

**Time management in Operation theatre: A Utilization study of Operation Theatres of CK
Birla Hospital | RBH, Jaipur**

Dissertation Submitted to



The IIHMR University, Jaipur

for the partial fulfillment for the award of the degree of Master
of Business Administration (MBA)

in

Hospital and Health Management

by

Syed Ayaz Alam

Under the Supervision and Guidance of

Prof. Goutam Sadhu

2022

**Time management in Operation theatre: A Utilization study of Operation Theatres of CK
Birla Hospital | RBH, Jaipur**

Dissertation Submitted to



The IIHMR University, Jaipur

for the partial fulfillment for the award of the degree of Master
of Business Administration (MBA)

in

Hospital and Health Management

by

Syed Ayaz Alam

Under the Supervision and Guidance of

Prof. Goutam Sadhu

2022

DECLARATION BY STUDENT

I hereby declare that this dissertation titled “Time management in Operation theatre: A Utilization study of Operation Theatres of CK Birla Hospital | RBH, Jaipur” is the bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

(Signature)

Name of Student

Date

CERTIFICATE

This is to certify that Syed Ayaz Alam in partial fulfillment of the requirements for the award of the degree of MBA (Hospital and Health Management from the IIHMR University, Jaipur has successfully completed his internship at CK Birla Hospital, Jaipur during March 2022 to June 2022.

Place:

Preceptor/Head of the Organization

Date:

Name of the organization

CERTIFICATE

This is to certify that dissertation titled Time management in Operation theatre: A Utilization study of Operation Theatres of CK Birla Hospital | RBH, Jaipur is a record of the research work undertaken by Syed Ayaz Alam in partial fulfillment of the requirements for the award of the degree of MBA (Hospital and Health Management) from the IIHMR University, Jaipur under my guidance and supervision and his/her approach to the research study has been sincere, scientific, and analytical.

Faculty Guide

IIHMR University, Jaipur

Date

School Dean

IIHMR University, Jaipur

Date

ABSTRACT

Introduction: Operating rooms, often referred to as the "heart of the hospital". It is a specialized hospital unit where invasive procedures on the patients are carried out under strict aseptic and in a controlled environment by trained professionals. "Time utilization" is one indicator of an OT's performance. Donham and colleagues defined this as the ratio between the total number of available hours actually used and the actual number of hours available for usage.

Review of Literature: As the maximum possible Operation theatre utilization is approximately 85% as per global guidelines. So, we can possibly reach this benchmark by covering the gaps and meeting the two ends that are – Ensuring proper scheduling of OTs and time management in OTs. The gaps can be filled by:

- Starting the procedures on scheduled time,
- Improving the efficiency and utilization of equipments,
- Proper planning of OT,
- Perfect optimization of resources and
- Proper communication between the staff at OT.

Methodology: The research is aimed at finding out the reasons for the gap in ideal utilization time utilization time as per of the operation theatre. Thereby, suggest ways to improve the OT utilization of CK Birla Hospital | RBH, Jaipur. The study design being Descriptive, observational and cross-sectional study. The study period is of 3 months from March 2022 to May 2022 and all the procedures that were performed in the hospital during this period were incorporated in the study.

Results & Discussion: Orthopaedics and Urology speciality together had more than 50% case load during the study period. OT Utilization percentage was highest for the month of May'22, which is very good in terms of previous months taken in the study. Cycle of March'21 – May'21 had a declination in average OT Utilization, on the other hand cycle of March'22 – May'22 saw an inclination in average OT Utilization. Most common delays like Extension of previous surgery and the patients not being admitted on time should be met thereby enhancing

the OT Utilization.

Conclusion: OT-1 and OT-5 were being better utilized than other Operating rooms. Highest number of cases were taken in OT-6 during March'22 - May'22 still because of reasons like not proper scheduling of OTs and improper communication between the staff the OT was not Utilized to its full capacity. The number of delays were a bit on the higher end. The biggest reason of delay being extension in previous surgeries. Typically shows mis-management in scheduling of OTs and maintaining TAT for surgeries.

Recommendations: Working a bit more with the marketing team. Proper Scheduling of OTs, Staff coordination, admission and processing and starting the case on time are few things to be worked upon.

