

ROOT-CAUSE ANALYSIS AND COST OF DELAYED HOSPITAL DISCHARGES AND STRATEGIES FOR OPTIMIZATION

Dissertation Submitted to



The IIHMR University, Jaipur

for the partial fulfilment for the award of the degree of

Master of Business Administration (MBA)

in

Hospital and Health Management

By

Seerat Kaur Thind

Under the Supervision and Guidance of

Dr Goutam Sadhu

2024

Date: 22-Jun-2024

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Dr. Seerat Kaur Thind (ID-00063475)** is associated with **Global Health Ltd (GHL), Medanta - The Medicity** since 18-Mar-2024. She is engaged with us as Trainee - Medical Administration & Clinical Operations at the below mentioned official address:-

**Medanta - The Medicity
Global Health Limited,
Sector 38, Gurgaon
Haryana (India) – 122001**

This letter is issued on her specific request to apply for exam purpose.

For Global Health Ltd



Ranshul Aggarwal

Deputy General Manager - Human Resources

Certificate

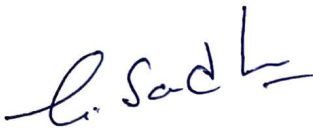
I, hereby declare that this dissertation titled, **“Root Cause Analysis and Cost of Delayed Hospital Discharges and Strategies for Optimization”** is a bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.


Dr. Seerat Kaur Thind

Date 03/07/2024

CERTIFICATE

This is to certify that dissertation titled **“Root-Cause Analysis and Cost of Delayed Discharges and Strategies for Optimization”** is a record of the research work undertaken by in partial fulfilment 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 her approach to the research study has been sincere, scientific, and analytical.

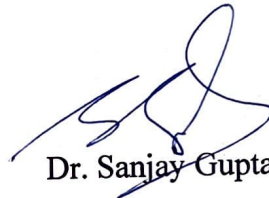


Dr. Goutam Sadhu

Faculty Guide

IIHMR University, Jaipur

Date: 02/07/2024



Dr. Sanjay Gupta

School Dean

IIHMR University, Jaipur

Date: 02/07/2024

Abstract

Background

A delayed discharge process in a hospital setting refers to the situation where a patient, who has been declared ready for discharge clinically and medically by healthcare professionals, continues to occupy a hospital bed beyond the expected discharge date. Delayed discharge, commonly referred to as "bed-blocking," presents a complex and multi-faceted challenge within healthcare systems globally. The repercussions of delayed discharge extend beyond individual patient care, exerting a significant strain on healthcare resources, bed availability, and overall system efficiency, and hence, need to be studied carefully.

Objectives

The primary objective of this study is to identify and analyze the root causes of delay of hospital discharges. While the secondary objectives include identifying and explaining the costs incurred by hospitals due to delay in discharges. It also includes examining existing available literature for understanding and assessing the interventions already being employed, and thus, providing practical solutions to address the identified causes of delay in discharge processes.

Methodology

The study is conducted over a period of three months from March to June 2024, and uses a mixed-methods approach, including qualitative analysis of literature, patient demographics, medical conditions, causes of discharge, and quantitative analysis of hospital administrative data. Tools such as fishbone diagrams and SWOT analysis are used to identify and categorize the root causes of delayed discharges.

Results

This study concluded that the discharge care plan was unplanned for majority of patient admitted during the course of the study. The main cause for delay in discharges found during the study was the pending finalization of the discharge summary which was to be handed over to the patient post-discharge. The study also found that the costs associated with delayed discharges included direct costs such as staffing, utilities, and transportation, as well as indirect costs such as staff time, wastage of resources, loss of reputation, hanging loyalty, and dissatisfaction. There were several strategies that were studied and implemented to optimize the discharge process at the hospital, which included appointing a multi-disciplinary discharge leader and introduction of Red to Green Bed Days with a patient flow bundle, including senior clinician review, inter-disciplinary team rounds, patient flow optimization, etc. These strategies helped the hospital management and staff to smoothen the discharge process and improve patient feedbacks, strengthening the overall system efficiency.

Keywords: Delayed discharge process, bed blocking, root-cause analysis, fishbone diagram, SWOT analysis, discharge planning, discharge summary

Acknowledgement

I, Dr Seerat Kaur Thind, student of MBA Hospital Management first and foremost would like to express my deepest gratitude to the President of my university, Dr. P. R. Sodani for giving me this opportunity to undergo internship and carry out a research dissertation as part of the curriculum. This has been a very enriching and learning experience for me.

I am indebted to my faculty mentor, Dr. Goutam Sadhu for his constant supervision and guidance throughout the study. I am truly grateful for the countless hours he has spent reviewing my drafts, providing constructive criticism, and pushing me to think critically and expand the scope of my research. Dr. Goutam Sadhu's expertise and dedication have been instrumental helping me to overcome the challenges that I faced during the course of this study.

I would also like to thank the Operations Manager at Medanta Hospital, Dr Saurabh Patle for his valuable input and his diverse perspectives have helped me thoroughly with this study. Alongside, I would also like to extend my thanks to the administrative team for providing me with all the necessary data and tools, and for their suggestions and feedback.

I am also highly appreciative of all the participants who have participated in this study and helped to come to a conclusion and result to support my research.

Last but not the least, I would like to thank my family and friends for their unwavering love and support throughout.

Thank you.

Dr Seerat Kaur Thind

Table of contents

CHAPTER 1 INTRODUCTION	Error! Bookmark not defined.
CHAPTER 2 REVIEW OF LITERATURE	Error! Bookmark not defined.
CHAPTER 3 METHODOLOGY	Error! Bookmark not defined.
3.1 Research design	14
3.2 Study setting	14
3.3 Duration	14
3.4 Study population	14
3.5 Research procedures/approaches	15
3.6 Sample size	16
3.7 Sampling technique	16
3.8 Operational definitions	16
3.9 Statistical methods and qualitative methods	17
3.10 Ethical considerations	17
CHAPTER 4 RESULTS	Error! Bookmark not defined.
4.1 Root-Cause Analysis	19
4.2 SWOT Analysis	21
4.3 Pareto Analysis	23
4.4 Planned to Unplanned Discharges	24
4.5 Pending finalization of Discharge summary and its hand-over to the patient	25
4.6 Root-Cause Analysis of delay in discharge summary finalization	26
4.7 Discharge before noon	27
4.8 TAT of the discharge process	27
4.9 Cost Analysis	28
4.9.1 Direct Costs	28
4.9.2 Indirect Costs	29
4.10 Proposed Interventions	30
4.10.1 Appointing a Multi-disciplinary discharge leader	31
4.10.2 Introduction of Red-to-Green Bed Days	33
CHAPTER 5 DISCUSSION	Error! Bookmark not defined.
CHAPTER 6 CONCLUSION AND RECOMMENDATIONS	Error! Bookmark not defined.
REFERENCES	43

List of Abbreviations

DD	Delayed Discharge
DHD	Delayed Hospital Discharge
DS	Discharge Summary
IDT	Inter-Disciplinary Team
IDTR	Inter-Disciplinary Team Rounds
MM	Medanta Medicity
MT	Medical Transcriptionist
RCA	Root-Cause Analysis
SOP	Standard Operating Procedure
SWOT	Strength, Weakness, Opportunity and Threats
TAT	Turn-Around Time

Table of figures

Figure 1: Fishbone or Ishikawa diagram displaying the causes of a delayed discharge	21
Figure 2: Pareto Analysis of the causes of a delayed discharge process.....	24
Figure 3: Ratio of planned to unplanned discharges	25
Figure 4: Main root causes of a delayed discharge process.....	26
Figure 5: Root-Cause Analysis of delay in discharge summary finalization ..	26
Figure 6: Time taken for the discharge process	27
Figure 7: Turnaround Time of the discharge process.....	28
Figure 8: Consequences of a RED Day	34
Figure 9: Consequences of a GREEN Day	34

