ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCE

SCHOOL OF PUBLIC HEALTH

MAXIMIZE OPERATING ROOM CAPACITY BY INTERVENING AN AVOIDABLE CANCELATION AT ST. PETER SPECIALIZED HOSPITAL.

BY: - SAMUEL ASSEFA

ADVISORS:-

1. BIRHAN TASEW
2. ALEMAYEHU DESALEGN

A CAPSTONE PROJECT REPORT SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES OF ADDIS ABABBA UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTERS OF HOSPITAL AND HEALTH CARE ADMINISTRATION

ADDIS ABEBA, ETHIOPIA

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Declaration

I am hereby to declare, that except for references to other people's work which have been duly acknowledged, this capstone project is my own composition and neither in whole nor in part has this capstone project report been presented for the award of a degree or masters in this university or else.

Principal Investigator:

Name ----------

Signature.....… Date…….

Advisor:

Name----------

Signature.....Date…….

Co-Advisor:

Name ----------

Signature.....… Date…….

Examiner: Name……..

Signature.....… Date…….

Acknowledgement

I would like to give my sincere thanks to my supervisors. I would like to acknowledge the hospital CEO, surgical teams and administrative body of st. peter specialized hospital for their cooperation and help

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Abbreviations and acronyms

CC-case cancellation

CR- cancelation rate

DM-diabetes mellitus

ECG-Electrocardiogram

ICU-intensive care unit

KPI-key performance indicator

OR-Operation Room

PI-principal investigator

PRE OP-pre operative

PFT-Pulmonary function test

RFT-Renal function test

SPSH- St. peter specialized hospital

PSAA-pre- surgical Admission Assessment

PSAP-pre surgical Admission protocol

Abstract

Background: Elective surgical case cancellation refers to any elective surgical case that is booked into the operation theatre list on the day prior to surgery, but is not operated upon as scheduled. Elective surgical case cancellation is common and can have significant adverse effects.

The cancellation of planned surgeries causes prolonged wait times, harm to patients, and is a waste of scarce resources. Reasons for cancellations are complex because they are related to patients, organizational issues, and clinical staff.

Objective: -To Assess the frequency, to identify reasons for cancellation and to intervening potentially avoidable causes of cancellation and observe the impacts of intervention made in St. peter specialized hospital.

Methods: -The study took place at St. peter specialized hospital. This is a pre and post intervention study from February1/2010 to May 30/2010 E.C. All adult patients that underwent elective surgery in operation room with in the study period were including. Total number of cancellations as well as cause of cancellation was noted.

Implementation: The most feasible intervention was addressing reasons of cancellation due to shortage of OR material (Guan, cape, drape).

Result: -At Pre intervention period highly cancellation caused by shortage of surgical material (guan, Cape & drape). Plan was purchased each 100 of OR guan, drape & cape. Now all are ready for work.

Conclusion: Cancellation of surgeries is significant problem in this hospital .Reasons for cancellation identified was four categories. Whereas only one was selected for intervention in these study after taking impact, feasibility, cost effectiveness, time constraints into consideration. The highest present for reasons for cancellation were seen due to shortage of operation room material in pre-intervention period.

Recommendation: As shortage of OR material (guan, cape and drape) which scores high in pre intervention, needs further in depth assessment and also other root causes should be addressed to see the desired changes. OR performance evaluation should be included in routine monitoring and hospitals clinical audit system.

Key word: Avoid cancellation

Chapter-one: Introduction

1.1. Background of organizational description

St. Peter's Specialized Hospital was established in 1953 EC. The hospital is the country's first TB referral hospital. Currently St. Peter is one of the public hospital formerly it was located in two places. The OPD was located in Kolfe sub city while the Sanatorium was located in Entoto. In the 1960s, the hospital was named TB Demonstration and Training Centre and Sanatorium. The hospital started its service with 69 administrative and technical staffs and an annual budget of 88,000 birr.

St. Peter's has been serving the nation as the only tuberculosis hospital for more than four decades. After the EPRDF came into power, the hospital grew from a single disease hospital into multi services health institution.

St. Peter's became the first hospital in the country to receive and care for MDR-TB patients. The hospital has been receiving inpatients and out patients of MDR-TB with and without referral from all over the country and treating them. It was also recognized by the Ministry of Health as Centre of Excellence for MDR-TB the construction for the expansion of the new St. Peter's General Hospital is well underway and on the right track to be completed in this year. Now the 300 million birr budget hospital has been taking good structure.

This construction expansion project of St. Peter's hospital complex is a much needed facility for Addis Ababa and its environs, and even beyond. The building will have room for 300 beds includes 3 operation theatres, 3 ICUs, 2 delivery rooms and much more. Currently, 30 general practitioners have been sent to school for different specialty.

More than 10 paramedics are also working for their MSc in government higher educational institutions. This enhances the quality of the hospital's services over the coming years. Currently St. Peter hospital gives service by 700 medical and administration staff and 52,888,060 birr allocation budget. Also by 2008 evaluation from Addis Ababa hospital by 3 hospital activities take Award from government 3,000,000 birr and certificate. The following information were obtained from 5 years strategic hospital plan documents.

1.2. Background of the problem

Cancellation of elective planned surgical case is a known quality problem in healthcare system That harms patients and wastes resources, leading to increased healthcare costs. Reasons for Cancellations are complex because they are related to patients, organizational issues, and clinical staff (1).

Unexpected surgical cancellations are not uncommon, decrease patient satisfaction, waste medical resources, and undermine the morale of medical personnel. Before seeking a strategy to reduce case cancellation rate, many medical providers and institutes investigate the cancellation rate and understand cancellation reasons. Due to a lack of standard case cancellation definition, and using different study methods , studies in the US (united states)have reported cancellation rates from as low as 0.21% to as high as 26% . Cancellation reasons also vary across studies including medical condition changes, patient no show, and scheduling issues (2).