ACKNOWLEDGEMENT

Research connects a person's theoretical knowledge & practical experience. This research helped me a lot to learn & grow.

My research would not have been possible without the guidance, supervision and help of many people.

I wish to express my sincere gratitude to **Dr. Suhasani Jain**, Medical Superintendent - CK Birla hospitals, Jaipur for giving me an opportunity to commence my project. I am deeply indebted to her for her in-depth support, stimulating suggestions and encouragement throughout my training period as well as providing necessary information regarding the project.

I would greatly thankful **Mr. Akhilesh Singh**, Head HR – CK Birla hospitals, Jaipur for allowing me to work on my dissertation report and also for his cooperation, encouragement and motivation.

I sincerely thank **Dr. Gaurav Sharma**, Manager (Quality) - CK Birla hospitals, Jaipur for his guidance and encouragement in carrying out this project.

I would also like to thank **Mr. P.R. Sodani**, President – IIHMR University, Jaipur for giving me the opportunity to do this internship and perform this research.

I am also thankful to my mentor **Prof. Goutam Sadhu**, Professor – IIHMR University, Jaipur for his support, enthusiasm, motivation & immense knowledge. His guidance helped me in all the times of this secondary research.

Finally, I would like to appreciate my family and friends for the wonderful cooperation shown by them during the project. My thanks and appreciation also go to my colleagues in developing the project and people willingly helping me out with their abilities.

TABLE OF CONTENTS

S. No.	Content	Page No.
1	Introduction	1 – 7
2	Review of Literature	8 – 11
3	Methodology	12 – 14
4	Results	15 - 26
5	Discussion	27
6	Conclusion	28
7	Recommendation	29
8	References	30
9	Annexures	31

LIST OF FIGURES

Figure No.	Figure	Page No.
1.1	OT layout (CK Birla hospital, Jaipur)	3
1.2	Process flow of patients	4 - 7
4.1	Total no. Of surgeries march'22 - may'22	15
4.2	OT wise comparison (march 2022)	16
4.3	OT wise comparison (April 2022)	17
4.4	OT wise comparison (may 2022)	18
4.5	Department wise case distribution	19
4.6	Utilization comparison chart	20
4.7	Percentage of utilization 2022	21
4.8	Total no. Of surgeries 2021 v/s 2022 (march - may)	22
4.9	Comparison of OT utilization percentage 2021 v/s 2022 (march - may)	23
4.10	OT wise delay	24
4.11	Specialty wise delayed cases	25
4.12	Reason wise delays	26

LIST OF TABLES

Table No.	Content	Page No.
1	Review of Literature	8-11

ABBREVIATIONS

OT – Operation Theatre

RBH – Rukmani Birla Hospital

TAT – Turn Around Time

TSSU – Theatre Sterile Supply Unit

OR – Operating room

CTVS – Cardio Thoracic & Vascular Surgery

OBGY – Obstetrics & Gynaecology

TPA – Third Party Administrator

PAC – Pre-Anaesthesia Checkup

Pre -OP – Pre-Operation Area

Post -OP – Post-Operation Area

ICU – Intensive Care Unit

AIIMS – All India Institute of Medical Sciences

MRN – Medical Record Number

OPD – Out Patient Department

CHAPTER 1: INTRODUCTION

Operating rooms, often referred to as the "heart of the hospital". A hospital's budget includes a large expense for the operating room. It is crucial to conduct a utilization study of the operating rooms to increase operational effectiveness. The OT complex is used to its full potential, which not only lowers operating expenses but also boosts income.^[1]

The objective of the OT is to promote healing and cure with the maximum amount of safety, comfort, and efficiency. It is a specialized hospital unit where invasive treatments on the human body are carried out under strict aseptic conditions in a controlled environment by professionally trained professionals. OT efficiency may be evaluated in a variety of ways. It is frequently described in terms of the capacity to turn available time into cash. Utilization is an easy-to-understand and good indicator of a theater's effectiveness because it may generate more money the more it is utilized.^[2]

Also, the acute health system urgently needs to make the best use of its resources. Operating rooms are one such category of resources that significantly affect how patients move through the hospital. Data-driven insights into how operating rooms are used might propose changes to reduce waste and increase the availability of operating rooms. Both interventions that save lives and improve quality of life take place in operating rooms. The operating room is a genuine test of the phrase "TEAM," which stands for "Together Everybody Achieve the Maximum," since it requires interdisciplinary teamwork. The key components in the effective usage of OTs are strong rapport, good communication skills of the OT in charge, devoted, properly trained employees, adequate services equipment, and layout.^[3]

It is necessary to plan distinct tasks in an OT methodically in order to allocate workers effectively. Working closely together, anaesthetists and surgeons will be required for this. The timing of procedures realistically will prevent operations from being cancelled. Potentially time-consuming procedures should be identified and planned so that they can be finished in the time allotted.

