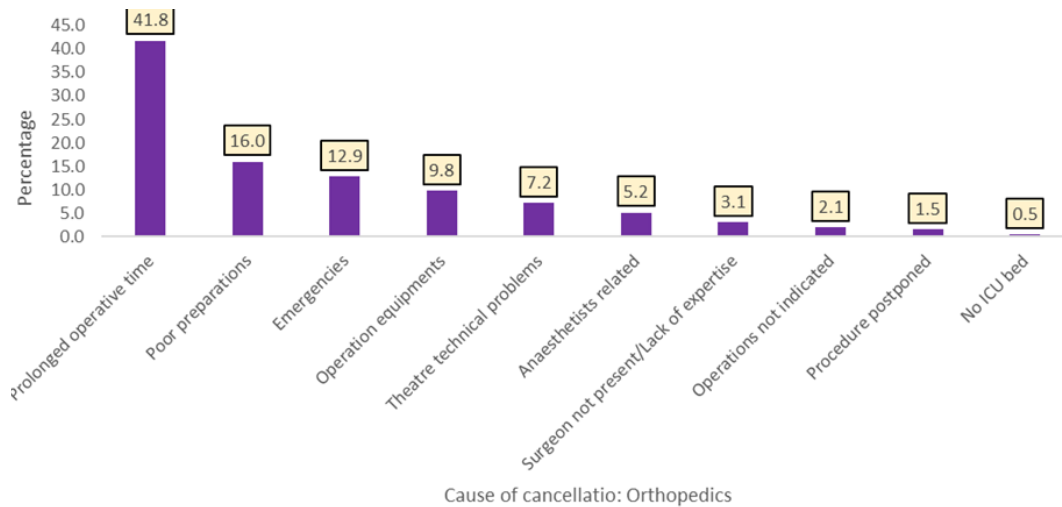


Figure 3: Cause of cancellation in Orthopaedics: prolonged operating time is the highest for cancellation in Orthopaedics, poor preparation was the second common cause and Emergency operation booking responsible for 3rd.

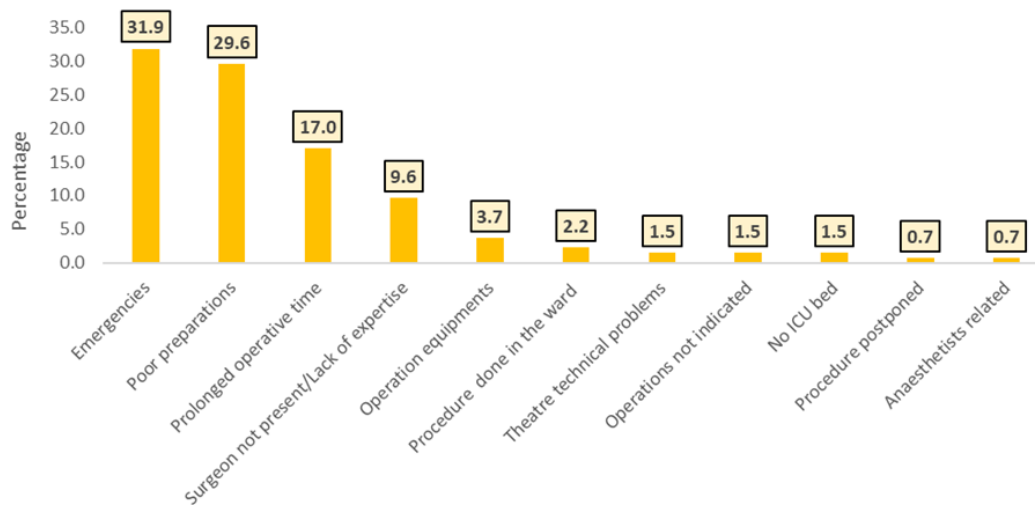


Figure 4: Cause of cancellation in Paediatric surgery: Emergency operation booking is the highest for cancellation in paediatrics surgery, poor preparation was the second common cause and prolong operating time responsible for 3rd.