Cancellation of elective cases is a significant problem in many hospitals in that it may lead to dissatisfaction of patients, increased costs and prolonged patient stay in hospital. It also reflects inefficiency in the management of the operating theatre (3).

Operation Theater is the heart of a hospital requiring considerable human resources and expenditure from hospital budget. However, Operation Theater is underutilized and lies idle at times. Many patients who are called for operation from waiting list are not operated upon. A significant amount of work needs to be undertaken to prepare the patient for a surgical procedure. This includes the patient notes being written on the day of admission, the consultant taking the time to review the notes, operation theater staff ensuring the correct surgical instruments are available, ward staff preparing the ward for the patient, secretarial staff preparing theatre lists, the patient preparing self for admission to hospital, and preparations for postoperative care. Last minute cancellations result in inefficient use of resources, not in the interests of the patient or the hospital, and result in lost capacity (4).

The literature shows reported incidence of cancellation in different hospitals ranges from 10% to 40%. For ex. India 10%, Nigeria 25.5%, jimma university hospital 23%, Tikur Anbesa specialized hospital27.4%. There are many reasons of cancellation of elective surgical cases; and they differ from hospital to hospital. Unexpected operating room cancellations are traditionally divided into avoidable cancellations(e.g., scheduling errors, equipment shortages, and cancellation due to inadequate preoperative evaluation) and unavoidable cancellations (e.g.,

emergency case superseding the elective schedule, unexpected changes in the patient's medical status, or patient nonappearance). The most common factor which has led to cancellation is lack of OR time (5).

Increasing patient satisfaction through efficient practice is an appropriate objective of a healthcare system. A high cancellation rate for elective surgical procedures makes it difficult to accomplish this. Cancellation reduces operating room efficiency and increases costs (6).

However, different definitions of cancellation exist in the international literature. Some authors define ‘cancellation’ as only those procedures that were cancelled on the day on which surgery was scheduled whereas others also include those that were cancelled on the previous day. The Modernization Agency Theatre Program (National Health Service (NHS), UK) appears to define cancellations as those that occur after the patient has been notified of operation date. In definitions used by a number of reports, cancellations are considered to be any operation that appears in the definitive schedule list that ultimately is not performed. Some other study group reasons for cancellation into relatively broad categories, while others simply list causes without grouping them. In yet other studies, the underlying decision to cancel is explored (7).

1.3. STATEMENT OF THE PROBLEM

Elective case cancellation on the planned day of surgery is common problem in hospitals which harms patients and leads to resource wastes that increases health care costs(1).

Cancellation of patients from elective theatre operating lists increases cost, decreases efficiency, duplicates workload and wastes operating room time. Cancellation of elective surgical procedures also causes significantly emotional trauma to the patients as well as their families and the community in general, and its impact on hospital resources is great due to prolonged hospitalization and high cost of health care(4)

Cancellations of surgical procedures can result in inefficient use of hospital resources and loss of hospital income. The most damaging cancellations with regard to inefficient and costly use of medical resources are cancellations that occur after the patient has been prepared for the operating room. Reasons for cancellations vary, depending on the patient population, the type of surgery, and the adequacy of hospital administrative procedures (6).

Cancellation of an elective surgery increases the patient's stay in the hospital and associated inconvenience. It leads to waste of time for the surgeon and other support staff as well as underutilization of operation theatre (7).

Surgery cancellations are undesirable in hospital settings as they increase costs, reduce productivity and efficiency, increase waiting lists, and directly affect the patient. Considerable resources are invested in maintaining operating theatres, and having surgeons and theatre staff available on an agreed schedule. In spite of this, the cancellation rate of elective surgeries is high, especially in the public sector. Cancellations can significantly inconvenience patients and their families. It is also reported that patients may suffer psychological stress, and/or financial hardships. Accordingly, cancellations are stressful and costly, with a high level of emotional involvement before surgery (8).

1.4. **SIGNIFICANCE OF THE STUDY**

The aim of this study is to determine the magnitude and identify the reasons for elective case cancellation. Study on this topic is important and relevant because researches and reviews are inadequate. identification of reasons for elective surgical case cancellation will enable the management body to make appropriate strategies and thus, make better use of its operation theatre facility.

So this research may add to the few available materials and increase the awareness and the sensitivity of the problem to health professionals, hospital managements and ministry of health for better management of the problem at any level. In addition to this, the result of the study will motivate and simulate for more detailed research.

Chapter-two: Objectives

2.1 General objective

To assess magnitude of case cancellation and factors associated with case cancellation among elective surgical cases in St. peter specialized hospital from February 1, 208 to March 30,2018 G.C.

3.2. Specific objectives:

- To determine magnitude of case cancellation among elective surgical cases in St. peter Specialized hospital
- To asses factors associated with elective case cancellation among elective surgical cases in St. peter specialized hospital

Chapter-three:- Root cause analysis

3.1. Collection of information on the causes of the problem

Nearly distributed the KPI (key performance indicator) manual is not strongly mention to measure cancellation. The only thing is written about shortage of blood supply. Monthly not calculated and audit the reason of surgical cancellation to get the real cause of cancelation done a new assessment and data collection for 2 month after brain storming of OR ward staff.