In addition to disrupting patient flow, cancellations and delays can reduce theatre throughput, wasting resources. Patients who are subjected to cancellation suffer psychological distress as a result of having to go through the pre-operative clinical and mental preparation process again. The sufferer and their relatives may suffer severe emotional and financial effects.

Pre-operative planning and evaluation, beds, the capacity of the theatre sterile supply unit (TSSU), and staffing levels in other specialties are only a few of the many resources that have an impact on the efficiency of the theatre.^[4]

"Time utilization" is one indicator of an OT's performance. Donham and colleagues defined this as the ratio between the number of elective resource hours actually used and the actual number of elective resource hours available for usage.

Therefore, this short study is conducted in a multispecialty hospital prospectively over a period of 3 months to study the OT utilization time and to find out the reasons for the gap in ideal utilization time of the operation theatre.

Different zones of OT complex

- Protective zone: It includes.
- Clean zone: Connects protective zone to aseptic zone and has other areas also like.
- Aseptic zone -Includes operation rooms (sterile)
- Disposal zone -Disposal areas from each OR & corridor lead to disposal zone.

Staffing of OT

- Doctors – A team of 8 Anaesthesia doctors + Around 25 Consultants who have the privilege of doing surgeries.
- OT In charge – 1
- Nursing In charge – 1
- Nurses – 25
- Technicians – 11 (CTVS + General Surgery)
- Perfusionist – 2
- Housekeeping Staff
- Health Care Assistants

Distribution of OT rooms according to specialities.

- OT1 – Orthopaedics
- OT2 – Orthopaedics + Neurosurgery
- OT3 – OBGY & General Surgery
- OT4 – CTVS Surgeries
- OT5 – Urology & Renal Transplant
- OT6 – Urology & Renal Transplant

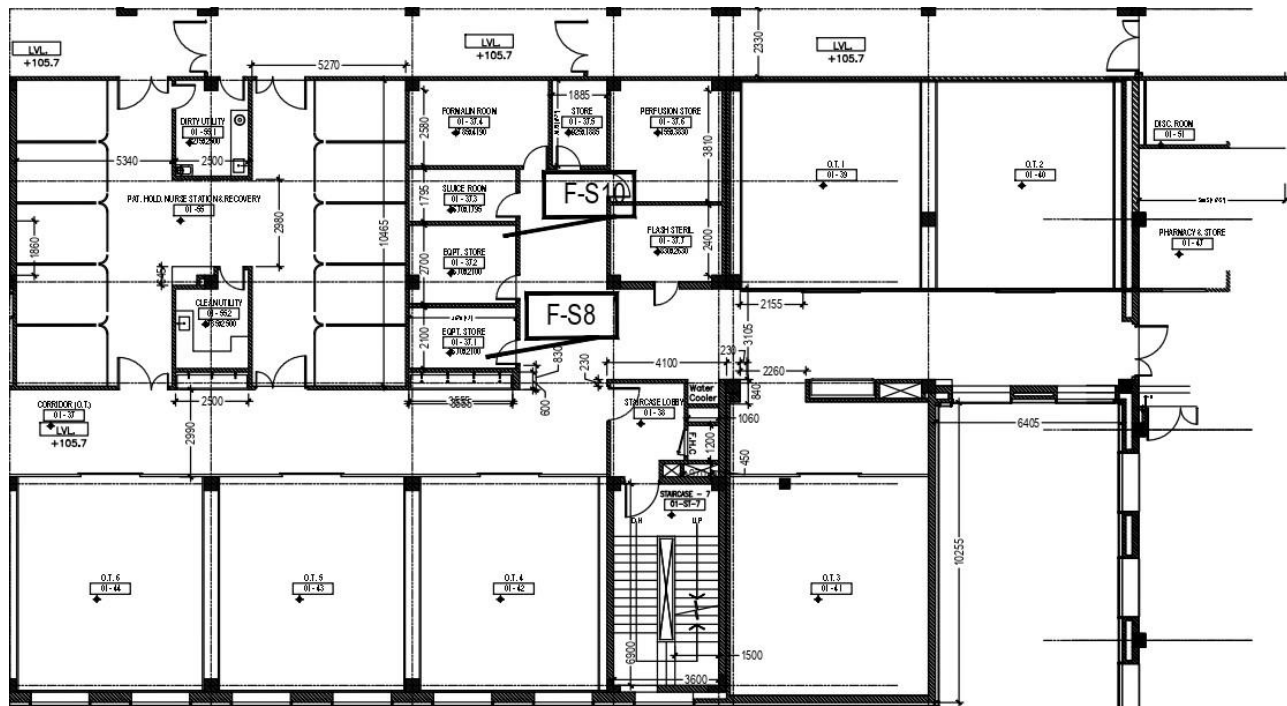
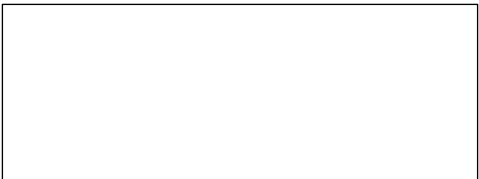
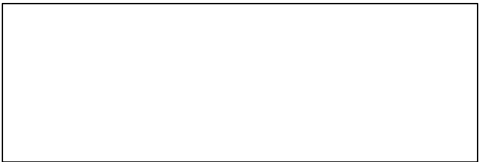