Chapter 1: Introduction

Medanta Hospital, Gurugram recognizes the pivotal role caregivers play in supporting a patient's recovery after leaving the hospital. As an integral part of their comprehensive discharge planning, the hospital actively engages with patients and their designated caregivers to collaboratively develop a personalized post-hospitalization care plan. The hospital has a robust discharge planning process that prioritizes the unique needs of elderly patients. They work closely with patients and their caregivers to develop a comprehensive discharge plan. This plan addresses the patient's post-hospitalization requirements, such as:

- Medication management - Ensuring the patient understands and can properly take all prescribed medications after leaving the hospital.
- Follow-up appointments - Scheduling any necessary follow-up visits with the patient's primary care physician or specialists.
- Home care support - Arranging for in-home assistance, equipment, or other services the patient may need to safely transition back home.
- In addition to the personalized discharge plan, Medanta also provides detailed discharge instructions to the patient and their family.

Medanta's commitment to supporting the patient's post-hospitalization recovery and well-being is a key part of their patient-centric care model has helped to achieve a holistic approach to discharge planning and coordination.

However, what is most important is how this process of discharge is being carried out at the hospital. The discharge planning team at Medanta takes the time to thoroughly discuss the patient's specific needs and requirements with the caregiver. There needs to be an open dialogue which helps to ensure that manager/staff is fully prepared to take on the responsibilities ahead. To equip the caregiver with the skills and knowledge required, Medanta provides hands-on training in any specialized care techniques the patient may need, such as wound management, feeding tube operation, or proper patient transfer methods. The hospital also offers video resources the caregiver can refer to as a refresher or to learn additional caregiving techniques.

The hospital works closely with the care team to remind them about the unique communication strategies and care techniques required for these patients, who may face challenges like hearing, vision, or orientation problems that make it difficult to absorb standard discharge information.

Medanta helps guarantee the patient's post-hospitalization needs are thoroughly addressed. This collaborative approach also ensures the caregiver is equipped with the necessary knowledge, skills, and support to provide the care and assistance the patient will require once they return home or transition to another care facility. Medanta's commitment to this inclusive discharge planning is a hallmark of their patient-centric care model. However, all

this done on a daily basis keeping in mind the Standard Operating Procedures (SOPs) of the patient discharge process being followed at the hospital. A few of the SOPs relevant to this study are mentioned below:

- According to the hospital policy, all the discharges scheduled on the day must be completed and the bed must be vacated by 12 noon (discharge before noon) of the same day.
- At least 85% of all discharges must be planned one day prior and night billing must be initiated for all planned cases.
- The discharge process TAT must not exceed 240 minutes from the time of announcement of discharge. Ideal TAT must be maintained at 180 minutes.
- All patients undergoing discharge the following day must be counseled (pre-discharge counseling) about the discharge process according to their payment method, approximate duration for discharge process, documentation, and expectations from the attendants of the patient.

These help the hospital staff to streamline discharge process for each patient and carry out discharge in a more efficient manner. However, this issue has not been clearly solved by the healthcare staff at Medanta Hospital, leading to negative feedback due to dissatisfaction with the process from patients and their families. This has become a very necessary and urgent issue which needs to be tackled by the hospital efficiently.

A patient may remain in a hospital bed beyond the expected release date, even though they are deemed medically ready for discharge. This can occur due to various factors, such as the primary doctor being unavailable, delays in referrals or diagnostic tests, or a lack of transportation options for the patient to leave the facility, or lack of home care services. This "bed-blocking" scenario, where a patient no longer requires acute care but is unable to leave the hospital, presents a complex challenge for healthcare systems worldwide.

This dissertation project titled, "Root Cause Analysis and Cost of Delayed Hospital Discharges and Strategies for Optimization" seeks to delve deeply into this critical issue. By conducting an exhaustive examination of the underlying causes of delayed discharges in a hospital environment, this study seeks to provide valuable insights that can inform policy decisions, drive operational improvements, and ultimately enhance patient outcomes while optimizing healthcare resource allocation. The research will commence by conducting a thorough review of the current state of delayed discharge, both locally and within the broader healthcare landscape. Through the collection of relevant data and then followed by its analysis at the target hospital, including patient records, discharge protocols, and resource utilization metrics, the study will strive to gain a nuanced understanding of the factors contributing to delayed discharges. This analysis will encompass an exploration of patient demographics, medical conditions, post-discharge care options, and the coordination among healthcare providers and social services.

Furthermore, this study also proposes evidence-based solutions and strategies to optimize the discharge process, and thus making the care patient-centric. The study aims to provide a comprehensive roadmap for healthcare organizations to address this pressing issue.

Chapter 2: Review of Literature

The review of existing literature consists of the learnings from academic journals, and government reports to attain a comprehensive understanding of the current knowledge. By employing this research methodology, the study aims to understand and reveal the root causes of delayed discharges, identify the associated costs incurred by the hospital, and introduce evidence-based solutions to strengthen the discharge process in the hospital.

Causes and Interventions

The existing research (as tabulated below) has identified the underlying factors that contribute to delayed hospital discharge process in the hospital such as the limited availability of post-discharge care facilities, coordination between hospital staff and providers, insufficient discharge planning processes. To mitigate these root causes, investigators have examined various interventions, including refining discharge planning procedures, strengthening transitional care approaches, and assembling multidisciplinary teams dedicated to facilitating smooth hospital-to-home transitions.

Research Gap

Research void in the existing literature (as tabulated below) is the lack of a holistic investigation that not only qualitatively explores the fundamental reasons behind delayed hospital discharges, but also meticulously assesses the financial repercussions and economic burden associated with this phenomenon. Conducting such a comprehensive study would offer a more complete understanding to healthcare organizations and policy influencers regarding the significance of tackling delayed discharges from both a patient-centric quality of care perspective and a cost-effective, financially sustainable standpoint.

S. No.	AUTHOR	YEAR	TITLE	STUDY LOCATION	SAMPLE SIZE	SAMPLING TECHNIQUE	SALIENT FEATURES
1	Cadel L, Guilcher SJT, Kokorelias KM	2021	Initiatives for improving delayed discharge from hospital setting: a scoping review	University of Toronto, Toronto, Ontario, Canada	66	Purposive sampling	Daily rounds and management focusing on long-stay patients were effective in improving length of stay and bed occupancy (1) Sustained improvements needed support from the quality improvement programs and community team (1) Changing delivery of care for frail elderly persons is feasible (1) Integrated care can reduce hospital and nursing home use, without impacting cost (1) Key features of the model: proactive, restorative, collaborative and integrated, client-centered and cost-effective (1) Effective leadership from hospital administrators contributes to positive outcomes for patients, staff and the economy (1)