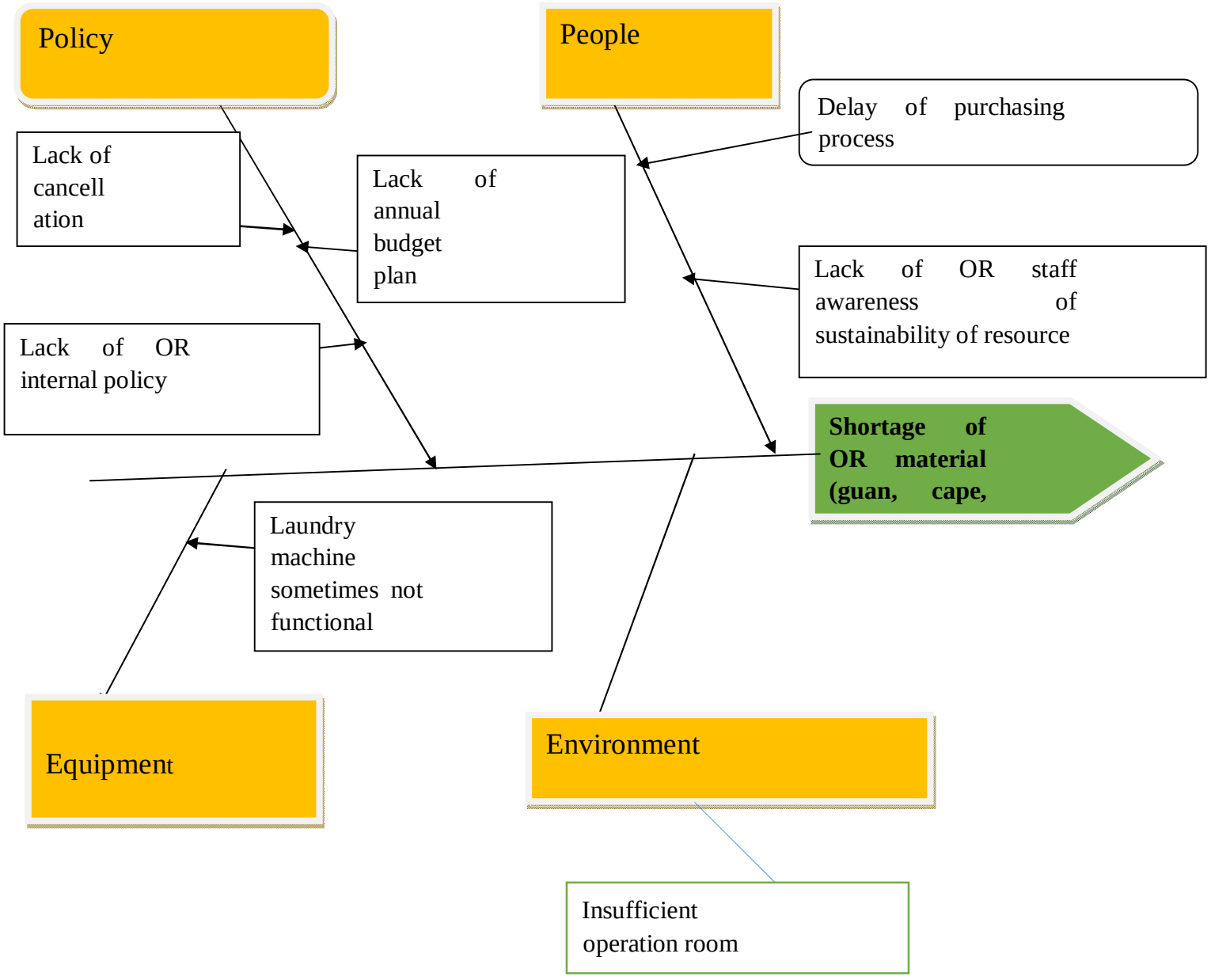
The root causes were with many categories and by using verification of problem method and fish bone diagram. The finding among them were (1) Patients related (2) Medical related (3) Management related (4) Materials Shortage of OR materials (Guan and drape) (5) staff related/ Incomplete of OR staff /related (6) Incomplete investigation.

After analyzing the root Coues interventions were selected using decision matrix based on impact, feasibility, cost effectiveness and time. the chosen reason is <<shortage of OR material (Guan, cape and drape)>>

3.2. Possible root causes

- ✓ Lack of annual budget plan.
- ✓ Lack of cause of surgical cancellation audit in quality office
- ✓ Lack of staff awareness about sustainability of resource.
- ✓ Delay of purchasing process.
- ✓ Laundry machine not functional sometimes properly
- ✓ Insufficient Operation room
- ✓ Lack of OR internal policy

3.3. Verification of possible root causes by fish-bone analysis



3.4 Identified root cause

1 .Lack of staff awareness about sustainability of resource

2. Lack of cancelation Audit by quality office

3. Lack of OR (operation room) purchasing .

Table-6: Magnitude of the real root causes of the problem using decision matrix

No	Real root causes	Impact	Cost	Time	Feasibility	Total
1	Lack of cancellation audit	5	3	3	3	14
2	NO Lack of Purchasing (OR) operation room material	5	4	4	4	17
3	Lack of staff awareness sustainability of resource	4	2	2	3	11

(5 Highest 1 Least)

Chapter-four: Literature review

Operation theatre is one of the important departments that provides sound basis for an effective healthcare framework. It requires considerable human resource as well as budgets as to deliver the best results in an efficient manner. Though, all major hospitals make substantial investment in ensuring the on time availability of surgeons and theatre staff, a major problem that continue prevalent in all hospitals is the cancellation of operation at an eleventh hour. The situation leads to the underutilization and idleness of the operation theatres. A large proportion of hospital budget and human resources are invested in managing a single theater. After admission to the hospital, of elective surgery cancelations mean gross underutilization of these resources. Underutilization of operation room is the subject of developed and developing countries. The study done in India 1590 patients were scheduled for elective surgical procedures in 458 operation rooms during the study period. 47.7% patients were male and rest being females. 28% of the total surgical procedures were planned laparoscopic ally. From 1590,482 (30.3 %) patients were cancelled on the day of surgery. 288 (59.7%) were cancelled due to lack of availability of theatre time; 52 (10.8%) were cancelled because of medical reasons and 78(16.2%) did not turn up on the day of surgery. In 26 (5.4%) patients, surgery was cancelled by surgeons due to a change in the surgical plan; 18(3.7%) were cancelled because of administrative reasons, 20 (4.2%) patients were postponed because of miscellaneous reasons (10). The researches done in Finland from July 1/2009 to June 30/2011, reports a total of 12,205patients were scheduled for surgery, and 551 (4.5%) cases were canceled. Most common surgical specialty was orthopedic (31.8%), followed by gastroenterology (15.2%), ORL (13.6% and gynecology (11.1%) The type of surgical specialty had significant effect on the frequency of cancelations ($p < 0.001$). On the contrary, of 122 scheduled operations for endocrinological surgery, none were canceled. between the two most common types of surgery, orthopedic surgery had more cancelations(5.4%) than gastroenterological surgery (3.8%) (11).Reasons for cancelation were divided into three categories: patient, hospital, and staff-related issues. Most of the cancelations were due to patient-related issues 72.4%, hospital-related issues19.8% and staff-related issues 7.8%. Three most common reasons for cancelation covered 60.3%of all cancelations (308/511 cases). The most common reason was operation no longer being necessary (143 cases, 26% of all cancelations, and 1.2% of all patients). The second most common reason was patient being unfit for operation (86 cases, 15.6% of all cancelations,