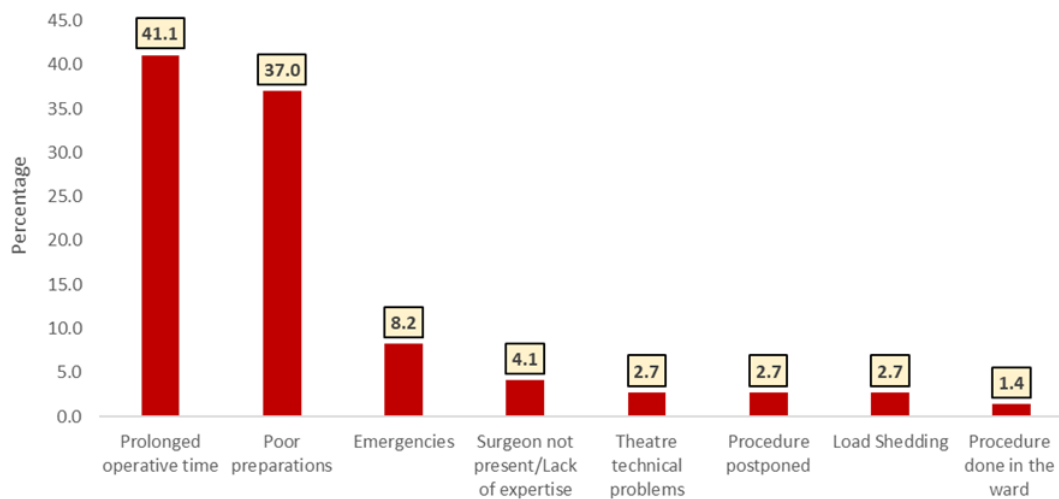


Figure 5: Cause of cancellation in Plastic surgery: prolonged operating time is the highest for cancellation in plastic surgery, poor preparation was the second common cause and Emergency operation booking responsible for 3rd.

DISCUSSION

Overall cancellation rate of elective operations was 19.2% in this study and the top reasons for cancellations of operations were prolonged operative time (31.3%), poor preparations (24.6%) and emergencies (22.8%). These 3 top reasons of cancellation occurred across all the departments with some variations. According to the departmental elective operation list, the highest cancellation rate was found in Paediatric surgery (27%) and lowest cancellation was in the Gynaecology department (6.9%). Over 31% (n=169) patients were cancelled due to prolonged duration of the procedure of elective operations and surgeon did not have time to continue furthermore. The top affected departments were Gynaecology, Plastic surgery, and Orthopaedics. One study from Iran, Naderi-Boldaji et al. stated the second most common reason (10.5%) for cancellation on the day of surgery was lack of time⁶. Another cross-sectional study from in Debre Tabor General hospital in Ethiopia found, higher rates of cancellations on surgery days due to lack of time⁷. Some other studies quoted lack of operating time were responsible for elective surgery cancellation 78%⁸ and unavailability of operation time was 40%⁹. Study from at Nelson Mandela Academic hospital, South Africa found the rate of elective surgical case cancellation fourteen percent¹⁰ and overbooking was 34.2% under the surgical-related factors. Another study from Durban, South Africa, where 41% of cancellations were owing to inadequate operative time¹¹. Underestimation of surgery duration by surgeons was probably responsible for the cancellation as a result of prolonged duration of procedure. Laisi et al. suggested to practise with the software Opera to resolve this issue, which approximates surgery durations using historical data, which estimates time needed for the operation according to duration means of the surgeon's previous similar surgeries¹². Efficient operating time organizing is important whilst planning for elective booking in theatre. Cancellation of planned operations on the day of surgery results in emotional trauma and inconvenience for patients and their families¹. Estimation of the time of procedure and implementation of efficient surgeon scheduling time is a vital factor when preparing operation lists to avoid unnecessary cancellations^{2,11}.

Poor preparation of the patients before surgery was the 2nd common reason for cancelling the operation in this hospital. Poor preparation included deranged blood result, comorbidity, consent, and poor general condition of the patient contributed to 25% of cancellations in this study. Most of this group of patients needed further work-up to improve their condition before surgery. Study from Iran reflected patient's absence, refusal, financial problems, or inadequate preparation before the surgery responsible for cancellations and 37% of their cancellation because of the patient unfit

for operations⁶. J Laisi stated 72.4% of cancellations caused by patient-related issues in a Finnish hospital¹². Fersch MB et al. stated in a study that preoperative anaesthetic assessment is paramount important and substantially reduces cancellation rates¹³. It is vital for the surgical team to assess the patients before booking the theatre list and if it is carried out routinely, the cancellation number can be reduced.