2	Micallef A, Buttigieg SC, Tomaselli G, Garg L	2020	Defining Delayed Discharges of Inpatients and Their Impact in Acute Hospital Care: A Scoping Review	University of Malta	64	Purposive sampling	Research uncovered a tendency for the rate of delayed discharges to be particularly due to issues related to overall hospital organization and management (2) A number of problems were identified in this field, ranging from conflicts of interest between health professionals, to procedural delays, mainly pertaining to waiting for tests and investigations, to mere confusion and redundancy in the plan of care (2) Delayed discharges were found to cause severe A&E (Accident & Emergency) overcrowding, and bed-blocking, due to the increased inefficiency and waste that this phenomenon brings with it (2) The lack of proper discharge planning was another factor that we identified as having a negative impact on an effective and timely discharge process, thereby directly resulting in both discharge delays as well
---	---	------	---	---------------------	----	--------------------	---

							as increased re-admission rates (2)
3	S Divya, S Aarthi	2020	A study on causes of delay in discharge process in one of the prominent college, hospitals in Tamil Nadu	Department of Hospital Administration in Dr. N.G.P Arts and Science college, Coimbatore, India		Random sampling	The average time taken for discharge was 6 hours 90 minutes for cash patients and 7 hours 20 minutes for insurance patients (3) 46% of patients were discharges in 6-8 hours, 15% in more than 8 hours, and 8% in 2-4 hours (3) The first cause of discharge delay is discharge planning by the consultant that is done on the day of discharge which delays further process. The consultant may be asked to take rounds for likely discharge patients first and then to others or preplan the discharge on the previous day (3) Almost 74% of patients discharge time takes about more than 4hrs which is not according to prescribed NABH standards (3)
4	Mundoda n JM, Sarala KS,	2019	A study to assess the factors contributing to delay in	1,000-bedded teaching hospital in Kerala	69	Purposive sampling	About two thirds (68.1%) of the patients made their payment by cash, while the remaining were those

	Narendra nath V		discharge process in a teaching hospital				who availed any one type of insurance (4) Major Bottlenecks Identified were: Time taken for summary preparation Time taken for picking the chart from ward for billing Time delay in communication regarding the final bill Final bill settlement Final check out (4) Further break down showed that the maximum delay occurred during time taken for discharge summary completion—and average of more than 4 hours, this was followed by the time taken for bill clearance (4).
5	Bai AD, 2019 Dai C, Gill SS		Risk factors, costs and complications of delayed hospital discharge from internal medicine wards at a Canadian academic medical centre: retrospective	A tertiary care hospital in Canada	4311	Random sampling	Delayed discharge and consequent longer hospital stay were associated with significantly higher hospital costs and more complications in hospitals especially nosocomial infections. (5) The most significant risk factors for delayed

			cohort study				discharge included advanced age, female sex, diagnosis of dementia or diabetes with complication, and referrals to physiotherapy, occupational therapy and speech language pathology (5) A simple clinical prediction rule can identify patients at high risk for delayed discharges. These patients can then be targeted for interventions to facilitate earlier discharges (5) Possible evidence-based interventions included clinical pathways for specific patient groups, early rehabilitation on weekends and early anticipatory interdisciplinary discharge planning (5)
6	Hamid S, Jan FA, Rashid H	2018	Study of discharge process of patients admitted in inpatient department of a tertiary care hospital of north India with a special focus	SKIMS, Jammu & Kashmir, India	710	Random purposive sampling	Observations revealed that the average time taken for discharge process was 240 minutes for those who had a planned discharge and had to pay out of pocket (Self Payment) (6) Average time taken for planned discharges

			on reducing the waiting time				(self-payments) was 278 minutes while it was 302 minutes for those who were discharged against medical advice (DAMA) (6) Studying the patients positive response about time and steps involved in discharge process revealed that most of the patients' relatives were not satisfied about the discharge process including time taken for completion of whole process and felt that discharge process was too lengthy and needs to be fast tracked and simplified (6).
7	Boyd S	2017	Hospital Administrators' Strategies for Reducing Delayed Hospital Discharges and Improving Profitability	Walden University, Minneapolis, USA	3	Purposive sampling	This study identified five unified themes that limit the quality of discharge care: (a) competing levels of importance in the discharge process, (b) inadequate coordination within multidisciplinary discharge teams, (c) lack of standardization in discharge procedures, (d) poor patient and family communication, and (e) lack of post-discharge feedback and clinical responsibility (7). Establishing clear strategies for discharge

							procedures, such as interdisciplinary teamwork, patient communication, and post-discharge continuity of care 29 may contribute to improving the quality of discharge processes (7). The increasing number of discharge delays has an adverse impact on the overall system, resulting in loss of income (7). This study noted three factors that delayed hospital discharges: (a) an improper patient evaluation by physicians, (b) the socioeconomics of patient backgrounds, (c) an unorganized discharge team, and (d) inefficient communication between inpatient and outpatient providers (7).
8	Gaughan J, Gravelle H, Siciliani L	2017	Delayed Discharges and Hospital Type: Evidence from the English NHS	NHA hospitals, England	614	Random Sampling	Specialist hospitals have about a tenth of the delays of Acute Trusts, and Teaching hospitals have 72 per cent more delays (8). Hospital Trusts that have Foundation Trust status have 14–28 per cent fewer bed-days lost due to delayed

						discharge of patients (8). Policymakers may be able to use Foundation Trusts as examples of good practice, which can be identified by on-site investigations of FTs that have a lower-than-expected number of delays (8). After accounting for size, patient characteristics and long-term care availability, we find that although Mental Health Trusts and Acute Trusts have similar delays attributed to the NHS, Mental Health Trusts incur more delays in total (8). Trusts with a higher percentage of patients aged 75+ have more delays (8).
9	Kochar R	2016	Role ofA multispecialty hospital of Ludhiana.	270	Random sampling	In surgery department, time taken for maximum no. of patients, i.e., 29 has been observed between 1-3 hours for final summary, followed by 20 patients between 3-5 hours and 7 below 1 hour (9). In departments such as surgery, medicine,

							gynecology and gastroenterology had 3-5 hours of discharge intimation to final summary time indicating it to be one of the major causes of delayed discharge (9).
10	Hendy P, Patel JH, Kordbach eh T	2012	In-depth analysis of delays to patient discharge: a metropolitan teaching hospital experience	Chelsea and Westminster Hospital, London	83	Purposive sampling	In total, 54 of the 83 patients (65.1%) experienced a delay while waiting for a service. Forty of the 83 (48.2%) patients experienced a delay that extended their discharge date (10). Of the 888 bed days, the number of days affected by a delay ('total delay') was 288 (32.4%). The mean 'total delay' per patient was 3.5 days (median = 0.5) (10).

Chapter 3: Objectives and Methodology

After carrying out the literature review, a quantitative analysis is conducted using hospital administrative data, including patient records, discharge logs, and resource utilization metrics. This data is used to identify patterns, trends, and underlying factors contributing to delayed discharges, such as turnaround time of TPA process, availability of physicians, availability of post-discharge care options, etc. The integration of the quantitative and qualitative data enable a comprehensive understanding of the root causes of delayed discharges and inform the design of evidence-based strategies to optimize the discharge process in hospital settings.

Key Research Question

What are the primary causes of delayed hospital discharges and the associated costs? What evidence-based strategies can be implemented to optimize the discharge process, reduce delays, and improve patient outcomes?

Objectives

This study has various objectives to fulfil, which are as follows:

- To identify and analyze the root causes of delayed hospital discharges, including hospital related, and physician related factors, such as inadequate post-discharge care arrangements, inefficient discharge process communication and awareness, improper time management, etc.
- To recognize various kinds of costs associated with the delayed discharge process.
- To examine the existing interventions and initiatives aimed at reducing delayed discharges and assess their effectiveness in improving discharge efficiency.
- To provide solutions that address the causes of delayed discharges practically with the aim of improving the discharge workflow and enhancing patient care in hospital setting.

For patients, delayed discharges can lead to prolonged hospital stays, which may increase the risk of hospital-acquired infections, reduce independence, and hinder the recovery process. From a healthcare system perspective, delayed discharges contribute to bed shortages, increased healthcare costs, and inefficiencies in resource utilization. It is crucial to address

delayed discharges promptly to ensure timely and appropriate care for patients, optimize hospital resources, and improve overall system efficiency. Thus, a study such as this provides valuable insights for healthcare workers to optimize and to provide quality of care to patients.