0.7% of all patients). Prospective survey was conducted in **UK Royal** Glam organ Hospital over a 12-month period to identify cancelled day case and in-patient elective operations. A dedicated nurse practitioner was employed for this activity. To know the reasons for cancellation and the timing in relation to surgery were identified. The reasons for cancellation were grouped into patient-related reasons. In total, 13,455 operations were undertaken during the research period and 1,916 (14%) cancellations were recorded. The common reasons for cancellation were tiresome appointment (18.5%), list over-running (16%), the patients thought that they were unfit for surgery (12.2%) and emergencies and trauma (9.4 %) (12).One of the study conducted in Hong Kong Hospital on 6234 scheduled cases, 476 were cancelled, which yielded a point prevalence of 7.6%.

The large number of cancellations occurred in patients scheduled for major general surgical procedures (n=94, 20%), major urological procedures (n=64, 13%), major orthopedic surgery (n=38, 8%), and ultra-major cardiothoracic surgery (n=29, 6%). the most common category for cancellation was facility(73%), followed by work-up (17%), patient (10%), and surgeon (1%). not available operating room time due to overrun of the previous surgery was the most common reason for case cancellation (n=310) (13).Study conducted in Saudi Arabia on a total of 2480 scheduled cases to undergo elective surgical procedures. Of those 189 cases were cancelled (7.6%). The highest number of cancellation occurred in the general surgical service (28%) and the least (3.1%) occurred in neuron surgery. There were many reasons recorded for cancellation of surgeries, the most common was the no show up reason (32.5%). The least cause of cancellations was due to improper scheduling and acute illness (0.5%). Among different surgery the highest cancellations sub specialties 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%). The least cancellations were found between vascular surgery and neurosurgery sections (3.7% and 3.1%consequently) (14).Another research done on reasons for cancellation of elective cardiac surgery at Prince Sultan Cardiac Centre, Saudi Arabia, a total number of cardiac surgical patients including pediatric and adult during a period from June 2008 to May 2009 were 2191. Out of those, 1681 cases were done during the study period, 510 (23.27%) cases were cancelled during the study period. The operation theatre was functional for 331 days during the study period. Cancellations done by the surgeons were 34% while the patient's related cancellations were 32%. The administrative issues contributed to 34% in overall cancellation and anesthetists

related cancellation were 0 % (15). Another 52 months prospective studies in Spain on Causes for cancellation of elective surgical procedures in Spanish general hospital 39,115 operations were scheduled in 9733 theatre sessions. There were 2559 cancellations (6.5%). A similar number of women and men underwent surgery (51% vs. 49 %) and the cancellation rate by gender was similar (6% vs. 7%).Cancellations were more common in patients aged 0–10 years (13%, n = 202), followed by those aged 21–30 years (9%, n = 255). Cancellations were less frequent in older age groups (16). The main causes of cancellation by broad category, 'medical causes' accounted for 50%,'patient-related causes' for 23%, and 'administrative/ logistic causes' for 25%. In order, the most frequent specific causes were 'lack of theatre time' 23%, 'patient did not attend' 20% and infection/fever' 18% (the vast majority of these due to respiratory tract infection). together, these three causes alone accounted for 60% of all cancellations (5).In study done in Abbottabad total number of general surgical operations performed form July 2006 to June 2007 was 2820. 3756 patients were scheduled for surgery during this study period. The operation theatre was functional for 285 days during the study period resulting in 9.8 cases per day. 936 (25%) operations were cancelled in the hospital. 338 (36%) operations were cancelled due to insufficient operating time. 296 (31.6%) were cancelled due to medical reasons. Shortage of beds resulted in cancellation of 152(16.2%) operations. The anesthetist cancelled the operations in 399 (43%) and surgeons in 367 (39%) patients. 170(18%) operations were cancelled due to organizational reasons (16).from the total 455 surgical operations booked for surgery during the study period of three months in Pakistan Karachi civil hospital 33 operative days were analyzed, out of them; one day full list cancelled due to law and order situation in the city (strike). The average cases per list scheduled were 14.2 cases. Out of total 455 booked operations, 97 (21%) operations were cancelled. As most of cancelled Patients did not come on the scheduled day of operation for cases under local anesthesia; noncompliance of patient has been identified as the major contributor for operations cancellation followed by lack of operating theatre time.(9)During the period of January - December 2013 In the Kingdom of **Saudi Arabia**, Makkah region, there were total 16211 scheduled surgery cases in 15 different surgical specialties and 1238(7.6%) cases were cancelled. Out of total cancelled cases, Orthopedics' cases were 419(33.9%), general surgery 340(27.5%), obstetrics 95(7.7%), ENT 65(5.2%), ophthalmology 59(4.8%), and others. Total numbers of operative cases cancelled were 1238. There were 27 different reasons for cancellation of the operations, and the causes for cancellations were categorized as patients related, 42.81%, facility related 20.03%, because of improper work-up 9.45%, linked withanesthesia1.45%,