About 23% (n=123) of elective operations were cancelled because the theatre was needed for an emergency operation and most affected departments were general surgery, paediatric surgery and Gynaecology. About 37% in general surgery, 32% in paediatric surgery and 31% in Gynaecology cases were cancelled from their elective operation booking list due to emergency procedures. Despite years of trying to acquire an emergency theatre there was no separate theatre dedicated to emergency cases during the daytime. Mankweng hospital was built in 1988¹⁴ and current infrastructure cannot be extended to create space for an emergency theatre in the main theatre complex. Conversely, number of the surgical discipline increased like paediatric surgery, plastic surgery in the last few years. Apart from those departments, Maxillofacial and Neurosurgery departments are operating in the main theatre complex. To accommodate these departments, it was difficult to provide emergency theatre during daytime in the main theatre complex and the practice was to replace the elective operation with the emergency cases whenever it was needed. However, there is another theatre adjacent to emergency department which is underutilized because of shortage of nursing staff. The availability of a fully equipped and readily accessible emergency theatre in daytime is crucial in a hospital setting. This ensures that patients receive timely and optimal care during unforeseen medical emergencies, thereby minimizing theatre cancellations and promoting better health outcomes. Increase health financing and the recruitment of the health workforce in developing countries are important to achieve the targets of Sustainable Development Goal 3 to ensure healthy lives and promote well-being for all at all ages¹⁵.

Cancellation of elective surgical operations is a major concern that is not only disruptive to health personnel and patients but also contributes to the cost of hospital financial budgets. In the United States (US), the value of estimated the average cost of cancelled operation 5,000–8,000 US dollars¹⁶. In a previous study from Pietersburg hospital, Limpopo, South Africa, estimated the cost in South Africa currency in rand (R) of R25 860 per single cancellation². When elective patients could not be operated on, usually discharged the following day. It means a patient stayed at least 3 days in the ward before going home or to a referral hospital. Cost for staying in hospital for one day, which is called patient day equivalent (PDE), is over R5000 for Mankweng

hospital. It means at least R15000 had been spent for one patient who had not been operated on and in the real fact it was a wasted expenditure. Apart from hospital inpatient costs, the health department also spends a substantial amount of funds on transferring patients to and from the referring hospitals. Patients are also directly economically affected because they must travel again and take leave from work¹⁷, which adds to the financial liability of the low-income. Cancellations of scheduled elective operations are a major burden on the health budget, as patients must go through further preoperative clinical investigations when they come back for the rescheduled operation¹⁸. Cancellations have very severe undesirable effects and huge financial consequences for patients and as well for hospitals. This is particularly important in developing countries that face severe budgetary limitations and where resources should therefore be managed with the maximum efficacy².

There are many indicators for the quality of health care service and cancellation of elective operations is one of the parameters to evaluate the quality of health care and the administration system¹⁹. In this study many cancellations could be avoided if proper planning of elective surgical booking were made particularly by considering the anticipation of time needed for the procedure by the surgeon. Secondly, if proper preparation of the patients were adhered by the surgical team before elective surgical booking in theatre. Thirdly and a very important factor in this set up of Mankweng hospital, if there is a provision of readily accessible emergency theatre in daytime, many cancellations could be prevented, and emergency theatre can be easily provided by recruiting some nursing staff for a theatre which is underutilized. This prevention of cancellation could avert emotional trauma of the patients and as well as their family and additionally reduce the financial loss for hospital and patients.

The findings of this study highlight the reasons for cancellations of operations at Mankweng Hospital. The top reasons are identified and need to emphasize the improved emergency preparedness, optimized surgeon scheduling, and standardized patient preparation. Regular monitoring and evaluation of the effectiveness of implemented policies to ensure continuous improvement.

REFERENCES

1. Ayalew TL. Case cancellations and associated factors on the day of surgery in hospitals of Wolaita Zone, South Ethiopia. *BMC Surg.* 2024;24(1):45.
2. Bhuiyan MMZU, Mavhungu R, Machowski A. Provision of an emergency theatre in tertiary hospitals is cost-effective: audit and cost of cancelled planned elective general surgical operations at Pietersburg hospital, Limpopo province, south Africa. *S Afr Med J.* 2017;107(3):239-42.
3. Chiu CH, Lee A, Chiu PT. Cancellation of elective operations on the day of intended surgery in a Hong Kong hospital: Point prevalence and reasons. *Hong Kong Med J.* 2012;18(1):5-10
4. Feleke MG, Chichiabellu TY, Ayalew TL. Magnitude and reasons of surgery cancellation among elective surgical cases in Wolaita Sodo University Comprehensive Specialized Hospital, Southern Ethiopia, 2021. *BMC Surg.* 2022;22(1):1-6.
5. Meara JG, Leather AJM, Hagander L, Alkire BC, Alonso N, Ameh EA, et al. *Global Surgery 2030: Evidence*

Limitations: This study was retrospective. Starting time of elective operation and theatre utilisation not recorded. Supplement information's were not reflected whether the cancelled patients were rescheduled for operation. Financial and patient-centred implications of cancellations of operation is not contemplated.