Figure 1.1 OT Layout (CK Birla Hospital, Jaipur)

PROCESS FLOW OF PATIENTS

An empty rectangular box with a thin black border, intended for a diagram or text related to the patient process flow.An empty rectangular box with a thin black border, intended for a diagram or text related to the patient process flow.An empty rectangular box with a thin black border, intended for a diagram or text related to the patient process flow.An empty rectangular box with a thin black border, intended for a diagram or text related to the patient process flow.



--

PATIENT
NOT FIT

--

PATIENT FIT

--

--

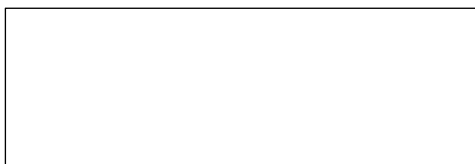
--

--

--

--

--



CHAPTER 2: REVIEW OF LITERATURE

Table 1 Review of Literature

Name of Author	Title of study	Salient features
K Vinukondaiah, N Ananthakrishnan and M Ravishankar	Audit of operation theatre utilization in general surgery	Sample size – 1773 procedures Study location – Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry Finding of the study: Delay in starting lists, under-scheduling, interruption due to emergency surgeries, administrative reasons, induction of anaesthesia and recovery policies are the main factors that account for inefficient use of operating facilities. The correction of these factors would increase the available operating time by nearly 20%
Shraddha Vidyadhar Naik, Vithal Krishna Dhulkhed, and Rewa	A Prospective Study on Operation Theater Utilization Time and Most Common Causes of Delays and Cancellations of Scheduled Surgeries in a	Sample size – 548 Procedures Study location - Rural Maharashtra Finding of the study: Most of the causes of delays and cancellations of surgeries were avoidable with proper

Hemant Shinde	1000-Bedded Tertiary Care Rural Hospital with a View to Optimize the Utilization of Operation Theater	preoperative planning and optimization of patients and resources and good communication between surgeon anesthesiologists and the nursing staff.
A P Pandit, Tushar G Dive and Anupam Karmakar	A study of factors affecting utilization of OT	Sample size - 4 month's data of performed surgeries was taken Study location - D Y Patil Hospital, Navi Mumbai Finding of the study: The utilization time of existing OT complex is 40.37% and the maximum possible OT utilization by global standard ranges from 85% to 90%. So, there is a gap of 45% to 50%. The gap can be utilized if the insurance cases in which approvals are required are processed faster. So, the gap can be fulfilled by • Scheduling TPA cases properly • Starting the case on time • Increasing the number of multi- purpose trolleys and many other such measures can be taken.
S Talati, AK Gupta, A Kumar, SK Malhotra, and A Jain	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	Sample size – 325 Procedures Study location – A tertiary care teaching institute of North India. Finding of the study: Of the total 325 scheduled cases, 252 were operated and 73 (22.5%) were cancelled. There were delays on 15 days (15.63%) in starting the