related with surgeons 7.19%. the most common single reason for operation cancellation was failure of the patients to attend 20.76%, followed by from surgeon 6.95%, blood was not arranged 5.57%, because of other medical conditions 5.17%, on patients request 4.77%,for improper scheduling 4.84%, lack of equipment 4.20%and others(17).The study in Sudan including 1724 patients were scheduled for elective surgical procedures during the study period; 106 (6.0%) of these were cancelled on the day of surgery. The causes were coexisting medical problems 38.7%, administrative 25.5%, patient related 18.8%, surgical12.2%, and anesthesia related 2.8%. Out of the medical problems which led to cancellation were commonly: acute cardiac causes 17.9% and acute respiratory causes 9.4%. From the administrative causes 17.9% were due to lack of theatre time. Out of the patient related causes16.9% were because the patient failed to admit. According to the age group cancellations between 61– 70 year age group (31.1%) & 51 – 60 year age group (25.4%). The cancellations of major, intermediate & minor surgeries were 58.5%, 18.9%, 22.6 % respectively (18) The study at Aga **Kahn, Pakistan,** and University shows a total of 810 patients were scheduled to have surgeries in the main operating rooms. In these 810 patients 55 cancellations (6.7%) were noted. Patient related cancellation for 32 (58%) Further break-up of this group showed that 'no-shows' were 40%, patient refusals 3.6%, financial constraints 3.6% and failure to follow preoperative instructions 5.4%. Acute illnesses of the patients were a cause in5.4% of the cancelled cases. Anesthesia related factors accounted for 12 (22%) Cancellations done by surgeons accounted for 10 (18.2%) of the total cancellations. Surgery related factors were unplanned booking (5.45%), patient requiring further surgical workup(3.6%), surgeon busy in emergency surgery (3.6%) and surgeon's non availability due to other reasons (1.8%) (19).From 17,625 patients, in **Swedish** public health care system, scheduled for elective surgery, 6,911(39%) had their procedure cancelled at least once. A quantity of 4,008 (58%) had their procedure cancelled once, 1,935 (28%) twice, 622 (9%) three times, 208 (3%) four times and 138 (2%)more than four times. This adds up to a total number of 9,836 cancellations for the 6,911 actual patients. Of these patients, 2,639 (38%) underwent surgery on a later occasion at the current hospital, while 4,272 (62%) were transferred to other clinics or declined surgery (20).In South Africa a retrospective evaluation was done on why is surgery canceled? Over 12 months, during which 5,786 operations were complete (2,800 urgent and 2,986 elective),cancellations occurred in 333 (5.6%) of cases. The most common reason was lack of medical clearance and patient preparation (65.1%). More decisions for postponement came from surgeons (25.8%) than from anesthetists' (4.5%). Other reasons for postponement of

surgery were: lack or failure of instruments (2.8%), and cancelled by patients (1.8%). No operations were cancelled because of lack of ICU beds (21).10 . The study done in **Tanzania** shows that a total of 3,064 patients were scheduled to undergo elective surgical procedures. Of these, 2,420 (79.0%) patients were operated on while the remaining

644(21%) patients' procedures were cancelled. The ages of patients whose operation were cancelled ranged from 1 month to 86 years. There were 424 (65.8%) males and females were 220 (34.2%) with a male to female ratio of 1.9:1. General surgery had the highest number of patients booked for operation (24.7%) followed by orthopedic surgery in 21.8% of patients. Cardiothoracic surgery and Ophthalmology had the least number with 3.2% and 2.2% of patients booked for operations respectively (4).A research done at El- Oboid Hospital **western Sudan** shows 1633 elective major general surgical operations performed during the study period. 162 cases (9.9%) were cancelled eighty nine patients (55%) were females. The mean age was 46.5 years. The causes of cancellations were34.6% patient related, 32.1% staff related and 33.3% procedural reasons. (5) the study at Khartoum, Sudan 2750 patients were scheduled for general surgical operations, 2460 (89.5%) patients were operated on their planned date. A total of 290 (10.6%) operations were cancelled. The mean age was 41.2 ± 16.5 years, with female to male ratio of1.2:1. There were many reasons for postponement of surgery; the main reasons were categorized into medical related, patient related, administrative, inadequate preparations of patients and other reasons, accounting for 30.3%, 24.9%, 20.3%, 19.5% and 4.6% respectively. The main three causes for cancellation in the study were; failure of the patients to attend, uncontrolled hypertension and overloaded schedule. These were seen in 57 (19.7%), 35 (12.1%) and 32(11.0%) patients respectively. Most of the reasons (76.9%) were potentially avoidable (22).A total of 1015 patients were scheduled at a University Teaching Hospital, Enugu, Nigeria for elective surgery during the study period while 284 (28%) of the patients had their surgery cancelled for various reasons. The two most frequent reasons for cancellation were inadequate theatre time and registered patients not showing up on the day of surgery (21.13%).Miscellaneous (6.69%) causes of cancellation in this audit included patient not fasted, patient menstruate, or no availability of sterile surgical instrument pack. General surgery is the highest number (352) of booked cases and also the highest number, 103 (36.27%) of cancelled11cases. However, pediatric surgery with the 4th largest number (92) of booked cases had the highest (44.57%) cancellation rate. The similar reason for cancellation of elective pediatric surgical cases, was insufficient theatre time while for orthopedic surgery it was failure of patients to show up for registered surgery (23) in the time of study 2750 patients

were scheduled for general surgical operations, 2460 (89.5%)patients were operated on their planned date. A total of 290 (10.6%) operations were cancelled. The average age was 41.2 ± 16.5 years, with female to male ratio of 1.2:1. There were many reasons for rescheduling of surgery; the main reasons were categorized into medical related ,patient related, administrative, inadequate preparations of patients and other reasons, accounting for 30.3%, 24.9%, 20.3%, 19.5% and 4.6% respectively. The major three causes for cancellation in the study were; failure of the patients to attend, uncontrolled hypertension and overloaded schedule. These were seen in 57 (19.7%), 35 (12.1%) and 32 (11.0%) patients respectively. Most of the reasons (76.9%) were potentially avoidable (24). During study done at Jimma University 1438 patients were scheduled to undergo elective surgical procedures and these 1107 (77.0%) patients were operated, while the remaining331(23%) cases were cancelled. From the total number of patents whose operation was cancelled over-all surgery takes the majority 198 (23%) followed by orthopedic surgery 391 (20%).Common reasons for elective surgical patient cancelation is incorrect scheduling (33.5%)followed by lack of sterile drape (23.5%) and in appropriate patient preparation (11.8%) (25)

Chapter-five: Methods and materials

5.1. Study area

This study was conducted in Addis Ababa at st. peter specialized hospital.