To investigate the objectives of this research on "Root Cause Analysis and Cost of Delayed Hospital Discharges and Strategies for Optimization", a combination of quantitative and qualitative research methods is utilized. This includes gathering and analyzing data using both numerical and non-numerical techniques.

Methods of data collection include retrospective analysis of hospital records, prospective determination of frequency, causes, and potential implications by the analysis of hospital records, administrative databases, and electronic medical records.

3.1 Research design

Mix methods study, involving qualitative analysis of the literature to examine the existing evidence, and quantitative analysis of the hospital administrative data, including patient records, discharge logs, and resource utilization metrics.

3.2 Study setting

The study is set at the in-patient department of the 6Th floor, B wing at Medanta, the Medicity, Gurugram

3.3 Duration

The study is done for a period of 3 months, from the month of March to June, 2024.

3.4 Study population

The population to be studied includes all patients who were admitted to the hospital and were declared eligible for discharge from the hospital during the period under study. This population includes patients, who were medically stable and ready for discharge, but experienced delays due to various reasons such as lack of post-acute care availability, administrative issues, or other factors. The study population is a subset of the target population, which is all the patients who are admitted to the hospital during the study period, but the study has focused on those patients who have experienced delayed discharges.

The individuals included in this investigation are selected according to the definition of delayed hospital discharge proposed by the researchers Bryan et al given in the year 2022 (2). This definition encompasses patients who have been deemed medically ready for release from the hospital, but are unable to leave due to the need to coordinate arrangements for their continued care after discharge.

Inclusion criteria:

- Age more than 18 years
- Patients admitted to the 6th floor, B wing in neurology ward of Medanta, the Medicity, Gurugram.
- The patients who experience delayed effective discharge from hospital for non-medical reasons, or delayed discharges due to issues with delayed referrals, insurance, pharmacy, etc.
- Patients/attendants who provide their consent to include their information and data in the research.

Exclusion criteria:

- Patients under the age of 18
- Patients who were brought to the hospital, but directly discharged from emergency department without becoming in-patients.
- Patients who chose to depart the hospital prior to being medically cleared for discharge (DAMA), or against the recommendations of their primary consultants (LAMA).
- Patients with missing data on key variables such as demographics information, or discharge status.
- Patients with certain medical conditions or comorbidities that confound the result or make it difficult to determine the root cause of delayed discharge.
- Patients that are discharged on Sundays.
- Patients who were declared dead during the course of their hospital stay, or were transferred to another facility.

3.5 Research procedures/approaches

- Literature Review:
A comprehensive review was conducted of existing literature on delayed hospital discharges, focusing on root causes, interventions, and strategies for optimization.
- Data Collection:
Data was collected on delayed discharges from the hospital, including patient demographics, medical conditions, length of stay and discharge details.
- Root Cause analysis:
Tools such as fishbone diagrams, SWOT analysis, Pareto analysis were used to identify and categorize the root causes of delayed discharges.
- Strategy development:
Based on the root cause analysis, evidence based strategies were developed for optimizing the discharge process, such as improving communication, enhancing discharge planning, etc.

3.6 Sample size

62 eligible patients, who underwent discharge process during the study period from March to June, 2024 on the 6th floor, B wing of Medanta, the Medicity.

3.7 Sampling technique

A random sampling technique was employed to select patients, who have direct involvement or experience with the discharge process at the hospital. This includes patients and/or their attendants who undergo the discharge process. Such a sampling is appropriate to gather comprehensive data from various stakeholders involved in the discharge process.

3.8 Operational definitions

- **Hospital discharge:**
The formal process of a patient's departure from a hospital following a medical procedure or course of treatment is known as a discharge. This process encompasses the patient's exit from the hospital, which can involve the various scenarios such as returning home after receiving necessary care and treatment, transferring to another facility for continued care and specialized care, or in case of death.
In this study, we only focus on patients who have been discharged from hospital to return home.
- **Delayed Hospital Discharge:**
The duration between when a patient is declared ready for release from the hospital clinically and the time when he/she is actually discharged is referred to as the "delayed discharge" period. This delay exceeds the expected or anticipated duration for the patient's discharge, and it can be attributed to various factors.
- **Bed-blocking:**
Bed-blocking" refers to a situation where a hospital bed is occupied by a patient who is medically ready to be discharged, but their discharge process is delayed due to various non-medical factors. In this scenario, the patient no longer requires the level of care provided in the hospital setting, yet they continue to occupy the bed due to the delayed discharge.
- **Root Cause Analysis:**
A systematic examination of the underlying causes of delayed hospital discharges, focusing on identifying the primary factors contributing to delays in the discharge processes.
- **SWOT analysis:**
A strategic analysis framework employed to pinpoint and assess the organization's internal assets and limitations, as well as external favorable circumstances and unfavorable factors, in the context of a particular research study.
- **Pareto analysis:**

Pareto analysis is a decision support tool that applies the Pareto principle, colloquially referred to as the 80/20 rule. This principle posits that a disproportionately large percentage of the results or impacts, typically around 80%, are habitually generated by a relatively small fraction of the contributing factors or root causes, often estimated at 20%.

- **Cost of delayed hospital discharge process:**
Cost of delayed hospital discharge process includes the financial and non-financial implications of delayed discharge process on the patients and the organization.
- **Strategies for Optimization:**
Practical and evidence-based strategies aimed at mitigating delayed hospital discharges by tackling the identified root causes, optimizing patient flow, and enhancing the overall effectiveness of hospital discharge processes.

3.9 Statistical methods and qualitative methods

- **Content Analysis:** Analysis of hospital policies, procedures, and documentation to identify potential root causes of delayed discharges.
- **Fishbone Diagrams:** In order to conduct the root cause analysis, a fishbone diagram was utilized, also referred to as an Ishikawa diagram. This strategic tool was employed methodically categorize and provide a detailed, diagrammatic depiction of all potential causes and their underlying root factors.
- **SWOT analysis:** The SWOT analysis was done to systematically identify, understand and analyze the internal strengths and weaknesses, along with the external opportunities and threats that can influence the outcome of this study, such as portraying how the delayed discharge process is problematic within a hospital setting.
- **Pareto analysis or the 80/20 rule:** This rule helps to identify the most significant factors causing delays in hospital discharges by segmenting the issues, and their causes, and then focusing on the most serious ones.

3.10 Ethical considerations

The ethical framework proposed for this study includes the following key considerations:

- **Informed consent:** Patients or their attendants were obtained informed consent for participation in the study. This process consists of explaining comprehensively the purpose and outcomes of the study to them and informing the implications that are present for patient's care and outcomes.
- **Privacy and Confidentiality of all participants:** The data collected was anonymized and kept securely to protect the privacy and confidentiality of patients/attendants.
- **Collaboration and coordination with the hospital staff:** The collaboration with the hospital personnel ensures that the study will be integrated into the operations of the hospital and also provides assurance that any potential disruptions of patient care can be minimized.

- Compliance to hospital protocols, policies, and regulations: The study adhered to all the protocols, policies, and regulations of the hospital.
- Accountability: The research must focus on transparency from its operations through the conduct and findings, documenting all the methods and procedures to be employed. This enables accountability and the scrutiny of peers and regulatory bodies.
- Cultural/religious sensitivity: The study will be sensitive to cultural differences and the variations in health practices that guarantee inclusivity and effectiveness across different populations.

Chapter 4: Results

In this study titled, "Root Cause Analysis and Cost of Delayed Hospital Discharges and Strategies for Optimization", various findings were observed.