CONCLUSIONS

The top reasons for cancellations of operations were prolonged operative time, poor preparations and emergencies. Many cancellations of the operations could be avoided if proper planning of elective surgical booking were made. It is highly important to improve the quality of surgical service in our healthcare system by reducing cancellation. Surgeons should consider organizing efficient operating time while planning for elective schedule booking in the theatre. Preoperative assessment of the patient by the surgical team is vital before booking the theatre list. Provision of readily accessible emergency theatre in daytime is paramount important.

CONFLICT OF INTEREST

None declared.

AVAILABILITY OF DATA AND MATERIALS

The data and materials were collected from medical record and are available from the corresponding author upon reasonable request.

FUNDING

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

ACKNOWLEDGEMENT

The author acknowledges Dr Osvaldo Segura Sardiñas, Biostatistician and Family medicine specialist for his contribution for statistical inferences.

- and solutions for achieving health, welfare and economic development. *Lancet*. 2015;386(9993):569-624.
6. Naderi-Boldaji V, Banifatemi M, Zandi R, Eghbal MH, Nematollahi M, Sahmeddini MA. Incidence and root causes of surgery cancellations at an academic medical center in Iran: a retrospective cohort study on 29,978 elective surgical cases. *Patient Saf Surg*. 2023;17:24.
7. Demilew BC, Yisak H, Terefe AA. Magnitude and causes of cancellation for elective surgical procedures in Debre Tabor General hospital: a cross-sectional study. *SAGE Open Med*. 2021;9:20503121211003357.
8. Talati S, Gupta AK, Kumar A, Malhotra SK, Jain A. An analysis of time utilization and cancellations of scheduled cases in the main operation theater complex of a tertiary care teaching institute of North India. *J Postgrad Med*. 2015;61(1):3-8.
9. Farooq N, Mir T. Cancellation of Elective Surgeries in a Tertiary Care Hospital in North India. *Arch Anesth & Crit Care*. 2021;7(4):234-7.
10. Sukwana A, Mrara B, Oladimeji O. Prevalence and Causes of Elective Surgical Cancellations: Findings from a Rural Tertiary Hospital in the Eastern Cape, South Africa. *Healthcare*. 2023;11(2):270.
11. Asmal I, Keerath K, Cronje L. An audit of operating theatre utilisation and day-of-surgery cancellations at a regional hospital in the Durban metropole. *S Afr Med J*. 2019;109:765-70.
12. Laisi J, Tohmo H, Keränen U. Surgery cancellation on the day of surgery in same-day admission in a Finnish hospital. *Scand J Surg*. 2013;102(3):204-8.
13. Fersch MB, Tung A, Sweitzer B, Huo D, Glick DB. Preoperative clinic visits reduce operating room cancellations and delays. *Anesthesiology*. 2005;103(4):855-9.
14. Bhuiyan MMZU, VanAs AB. A brief overview of the past, present, and future of the Department of General Surgery at Pietersburg and Mankweng hospitals in Limpopo Province, South Africa. *S Afr Med J*. 2021;111(11b):1120-1.
15. SDG. Legal guide [Internet]. 2019 [cited 2024 Sep 16]. Available from: https://www.a4id.org/wp-content/uploads/2019/10/SDG-Legal-Guide_Chapter-3_V2.pdf
16. Turunen E, Miettinen M, Setälä L, Vehviläinen-Julkunen K. Financial cost of elective day of surgery cancellations. 2018. *J Hosp Adm*. 2018;7(6).
17. Vinukondaiah K, Ananthakrishnan N, Ravishankar M. Audit of operation theatre utilization in general surgery. *Natl Med J India*. 2000;13(3):118-21.
18. Elrahman AA, Hamza AA, El-Haj MA. Cancellation of elective general surgical operations at the day of intended surgery. *Glob J Hum Soc Sci*. 2014;14(3):39-43
19. Lankoande M, Bonkougou P, Traore S, Kabore R, Ouangre E, Pendeville. Cancellation of elective surgical procedures in the university teaching hospital center, Yalgado Ouedraogo in Burkina Faso: incidence, reasons and proposals for improvement. *SAJAA*. 2016;22(5):140-4.

Received: Feb 2 2025

Accepted: Oct 19 2025