5.2. Study design: -

This was a pre and post intervention study.

5.3. Study period: -

Pre –intervention period was March and April 1/ 2010 E.C post intervention was May 30/2010E.C.

5.4. **Population.**

Source population: - Elective surgical cases who are scheduled for elective surgery

5.5. **Study population**: - All patients scheduled for different elective surgical procedures OBS/gynecology, maxillofacial, Neurology during the study time.

5.6. Sampling unit

Each patient booked for elective surgery with in the study period.

5.7.**Inclusion criteria: -** All adults admitted for elective surgery

5.8. **Exclusion criteria:** - all emergency surgery

5.9. Sample size determination

$$n = \frac{(Z\alpha + Z\beta)^2 * [P1(1-p1) + P2(1-P2)]}{(P2-P1)2}$$

Where, n = the required sample size

P1 = the proportion of standard checklists which met a Nursing Care standard practice pre-intervention (before intervention) = 0.10

P2 = the target value of the proportion of standard checklists which met a Nursing Care standard practice post - intervention (after intervention) = 0.05

P2-P1= the magnitude of a change that was a desired to be able to detect = 0.05

1-∝= the level of confidence; (α =0.05, Zα =1.645)

1 - β = the power of the study; (β=0.8; Zβ =0.84)

$$n = \frac{(1.645+0.84)^2 * [0.1(1-0.1) + 0.05(1-0.05)]}{[0.05-0.1]^2} = \mathbf{113}$$

5.10. Sampling procedure

Base line data were collected could be conducted by interviewed of OR staff for relevant information about cause of surgical cancellation, matron and OR head discussion and tally. February and March 2018, and post –intervention period was April and May 2018. information included were all operating theatre elective bookings for surgery from operation list and all cancelled operations were used as a sampling frame consecutive count of all scheduled elective case and all DOS cancellations were included for the pre and for post intervention assessment within the given time period.

All patients record within the time frame were identified and reviewed for pre-surgical/pre anesthetist evaluation format completeness in the pre and post intervention assessment including the age and sex pattern.

5.11. Measures and Data collection procedure

Data were collected with the tools prepared by investigator (see annex)

The OR head nurse were assigned, after conducting orientation demonstration about the format for reason for day of surgery (DOS) cancelation to fill on daily bases from patient's record. The form included schedule and causes of cancellation, age and sex of patient. Operations were recorded from operation list by data collector. The data collector and the supervisor were oriented on the purpose of the study and the data collection tool.

5.12. Data quality management

To get base line data were collected for 2 months February &March 2010 E.C by using of discussion, Tally and observation. Also conducted interview operation room and anesthesia staffs. The Tally paper for the data collection were commented by head OR and matron.

Investigator and the supervisor insured the data quality with close supervision of the data collection process. The data quality was checked against OR schedule list for data completeness and spot check of records were done for consistency by assigned supervisor.

5.13. Data processing and analysis

The data were calculated and evaluated for both pre-intervention and post intervention members considered statistical significant by using of tally, excel and SPSS.
The collected data were entered using spreadsheet and data were exported to

Outcome indicators: -

1. Percent of booked patients whose surgery is cancelled with in the time frame.
2. Percent of patients admitted with complete PSAP/PSAA (pre- surgical Admission Assessment/ Pre-surgical Admission protocol) & necessary investigation.

5.14. Ethical considerations

- The project was approved by the SPSH. Approval by the hospital CEO and surgical department head was obtained prior to the study. The tool for assessment was submitted for approval by the CEO, and surgical department head. The data collection format use only code.
- Patients & respondents right must be considered.

5.15. Plan for dissemination of results

The result of the study will be presented to SPSH management and to all surgical staffs

5.16. Operational definition:

A. Elective surgery- non-emergency surgery which is medically necessary, but which can be delayed for at least 24 hours.

B. Cancellation-a planned operation that is not done on the day of the schedule time

C. Avoidable cancellations- were defined as those cancellations that could have been avoided had there been adequate review of patient‘s medical records or communication by hospital personnel before the day of surgery.

D. Data collection-The data was collected by reviewing the daily schedule lists for elective surgery with a pre designed form which included information about the patient and the presumed reasons for cancellation..

E. Data collectors: -The data collectors were two BSC nurses with more than two years of working experiences.

Chapter-Six: Intervention

6.1. Strategy/Alternative interventions

After identified by dissection the root cause of day of surgery (DOS) cancellation alternative strategies were selected based on the evaluation criteria by using decision matrix (impact, feasibility, cost and time) to intervene on avoidable cause of cancellations in pre intervention & post intervention plan.

The current intervention focuses on the first major identified cause for operation cancellation to improve operation room (OR) material (guan, cape and drape) evaluation as evidence of ask the purchaser, observe stock keeper house by asking of head of OR nurse. The following were comparative analysis of alternatives:

1. Schedule purchasing program
2. Budget allocation
3. Assess materials periodically
4. Aware the purchasers

Table-7:Alternative interventions

Root cause	Interventions
NO (Lack of) purchasing	1. Develop Schedule purchasing program
	2. Budget allocation
	3. Assess materials periodically
	4. Aware the purchasers

Table 2: Selection of the best intervention at St. Peter Specialized Hospital, Addis Ababa, 2018.