4.1 Root-Cause Analysis

Firstly, to carry out the root cause analysis, a fishbone diagram was used. Fishbone diagram is also referred to as an Ishikawa diagram. This analysis tool was used to systematically categorize and provide a detailed visual representation of all the potential causal factors and their underlying root factors.

In the figure 1 below, the problem or effect being examined is the delay in discharge process of patients from the hospital, and this is represented by the "head" of the fish in the fishbone diagram. The identified potential causes of the delay in discharge process were then further categorized and then represented by the "bones" branching off from the main body of the fish. For each of these categories of the root causes were further segmented and listed as the "sub-branches". The figure 1 clearly depicts a structured diagram, which allows for a comprehensive understanding of the various factors that contribute to the delayed discharge issue. By breaking down the problem into its potential causes and further root causes, the fishbone diagram in figure 1 provides an organized visual representation to facilitate an in-depth analysis.

The use of the fishbone or Ishikawa diagram (refer figure 1) enables the hospital to systematically investigate the complex web of causes underlying the delayed discharge problem, ultimately helping to uncover the fundamental root causes that need to be addressed.

The potential causes or "bones", along with their root-causes or "sub-branches" identified during the study are listed as follows:

Doctor:

- **Unplanned discharge care plan:** The doctor plays a crucial role in unplanned discharge care planning, ensuring timely and safe transitions by coordinating with other healthcare providers, addressing patient concerns, and providing necessary guidance and support through pre-discharge counseling. This was not followed efficiently for all types of patients.
- **Discharge summary pending:** A delay in discharge summary finalization by the doctor's team can delay the entire discharge process by diverting resources and

causing inefficiencies. This was a very prominent cause of overall delay in the discharge process.

- **Irregularity of doctor's rounds:** The rounds were scheduled irregularly leaving the patients/attendants anxious. The discharge announcement was also made at the last-minute, due to which the process became inefficient.

Patient:

- **Patient education:** The lack of awareness about the estimated date of discharge, and/or the clinical criteria for discharge decreased patient/attendant cooperation during the discharge process.
- **Financial barriers:** The barriers to discharge such as financial, language, transportation issues, led to delay in the overall discharge process.

Management:

- **Equipment related:** Server breakdown or issues of the Hospital Information System (HIS) led to some amount of delay in the overall discharge process.
- **Manpower related:** Poor coordination among departments was seen as a major cause of delay in discharges. Ineffective communication, staff burnout, etc. resulted in delay.

Process:

- **Billing related:** Billing activity was observed to have been sent incorrectly or incomplete at various occasions. Cancellation of billing activity consumed an enormous amount of time as well, resulting in delay.
- **TPA related:** Approval of insurance by the TPA department at the hospital due to incomplete documentation, missing demographics, or doctor's approval resulted in delay in discharges.
- **Medicine related:** The medicine return was not done on time, or errors during indenting last minute after discharge announcement also led to delay in discharge process.

The diagram (refer to figure 1) has proved useful and efficient in categorizing and understanding the root causes of delayed discharge process in the hospital. It provides a clear, structured, and comprehensive overview of the key factors contributing to the delay in discharge process. It has further proved effective to strategize and implement these strategies accordingly and get fruitful results in improving and streamlining the discharge process.

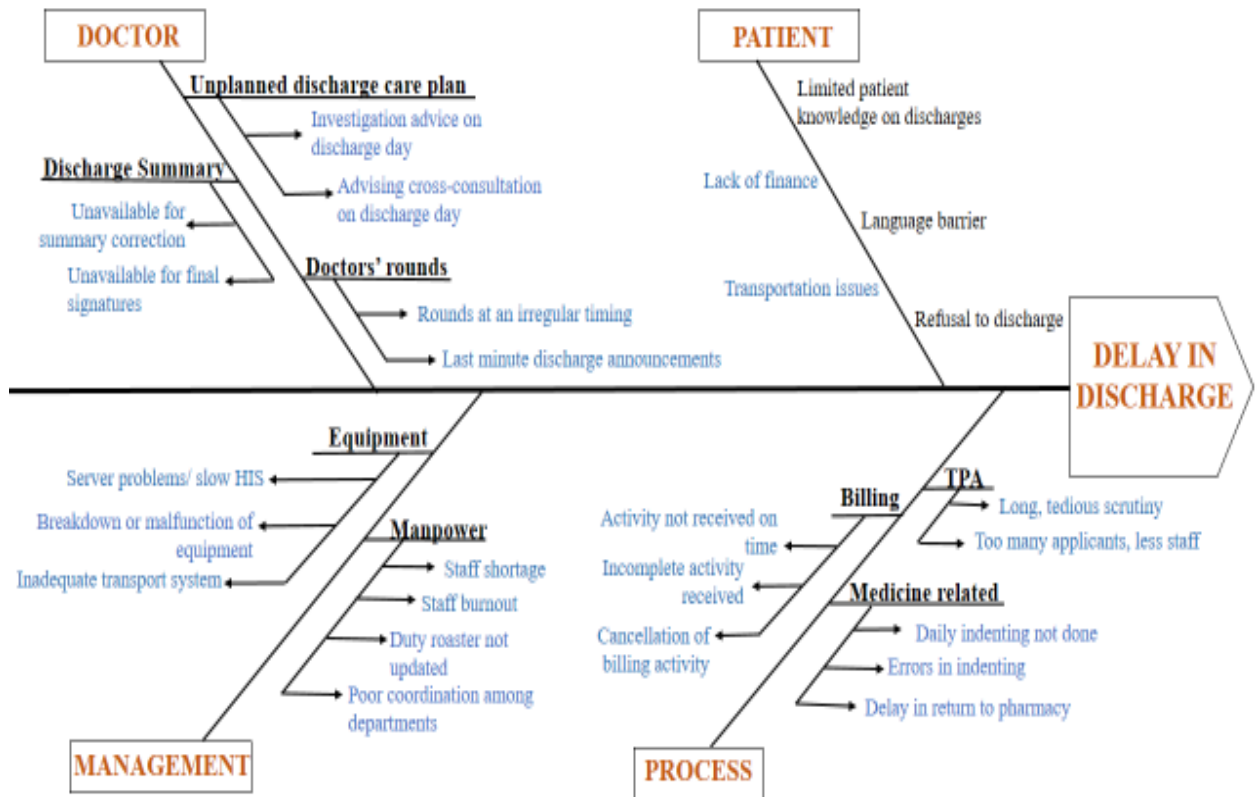


Figure 1: *Fishbone or Ishikawa diagram displaying the causes of a delayed discharge*

4.2 SWOT Analysis

Secondly, a SWOT analysis was carried out. A SWOT analysis is a strategic planning framework that examines the strengths, weaknesses, opportunities and threats of a particular situation or initiative. The fundamental aim of undertaking a SWOT analysis is to methodically identify, apprehend, and scrutinize the internal assets and limitations as well as the external favorable circumstances and unfavorable factors that have the potential to influence the success of a particular endeavor, such as optimizing the delayed discharge process within a healthcare facility.