		OT table at the scheduled time. Of the total resource hours (46,080 min), the mean “Raw utilization” was 37,573 min (81.54%) and the “Adjusted utilization” was 39,668 min (86.09%). The mean time spent on “supportive services” was 5539 min (12.02%) and on “actual surgery” was 28,277 min (61.37%), and the “room turn over time” was 2095 min (5.39%). Among the stated reasons for cancellations, lack of operating time — 57 cases (78.1%) — was the most common.
Reena Kumar and R.K. Sarma	Operation Room Utilization at AIIMS, a Prospective Study	Sample size - 13,130 Procedures Study location – Main OT complex AIIMS Finding of the study: Information sought on waiting list for surgeries showed that average waiting time for routine surgical procedures ranged from 6 months to 3 years for various benign disease and from few weeks to 3 months for malignant disease. In spite of long dates given, majority of dated patients do turn up on the appointed date except during festive season. Majority of residents and consultants felt that if additional inputs are given in minor O.T.'s (in the OPDs), main O.T. time can be utilized better. However, it would necessitate upgradation of the minor O.T.'s with respect to infrastructure, staffing and equipment.
Dr.Mekala Jaya Krishna , Dr. K V	A Retrospective Study on Utilization of Operation Theaters In A Tertiary Care	Sample size – 665 Procedures Study location – Osmania General Hospital (OGH),

Sandeep And Dr. Anuradha	Teaching Hospital	Hyderabad Finding of the study: The average utilization of all OTs in the institute for the time period was found to be 85% ranging between which reveals the all OTs are adequately utilized and OT utilization time was found to be optimum.
Ali M. Alahmari and Omar Z. Alsharqi	Factors Affecting the Main Operation Room Utilization Time at King Abdullah Medical City	Sample size – 448 Procedures Study location - King Abdullah Medical City Finding of the study: 94.2% of ICU beds post-operative were available. Also, 77.9 % of surgeon' attendance on time and 75.5% of the first cases started on time. Highly statistically significant difference between 2017 and 2018 in relation to predictor factors of operation room utilization time was found.

CHAPTER 3: METHODOLOGY

RESEARCH QUESTION:

What is the utilization of OTs at CK Birla Hospital | RBH, Jaipur and what are the measures to improve the utilization percentage?

OBJECTIVES:

- To compare the utilization of OT.
- To analyze the utilization and compare with total hours available for utilization.
- To find out the reasons for the gap in ideal utilization time of the operation theatre.

RESEARCH DESIGN:

- **Study design**

Descriptive, observational and cross-sectional study based on retrospective data and prospective study of utilization of OTs at CK Birla Hospital | RBH, Jaipur.

- **Study setting**

Operation theatres of CK Birla Hospital | RBH, Jaipur

- **Duration of study**

The study period is from March'2022 to May'2022. In addition, a comparison was done between March'2021 – May'2021 and March'2022 – May'2022.

- **Study Population and Sampling**

All the patients whose operation was performed between March'2022 to May'2022. No sampling was done in the study as all the procedures performed during the period were included in the study.

- **Data collection:**

Primary data collected from March'2022 to May'2022 for the study was collected and analyzed with the help of OT list.

Secondary data collection (March'2021 – May'2021) for the Comparison study was obtained from the Healthcare management information system.

- **Data analysis:**

Microsoft Excel

- **Data Management**

Utilization study:

- Scheduled Time- The time at which surgeries should start.
- Patient Wheel in Time- The time at which the patient is taken into the OR.
- Patient Wheel out Time- Time at which the patient is shifted from OR to Post-op area.
- Utilized hours- Difference between Patient Wheel out time and Patient

Wheel in time.

- Delay- Difference between scheduled time of case and patient Wheel in time of the case.