5- highest & 1 – least point

Intervention	Impact	Cost	Time	Feasibility	Total score
1.budget allocation	3	3	4	5	15
2.assess materials periodically	3	4	4	4	15
3. lack of OR materials purchasing	5	5	5	5	20
4. aware the purchasers	4	4	3	5	16

Lack of operation room purchasing program is identified as root cause for lack of operation room material (guan, cape and drape).the best intervention had been selected based on the following four criteria

1. Impact on problem

2. Cost

3. Time

4. Feasibility

Chapter-seven: Implementation of interventions

7.1. Purchased the important operation room materials

According to our study one of cause of cancellation register by shortage of OR material. Then to alleviate the problem we should plan (100 gowns, capes & drapes)to bought those surgical material for operation rooms. The materials have been allocated after 1 month plan for their intended purpose.

7.2. Awareness of staffs about the sustainability materials

A discussion was made with the operation room staffs as well as the hospital Matron for the sustainability of materials purchasing & maintaining materials in the future.

The ward nurses also confirmed that patients were ready for surgery through record reviewing

1. If consent form were signed,
2. If all requested investigations in the chart availed,
3. If pre-operative nursing care intervention as well as pre-operative nursing cares measures were accomplished.
4. And if last patient vital sign recorded before is sent to the operation room.

Chapter-Eight: Results

A total of 113 cases were booked &scheduled for elective surgery during the pre-intervention study period of these 104 were operated and 9were cancelled for shortage of OR material (gown ,cape and drape) reasons in pre intervention.

Among different surgical specialties Gynecology& obstetric surgery had the highest number of patients booked for elective surgery general surgery, the 2nd.Neurology is The list number of booked patients for elective surgery pre and post intervention. The highest cancellation is General surgery 5/30by the shortage of guan, cape & drape.

Table 2 Distribution of cases by specialty (Booked/ cancelled) at SPSH pre intervention

Specialty	**Registered on booked**	**cancelled from total booked %**	**Reason for cancelation**
General surgery	30	**5**	**Shortage of Guan ,cape and drape**
Maxillofacial	10	**0**	
Gynecology/Obstetric	50	**3**	**Shortage of Guan ,cape and drape**
Neurology	23	**1**	**Shortage of Guan ,cape and drape**
Total	113	**9(10%)**	

Table 3 Evaluation

Indicator	Pre intervention	Post intervention
Lack of purchasing surgical material (guan, cape & drape)	30 guan, cape & drape in number	130 guan, cape & drape in number

Table 4 Pre and post intervention: -Reasons for cancellations of elective surgery at SPSH. February/March 2010 E.C to April/May 30/ 2010 E.C

	Pre intervention	**Post intervention**
Reason for cancellation	**Frequency case cancelled by No. & %**	**Frequency case cancelled by No. & %**
Pt. related	**0**	**0**
Medical related	**1**	**0**
Shortage of OR equipment (guan, cape & drape) related	**9**	**0**
Shortage of time related	**0**	**0**
Staff related	**2**	**0**
Incomplete investigation related	**1**	**1**
Total cancel/ booked	**13/113**	**1/50**

To see effectiveness of interventions the evaluation methods /measuring instrument/ are observation and tally as post- intervention assessment.

Chapter-Nine: Discussion

9.1. Implementation status of the cancellation

In this capstone study the cancellation rate by shortage of OR material in the pre intervention period was 10% of adult patient booked for elective surgery in Saint Peter Specialized Hospital. When it compares with other studies the value is at Saudi Arabia (17) and 25.5% at Sudan (18) and in India (10). At Tanzania (21%), South Africa (5.6%)Sudan (10.5%), Nigeria (28%) and Jimma University (23%) ,in Tikur Anbesa specialized hospital 27.4%.

In this cancelation rate comparatively less from Jimma University, Tikur Anbesa specialized hospital, Saudi Arabia, Tanzania, Nigeria but from India, Sudan were similar. Also from South Africa was high.

This difference might be due to: the study area, sample size, size of the facility, measurement criteria. The frequencies of elective booking in this study were 113 in pre intervention,50 in post intervention. The correlation between two was 40 patients. To decrease cancellation of day of surgery as low as 5%. In line with our study and intervention, a number of studies identified and documented that improving the service of preoperative evaluation clinic at the outpatient level as well as assessment a day before surgery and proper pre-operation preparation at the ward improves day of surgery cancellations.

The objective of the study in developing countries was to decrease cancellation of day of surgery as low as 5%. An efficient surgical service should have a low rate of cancellation of operations. The most common reasons for cancellation identified by this study the pre intervention period were shortage of operation material 10%.

This study implies that hospitals will not be able to succeed in reducing the rate unless they tackle each problem in the process beginning from the initial process of admission and needs coordination an participation effort from all concerned body in the hospital. From the reasons discussed above it is obvious that all cause of cancellation are if given attentions can lead to better utilization of hospital resource, improve performance and increase patient satisfaction. The impact of this intervention was to improve hospital performance, better utilization of hospital resource and less patient discomfort and finally to provide quality health care increased patient and staff satisfactions.

9.2. Strength and limitations

Strength

Most of all awareness on reasons for cancelation and root cause of the cancellation were identified in this study which helps to reach to specific solutions.

Limitation

There was shortage of time during pre and post intervention. The hospital surgical ward is nearly established no system to recording the information regarding cause of surgical cancellation on the individual medical record and makes it difficult to get base line data and KPI data quality.

Chapter-Ten: -Conclusion and recommendation

10.1. Conclusion

- Cancellation of elective surgical procedures on the scheduled day of surgery was high during the study. Most of the reasons were shortage of time, management related, patient related, the first common reason is shortage of OR material (guan, cape and drape).in St. Peter specialized hospital.
- At this study most of the reasons for cancellation were avoidable and can be prevented by different methods. Cancelation can be minimized if the problems were detected early and as soon as scheduled for operation.
- The deference in booking and cancelation rate were seen among specialties in both pre and post intervention period. Objective is todecreaseby 5% after post-intervention but the result is more than our expectation.