The key findings from the SWOT analysis are:

Strengths

- Daily Interdisciplinary Team meetings
- Discharge before noon
- Commitment to quality and safe patient care
- Live discharge dashboard for interdisciplinary coordination

Weaknesses

- Decreased patient satisfaction related to discharge process
- Issues in management of manpower and equipment, such as poor coordination among staff of different departments, staff shortage and burnout, inadequate transportation system, etc.
- Consultant and team related inefficiency, such as unplanned discharge care plan, delay in finalization of discharge summaries, etc.
- Inefficient processes such as delay in written discharge orders or unclear discharge plans.
- Lack of communication and coordination between interdisciplinary team members

Opportunities

- Streamlining of processes
- Customer loyalty and retention
- Enhancement in communication between interdisciplinary teams

Threats

- Organizational issues: such as structural complexity and uncertainty, can contribute to delays in the discharge process.
- Clinical factors: A patient's medical condition upon admission is not a reliable predictor of delayed discharge. The root causes of these delays more likely stem from organizational and social issues rather than clinical factors.
- Resource misplacement: Delayed discharge can lead to resource misplacement, resulting in increased costs and poor performance.

4.3 Pareto Analysis

The Pareto principle suggests that a significant portion of outcomes are driven by a small subset of factors. Pareto analysis leverages the concept to identify the "vital few" factors with the most significant impact, allowing you to focus your efforts for maximum efficiency.

On conducting a Pareto analysis for this study by keeping in account the major causes as enlisted in the Fishbone diagram, it was observed that the main cause of delay for patients was the pending discharge summary finalization by the consultant or his/her team (refer figure 2 below).

Pending discharge summary finalization

As graphically shown, in figure 2, the main culprit that caused delay to the process of discharging from the hospital was the incomplete discharge summary. This, therefore, underlines the importance of finalizing the summary at the right time for the smooth transition of patients from the hospital to their respective care settings or even homes.

The preparation of the discharge summary is primarily done by the Medical Transcriptionist (MT) at each floor. The MT himself/herself does primary draft preparation by referring to the medical history and current medical records, investigations, tests, doctor's notes, nursing notes, etc. This primary draft is then given to the doctor or his team for evaluation and correction. This was delaying the finalization of the summaries by the doctor/team to such an extent that the greatest amount of discontinuance, i.e. 35 to 75%, were pending because discharge summaries were yet to be handed over to the patients due to the non-availability of the doctor/team to sign the final discharge summary. This led to a string of after-effects, which are as follows -

- Due distraction of resources from its usefulness in the hospital.
- It distracted staff's focus from efficiently doing discharges, further delaying the process.
- It disrupted the efficiency in communication that was supposed to occur between hospital and primary care providers; appropriate gaps in patient care and, often, readmissions occurred.
- This also added to negative patient feedback. The patient was gravely dissatisfied and angry over a tedious discharge process.

The causes of delay which followed in the analysis were patient awaiting radiology reports (up to 25%), delay in insurance approval by the TPA department (almost 30%), pending referral or investigations to be done for the patient (up to 50%), etc. as stated in figure 2 below.

It was thus seen through Pareto analysis that 80% of the delay in discharge process was caused due to pending discharge summary finalization by the consultant or his/her team as clearly stated in the figure 2 present below.

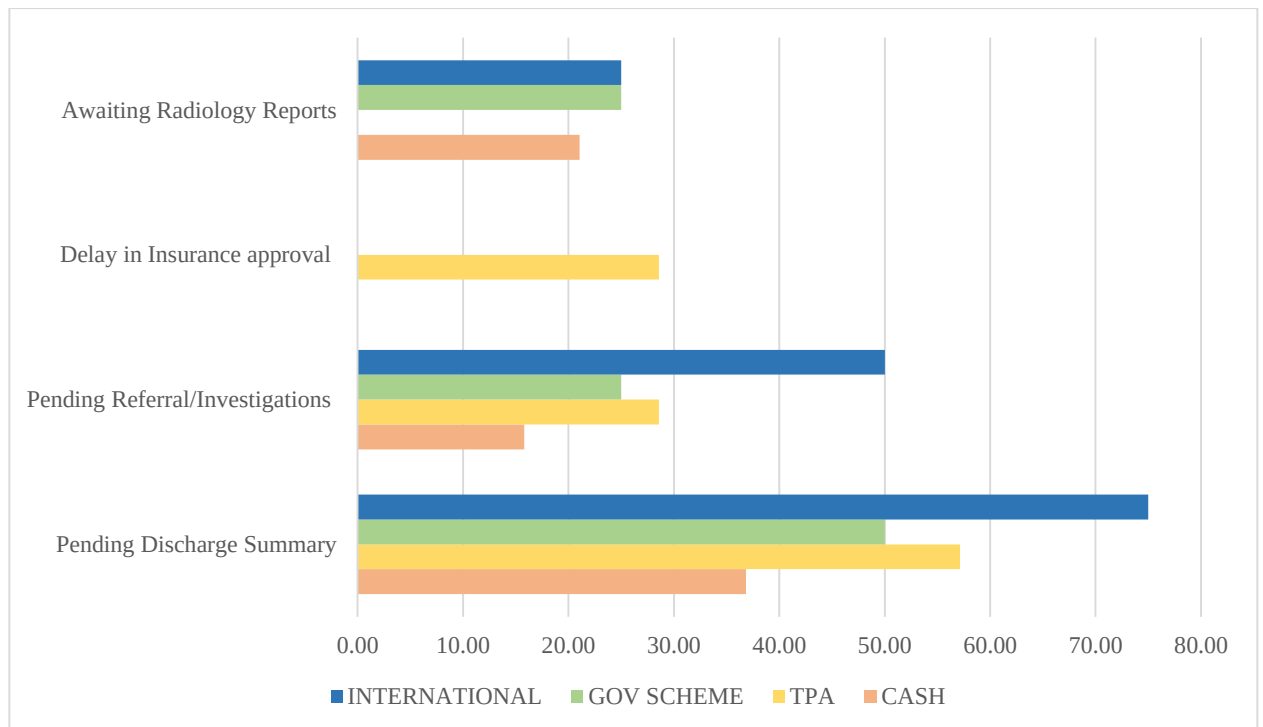


Figure 2: Pareto Analysis of the causes of a delayed discharge process

4.4 Planned to Unplanned Discharges

The planned to unplanned discharge type ratio is an important factor in understanding the causes of delayed discharges. Planned discharges are those that are scheduled and planned in advance, while unplanned discharges are those that occur unexpectedly.

In this study, it was found that the planned to unplanned discharge type ratio was 1:3, indicating that three unplanned discharges were delayed for every one planned discharge (refer to figure 3). The RCA of delayed discharges had also identified lack of discharge planning, leading to lack of bed availability as the top contributing factor for delayed discharge process. The potential ramifications of unplanned or premature patient discharges from the hospital can be quite severe.

The figure 3 present below sheds light on the distribution of planned and unplanned discharges in the hospital. It clearly shows that the proportion of unplanned discharges is way more than the planned discharges being announced for patients during the course of

their study. This shows a clear gap in the compliance to hospital protocols, and policies of the hospital.

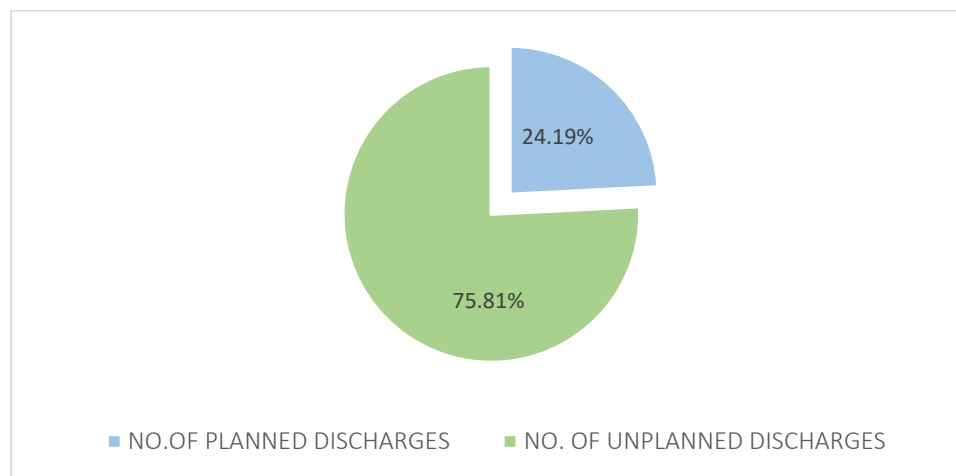


Figure 3: Ratio of planned to unplanned discharges (N=62)

4.5 Pending finalization of Discharge summary and its hand-over to the patient

A discharge summary is a clinical document that summarizes all the information regarding a patient's stay in the hospital, their current condition, the treatment undergone, and the follow-up care plan. It is actually written by the treating practitioner—a physician or a nurse—who supervises the progress of the patient and shares it with other health professionals for communication purposes to avoid a lapse in aftercare.