- **The theatre utilization rate will be determined as follows:**

- Total hours for which the OTs were utilized / Total hours for which the OTs were operational X 100
- Total Operational hours is considered as the duration from 8am to on all days of the week, except for Sunday and Government Holidays.
- Hours OT utilized is determined by the sum of total hours utilized in surgery and total hours utilized in cleaning of OTs
- Cleaning Time is calculated using the formula = $15/60 \times \text{no. of surgery}$

- **Limitations**

There are few limitations to this study. Firstly, the study was conducted for a short period of time (3 months). Secondly, I did not evaluate the possible causes of delays in detail. Lastly the socioeconomic impact of prolonged OT times was not evaluated.

- **Ethical considerations**

Confidentiality and anonymity for all the procedures done at the hospital whose data was utilized for the study is strictly maintained. Also, patient's MRN number and hospital details were not utilized in making of this thesis.

- **Implications of the research**

The research is aimed at finding out the reasons for the gap in ideal utilization time utilization time as per of the operation theatre. Thereby, suggest ways to improve the OT

utilization of CK Birla Hospital | RBH, Jaipur.

CHAPTER 4: RESULTS

The result section depicts the Analysis of data using graphs and interpretation of the same for both prospective study done (March'2022 to May'2022) and retrospective study done (March'2021 to May'2021).

Figure 4. 1 Total number of surgeries done during March 2022 to May 2022.

Interpretation: Total of 1249 surgeries were performed during the study period in 6 OTs of CK Birla Hospital, Jaipur. The graph depicts the total number of surgeries performed at

CK Birla Hospital, Jaipur from March 2022 to May 2022. The graph clearly shows highest number of surgeries were done during the month of May 2022 which was 464, followed by March 2022 (394) and lastly April (391).

Figure 4.2 OT wise comparison of the month of March 2022.

Interpretation: The month of March'22 had a total of 1560 Operational hours and out of which there were a total of 925 surgery hours. The graph depicts OT wise comparison of Operational hours with surgery hours and number of surgeries for the month of March 2022. The graph clearly shows that the surgery hours of OT-1 and OT-5 were more among all the other OTs i.e., 182 hours out of total available 260 operational hours and 177 hours out of total available 260 operational hours. Whereas the surgery hours of OT-4 and OT-6 were less in numbers with 138 hours for each OT. Although the highest number of cases i.e., 92 in the month of March 2022 were done in OT-6 still it had a total surgery hour of 138 hours.

Figure 4.3 OT wise comparison of the month of April 2022.

Interpretation: The month of April'22 had a total of 1560 Operational hours and out of which there were a total of 887 surgery hours. The graph depicts OT wise comparison of Operational hours with surgery hours and number of surgeries for the month of April 2022. The graph clearly shows that the surgery hours of OT-5 was the highest (183 hours out of total available 260 operational hours). Whereas the surgery hours of OT-4 were the lowest (96 hours out of total available 260 operational hours). Although the highest

number of cases in the month of April 2022 were done in OT-6 still it had a total surgery hour of 147 hours.

Figure 4. 4 OT wise comparison of the month of May 2022.

Interpretation: The month of May'22 had a total of 1500 Operational hours and out of which there were a total of 1014 surgery hours. The graph depicts OT wise comparison of Operational hours with surgery hours and number of surgeries for the month of May 2022. The graph clearly shows that the surgery hours of OT-5 was the highest (209 hours out of total available 250 operational hours). Whereas the surgery hours of OT-4 were the lowest (98 hours out of total available Operational hours of 250 hours). Also, the highest number of cases in the month of May 2022 were done in OT-5(110) and the cumulative of total duration of surgeries in the month of May 2022 was 209.

Figure 4.5 Department wise case distribution during March 2022 – May 2022.

Interpretation: There were a total of 1249 surgeries performed during the study period. The graph depicts department wise case distribution from March 2022 to May 2022 at Ck Birla Hospital, Jaipur. The pie chart shows that Orthopaedics had the highest number of cases at the hospital. Orthopaedics and Urology are the two specialties that makes out for more than 50% of the total surgeries performed during the period. Followed by OBGY i.e., 16%.

Figure 4. 6 Utilization chart of OTs during March 2022 – May 2022.