10.2. Recommendation

- Implementation of patient pre-operative assessment should be applied. A team approach ensuring presence of policies and procedures for improving and ensuring realistic scheduling of theatre lists, reducing time spent preparing and cleaning and better handling resources.
- In order to enhance cost-effectiveness and efficiency; efforts should be made to prevent unnecessary postponement through careful planning aim at increasing operation theatre spaces and efficient utilization of few available hospital resources including that of the operating room, theatre facilities and valuable man power improving the scheduling and admission procedure is required for better use of hospital. Plan to solve water problem. And daily evaluate hospital laundry drying machine to OR guan cape & drape and ready for serialization processes.
- Monthly reports should be sent to Directorate director/operating room Director Teams to monitor causes of cancelled operation, taking into consideration the distinction between avoidable and unavoidable causes.

I would like to recommend the implementation of control charts for monitoring cancellation of Operations.

References

1. Einar H. A new pathway for elective surgery to reduce cancellation rate. BMC health service research.2012, volume 12:154.
2. Wei X. Dynamics of Elective Case Cancellation for Inpatient and Outpatient in an Academic Center. HHS public access.2013, May 13, 4(5):314.
3. EbirimL. N, Buowari D.Y and Ezike H.A. Causes of cancellation of elective surgical operations at University Teaching Hospital. Journal of Medicine and Medical Sciences Vol.3 (5) pp. 297301 May 2012
4. Chalya PL. Incidence causes and pattern of cancellation of Elective surgical operations in a University Teaching Hospital in the Lake Zone, Tanzania. African Health Science. Sep 2011, Volume 11, No 3.
5. González-Arévalo' Janet ale. Causes for cancellation of elective surgical procedures in a Spanish general hospital, Journal of the association of Anesthetists of Great Britain and Ireland, May 2009,64(5):487-493.
6. El Bushra D, Mohamed M, MD Cancellation of scheduled surgical operations on the day of surgery, Sudan medical journal, 2008,8:1,2.
7. .Ju-Hsin C. Case review analysis of operating room decisions to cancel surgery, BMC surgery 2014 July 23, 14:47.
8. Kari D. Reduced elective surgery cancellation, University Hospital of North Norway 2014
9. Dr. Mastodon, Prof. Foard Ali M , Dr. Far hat J , Dr. Abdul K. Operations; cancellation on the intended day of surgery. Professional Med J 2014; 21(1): 001-004.

10. Rakesh G, Anju R, Poona B, Nish Karsh G, and Raktima . Reasons for Cancellation of Cases on the Day of Surgery–A Prospective Study. Indian Journal of Anesthesia.2009 Feb; 53(1).32

11. Laisi J, Tohmo H, Keränen U. Surgery Cancelation on the Day of Surgery in Same-Day Admission in a Finnish Hospital, Scandinavian Journal of Surgery September 2013 vol. 102 no. 3204-208

12. Sanjay P, Dodd's A, Miller E, Arum gam PJ, Woodward A. Cancelled elective operations: an observational study from a district general hospital.US National Library of Medicine National Institutes of Health 2007; 21(1):54-8.

13. CH Chiu, Anna Lee, PT Chui, Cancellation of elective operations on the day of intended surgery in a Hong Kong hospital: point prevalence and reasons, Hong Kong Med J. 2012; 18:5–

14. A El-Dawlatly, A Turkistan, Aldohayan, A Zubaidi, A Ahmed. *Reasons of Cancellation of Elective Surgery in A Teaching Hospital*. The Internet Journal of Anesthesiology. 2007 Volume 15, Number 2.

15. Nab eel S, Abdul R, Syed M Abbas. Reasons for cancellation of elective cardiac surgery at Prince Sultan Cardiac Centre, Saudi Arabia, Journal of the Saudi Heart Association. January 2012Volume 24, Issue 1, Pages 29–34.

16. AR shad Z, Tariq M, Samson G, Sajjad A, Johar A. cancelled elective general surgical operations in ayub teaching hospital, J Ayub Med Coll Abbottabad 2007; 19(3):66.

17. Khalid O Dhafar et al. Cancellation of operations in Saudi Arabian hospitals: Frequency, reasons and suggestions for improvements, PAKISTAN JOURNAL OF MEDICALRESEARCH · SEPTEMBER 2015, Pak J Med Scienc 2015 Vol. 31 No. 5section of National Hospital of Sri Lanka – can we do better? May to August 2012.

18. Tauseef A. Mueenullah KFauzia K. Cancellation of surgery in patients attending the preoperative anesthesia assessment clinic: a prospective audit, J Pak Med Association, August 2009, Vol. 59, No. 833

19. Ulla C. Jon K. Lars-Eric O. Kristina S. Incidence and root causes of cancellations for Orthopedic procedures a single center experience of 17625 consecutive cases, Patient Safety in Surgery 2014, 8:2418.

20. Chasm, F.R.C.S,F.C.S (SA). Why is surgery cancelled? A retrospective evaluation, SAJS General Surgery. AGUST 2008, VOL 46, NO.3:79.

21. Elrahman A. Magnitude of cancelled elective general surgical operations at Omdurman Teaching Hospital, 2012 – 2013, Sudan Med J 2014 August;50(2)

22. Ebirim L.N, Buowari D.Y and EzikeH.ACauses of cancellation of elective surgical operations at a University Teaching Hospital. Journal of Medicine and Medical Scion

Annex

Registration form for Elective Surgical cancelation (Make tally on the box

S. No.	Name of Pt.	M.R No Age Sex	Region Telephone NO.	Date of Admission	Diagnosis	Date of schedule	Date of Reschedule	Cause of cancelation/Reschedule/					
								Pt. Related	Medical Related	OR Equipment Related	Shortage of time	Incomplete investigation	Staff related