It was found during the study that main reason for a delayed discharge process was a pending or delayed finalization of the discharge summary as shown in figure 4 below. Almost 40 % were the cases delayed because of pending finalization of the discharge summary. As it is well known, discharge summary finalisation involves many steps until its handover to the patient. The graph below refers to figure 4 takes the delay in handover to patient on his/ her discharge into account.

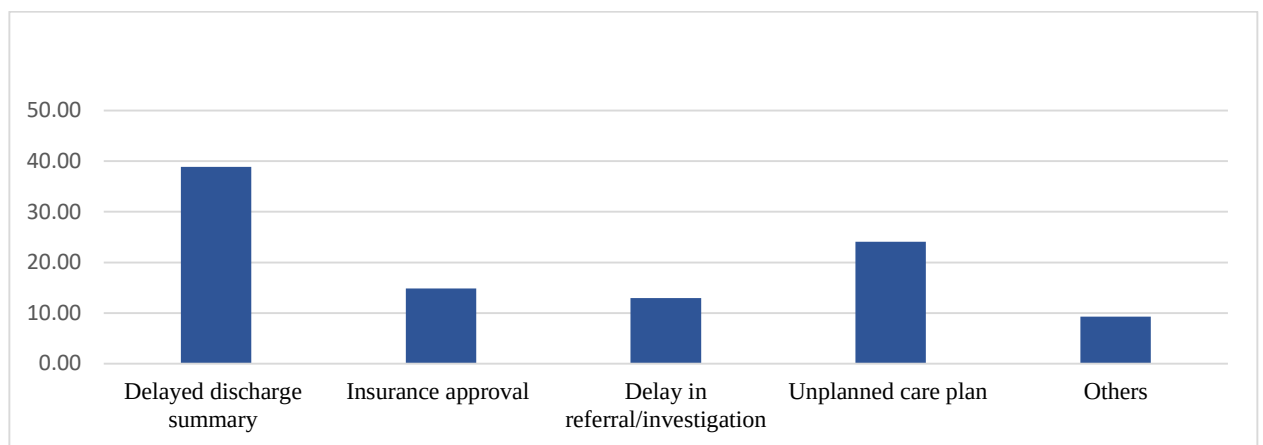


Figure 4: Main root causes of a delayed discharge process

4.6 Root-Cause Analysis of delay in discharge summary finalization

The delay in discharge summary finalization was further analyzed to understand the root factor behind the delay. The reason for this delay in finalization was found to be that the doctor and/or his/her team were unavailable (because of attending to other newly admitted or more vulnerable patients) at the time after discharge announcement to sign off the summary and allow a smooth hand-over to patient.

It was found that almost 90% of discharge summaries were not finalized due to doctor and/or his/her team (as depicted in the figure 5 below). The medical transcriptionist is the one present at the ward to prepare the primary draft of the discharge summary (refer figure 5). It was seen that less than 10% of MTs were responsible for causing a delay in preparation of the DS to the doctor and/or his/her team due to their specific reasons.

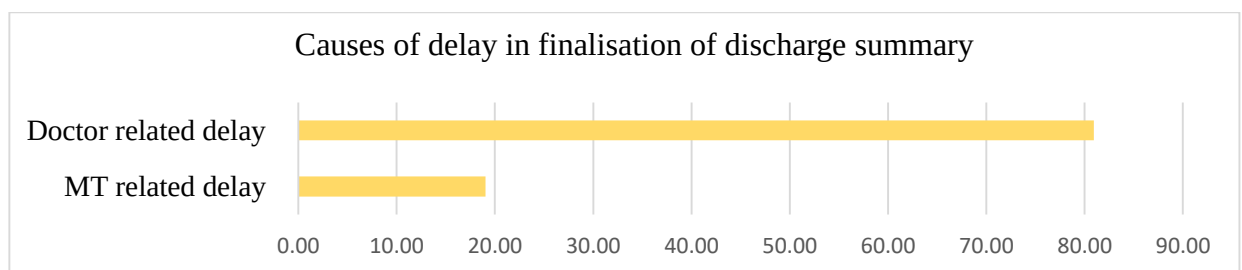


Figure 5: Root-Cause Analysis of delay in discharge summary finalization

4.7 Discharge before noon

According to the hospital policy, the discharges scheduled on the day must be completed and the bed must be vacated by 12 noon (discharge before noon). During the study, it was observed that a discharge before noon was only possible for patients who had a planned discharge, as compared to those with unplanned discharges. The time for discharges during the period under study ranged from 12 noon to exceeding as much as 7 pm in the evening. While most of the discharges took longer than 12 noon for completion, there were also many discharges that exceeded 1 pm as well.

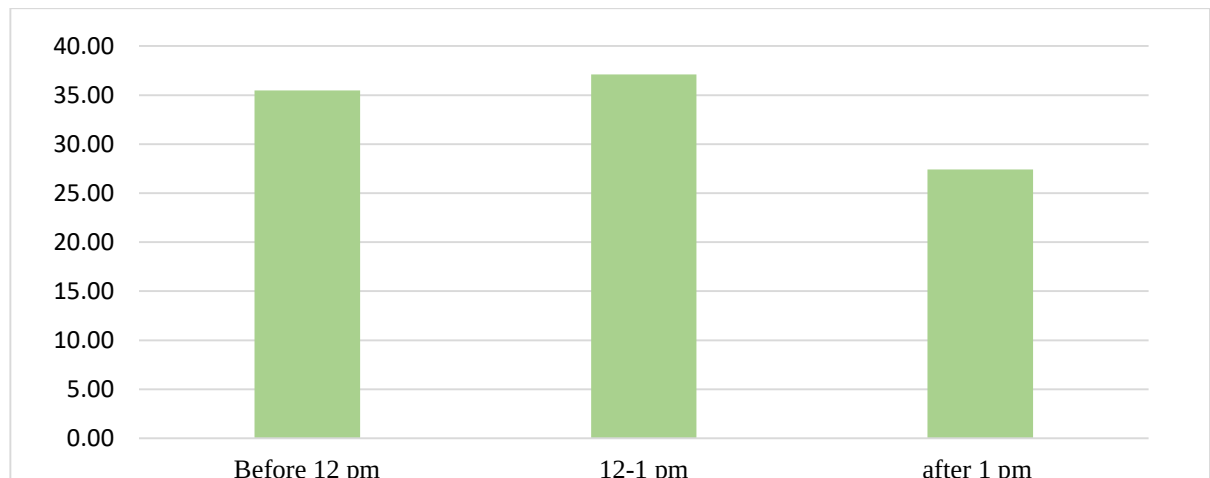


Figure 6: Time taken for the discharge process

4.8 TAT of the discharge process

According to NABH standards, the turn-around time for the hospital discharge process should be up to 180 minutes (3 hours), regardless of the patient's payment mode or insurance coverage. This standardized timeline ensures consistency and efficiency in patient discharge procedures across different payment scenarios.