Interpretation: The graph depicts the comparison of total Operational hours with total Utilized hours from March 2022 to May 2022. It can be clearly seen in the bar graph that even though May 2022 out of the 3 months had just 1500 operational hours (60 hours less than the other two months) the total utilized hours were highest in the month of May 2022 i.e., 1130 hours. Followed by March'22 which had total utilized hours of 1024 hours and last in the line was April'22 which was in total utilized for 984 hours.

Figure 4.7 Percentage of OT Utilization during March 2022 – May 2022.

Interpretation: The graph depicts percentage of OT Utilization from March 2022 to May 2022. The graph clearly shows that OT Utilization percentage has increased in the last 3 months by approximately 10%. Also, the OT Utilization percentage was highest in the month of May i.e., 75.33%, followed by 65.62% in March 2022 and 63.09% in April 2022.

Figure 4.8 Comparison between the total number of surgeries performed during March 2021 – May 2021 and the study period i.e., March 2022 – May 2022.

Interpretation: The graph depicts the comparison of total number of surgical cases performed per month at CK Birla Hospital from March 2021 to May 2021 with the total number of surgical cases performed per month from March 2022 to May 2022.

A decline was seen in the number of surgeries performed from March 2021 to May 2021, whereas an inclination was seen in the number of surgeries performed over the 3 months from March 2022 to May 2022.

The total number of surgeries performed during March 2021 – May 2021 was 638, whereas a total of 1249 surgeries were performed during the study period i.e., March 2022 – May 2022.

Although considering COVID-19 during the month of May 2021 still there were almost half the number of surgeries performed during March 2021 – May 2021 than the study period i.e., March 2022 – May 2022.

Figure 4.9 Depicts comparison between the percentage OT Utilization of March 2021 – May 2021 and the study period i.e., March 2022 – May 2022.

Interpretation: The graph depicts comparison of percentage OT Utilization of March 2021 – May 2021 with percentage OT Utilization of March 2022 – May 2022.

The graph clearly shows that the percentage OT Utilization from March 2021 to May 2021 saw a decline in the percentage OT Utilization with average OT Utilization of 34%. Whereas the percentage OT Utilization from March 2022 to May 2022 saw an inclination in the OT Utilization percentage with average OT Utilization of 68%.

The OT Utilization percentage was highest in the month of May'22 with 75.33% followed by 65.62% in March'22.

Figure 4.10 Depicts OT wise delays during March 2022 – May 2022.

Interpretation: The graph depicts OT wise delays from March 2022 to May 2022. There were a total of 224 delays out of 1249 surgeries that were performed from March 2022 to May 2022. From the above graph it's clear that mostly the delay occurs in the OT-3 on an average of the 3 months taken in the study period with 56 delays in total. Whereas OT-4 had least number of delays reported with just 13 delays.

Figure 4.11 Department wise delays March 2022 – May 2022.

Interpretation: The graph depicts department wise delays from March 2022 to May 2022. The pie chart clearly shows that out of total number of surgeries performed during March'22 to May'22 most of the delay occurred in both Orthopaedics and Urology specialty with 31% delays for each. Followed by 18% in General surgery, 7% and 6% in OBGY and neurosurgery respectively.

Figure 4.12 Depicts Reason wise delays during March 2022 – May 2022.

Interpretation: The graph depicts reason wise delays from March 2022 to May 2022. The bar graph shows that almost 40% (92 cases of 224) of the delays in the OT during the study period was because of an Extension in the previous surgery. Whereas patients not being admitted on time is also a major issue with 44 cases delayed out of the total of 224 cases.

CHAPTER 5: DISCUSSION

- Surgery delays and cancellations because of inefficient scheduling and utilization of theatre time are frequent occurrences throughout the globe.
- Numerous research have shown that this inefficiency in scheduling and utilization of the OTs results in wastage of time which could have been utilized for another surgery

and also the extension of patient stay at the hospital, which in turn raises the expense and emotional investment.

- With 638 surgeries performed during March'21 – May'21 and 1249 surgeries performed during March'22 – May'22. Almost twice the number of surgeries were performed during March'22 – May'22 in Year-to-year comparison.
- Number of surgeries performed have significantly increased in the year 2022. Also, increase in the OT utilization percentage was to be seen. Both the years witnessed maximum surgeries being conducted of Orthopaedics and Urology specialty from March to May.
- On comparing the OT utilization of the two period. OT utilization percentage has increased from 34% during March 2021 to May 2021 to 68% during March 2022 to May 2022.
- Total Operational hours from March 2022 to May 2022 for all the OTs was 4620 hours out of which 3137 hours were used. Overall utilization percent in March 2022, April 2022 and May 2022 was 65%, 63% and 75% respectively.

CHAPTER 6: CONCLUSION

- Since the hospital has been operational since 2016, the utilization of the operation theatre has improved over the years, and the average utilization of the Operation Theatre during the study period was found to be 68%.
- This study highlights comparison of total number of surgeries performed and comparison of OT Utilization percentage between March – May 2021 and March –

May 2022. When the data year to year comparison was done for number of surgeries performed and OT utilization it was found that OT were better utilized during March 2022 – May 2022 and also an increase in the utilization was seen during the months from March 2022 to May 2022. Indeed the study period had more number of surgeries performed as compared with the retrospective data of March 2021 to May 2021.

- The major observations that influenced the utilization of the OTs were the delays observed in March to May 2022. Both, Orthopaedics & Urology speciality contributed to 31% of delays, with maximum case delay caused due to extension of previous surgeries. Other reasons for delays were, Delay due to patient's admission not on time, surgeon delays, Investigation delays, Emergency delays, etc. Overall, it was observed that 224 cases were delayed out of total 1249 surgeries performed from March 2022 to May 2022.
- Determining the major causes and bottlenecks creating hurdles in smooth functioning of the Operation Theatres and correcting them without any lag is imperative to increase the utilization of the Operation Theatres. Observations related to improper management of OT list and lack of adequate resources were seen.

CHAPTER 7: RECOMMENDATIONS

- The hospital has state of the art infrastructure and can be utilized more efficiently as there are scopes of improvement in:
 - ❖ Proper Scheduling of OTs.
 - ❖ Staff coordination.
 - ❖ Admission and processing.
 - ❖ Starting the case on time.
- As Scheduling of the OTs is very important The date, day, time, and operation theatre number should be properly prepared for the surgeries based on the resources that are available. There is a need to discuss with the consultants and finalize the duration of surgery before scheduling the cases. Also, seeing to it that extension in previous surgeries delay is reduced thereby improving the OT Utilization percentage. Not to forget there can be exceptions and delays may always occur still we can work more on reducing them.
- Staff coordination being another issue of delays. So, the surgeon, anaesthetists and staff should be present in the OR on time. If not before, then within five to ten minutes of the patient's arrival. By permitting the necessary blocking of the OPD slots without any confusion or lag, doctors should be prompted to arrive to the Operation Theatre on time.
- Procedures should be started and finished on time. As previous case extended is a big issue at CK Birla hospital, Jaipur. As extension can occur in a surgery due to complications and the surgeons should keep in mind all the major and minor variables before starting a surgery so that nothing goes wrong and the surgery is started and finished off on time. The practice of writing tests on the day of surgery should stop.

REFERENCES

1. Pandit A, Dive T, Karmakar A. A study of factors affecting utilization of OT. Indian Journal of Public Health Research & Development. 2018;9(8):91.
2. Naik S, Dhulkhed V, Shinde R. A prospective study on operation theater utilization time and most common causes of delays and cancellations of scheduled surgeries in a 1000-bedded tertiary care rural hospital with a view to optimize the utilization of operation theater. Anesthesia: Essays and Researches. 2018;12(4):797.
3. Jaya Krishna D, Sandeep D. [Internet]. iosrjournals.org. 2022 [cited 29 June 2022]. Available from: <https://www.iosrjournals.org/iosr-jdms/papers/Vol16-issue12/Version-14/D1612142328.pdf>
4. Talati S, Gupta A, Kumar A, Malhotra S, 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. Journal of Postgraduate Medicine. 2015;61(1):3.

ANNEXURE

S.No	Date	Name of the Procedure	Surgeon	Specialty	Scheduled Time	Wheel In	Wheel Out	Duration of Surgery	OT No.	Reason for Delay
------	------	-----------------------	---------	-----------	----------------	----------	-----------	---------------------	--------	------------------