The figure 7 depicted below shows that the TAT according to NABH guidelines was not being followed for the discharge process in the hospital. The TAT for a discharge process as observed during the period under study revealed that majority of discharges (up to 60%) had a TAT for more than 4 hours, going up to 6 hours. There were some discharges the TAT for which even went up to 8 hours and beyond for a handful in a month.

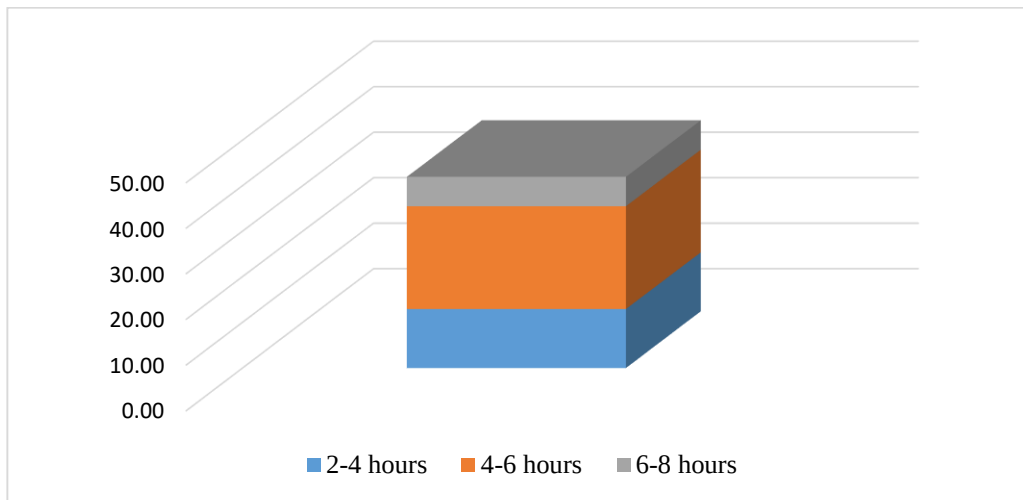


Figure 7: Turnaround Time of the discharge process

4.9 Cost Analysis

Timely hospital discharges are crucial for several reasons. The main reasons include reducing hospital bed occupancy and overcrowding. Delayed discharges lead to a backlog of patients waiting for beds, etc. This negatively impacts the ability to admit new patients and deliver healthcare effectively. Secondly, delayed discharges also lead to negative patient outcomes. Prolonged hospital stays are associated with increased rates of complications and can lead to a loss of independence for patients, particularly the vulnerable. Thirdly, the healthcare costs can go up resulting in financial losses. Thus, improving the discharge process can be a win-win for both the patient as well as the hospital.

The significant financial burden due to delayed discharge process can be improved by using cost-cutting strategies help maintain financial stability and ensure long-term sustainability.

The various kinds of costs that were identified during this study are listed below:

4.9.1 Direct Costs

This would translate into direct costs, say the time spent by the medical staff on the discharge of a patient or medicine given to a patient at the time of discharge. In each of these cases, this cost would directly relate to the individual patient and hence looked into by the hospital with an objective to learn and reduce such costs of delayed discharge. Delayed discharges from hospital have a significant cost related to it. These measured costs in this study have been identified as below;

- The hospitalization costs

The cost for extended and raised length of stay that also included the per-day cost of in-patient care, staff time and consumption of resources provided by the hospitals. These include the staff time to set up packages of care, the over-expenditures due to extended length of stay, which also included cancellation of elective operations, etc. The direct costs of the hospitals also included the costs due to inefficient operations. Those operational inefficiencies thus translated into extra cost, which, again could be related to the performance challenges facing this hospital. The cost of extra days spent in the hospital was not borne by the patient alone but by the hospital also.

- The cost of inefficient staffing

In this, the cost of extra staff that needed to be called in to handle the delayed discharges, such as locum and relief staff is considered. Delayed discharges caused an increase in costs for hospitals due to overtime extra staff that was incurred to handle the backlogging of patients. The overtime contributed to burnout among the staff. This also had hospital staff working overtime to handle the increased workload, therefore incurring higher labor costs. Prolonged periods of understaffing and high workloads led to staff burn-out, further exaggerating the challenge of staffing, which increases turnover rates.

- Rehab beds is where the cost has come from

This is the extra burden on hospitals' budgets, which is caused by insufficient rehabilitation beds forcing hospitals to keep the patients at the facility for a longer time during the recovery period. Many negative implications ensued from this situation. The key negative implications pointed out were reduced bed availability, causing delays in admissions of new patients and affecting the hospital's ability to deliver the services timely. This also led to less satisfaction among patients due to the lack of necessary care and services. This adversely affected the patient outcomes and might also have led to decreased patient loyalty and referrals.

- Opportunity Costs

These included the costs of time spent on managing delayed discharges. This is an opportunity cost, and actually seen in this study to divert resources from other important clinical and administrative tasks. This created a ripple effect in the hospital, such as delaying admission of new patients or causing delay in giving timely care to existing patients.

This only serves to underscore that direct costs associated with delayed discharges contribute to a large financial burden on health providers and the wider system, highlighting the need for effective strategies aimed at reducing such delays and improving overall operational efficiency. In this respect, monitoring identifiable expenses can assist hospitals in better understanding how to optimize the discharge process, reduce unnecessary costs, and contribute toward improved financial sustainability of healthcare services.

4.9.2 Indirect Costs

In the context of a delayed hospital discharge process, indirect costs would majorly include the negative feedback from patients, hanging reputation of the hospital, etc. These indirect

costs cannot be easily attributed to a specific patient's discharge, as they provide benefits across various hospital operations. In contrast to direct costs, which can be directly traced to a patient's discharge, indirect costs are more general in nature and are shared across multiple patients and hospital activities.

Indirect costs, such as the cost of cancelled operations, staff time spent arranging care package, and other activities, are some of the examples of indirect costs related to delay in discharge process.

- Reduced quality of care

Reduced quality of care is an indirect cost related to delayed discharges because it can lead to a range of negative outcomes that ultimately impact the patient's health and well-being. This had several negative outcomes, such as increased risk of complications, increased length of stay, increased risk of re-admissions, eventually leading to patient dissatisfaction.

- Decreased patient satisfaction

This is an indirect cost related to delayed discharge because it can lead to a range of negative outcomes that ultimately impact the hospital's financial performance. The negative consequences observed under this study for the hospital due to decreased patient satisfaction included reduced patient loyalty leading to a loss of revenue. Dissatisfied patients were more likely to share their negative experiences online, which harmed hospital's reputation and deterred potential patients from choosing the hospital for their care.

- Increased Length of Stay (LOS)

Increased Length of Stay (LOS) is a significant consequence of delayed discharge processes. When patients are delayed in discharge, they are often forced to stay in the hospital for longer periods, which can lead to several negative outcomes. The costs of all kinds are increased, such as cost of staffing, supply, utility, transportation, administrative, and specialized care.

4.10 Proposed Interventions

For investigation and application of interventions for improving and streamlining the discharge process, the existing literature was studied and analyzed. It was then found that most interventions included the following:

1. Reducing administrative burdens:
 - Minimizing time-consuming paperwork and simplifying the capture of essential patient information using standardized forms.
 - Eliminating unnecessary assessments that do not directly contribute to discharge planning.
2. Enhancing communication and coordination:
 - Implementing structured, multidisciplinary team meetings to regularly view patient progress and address potential delays.

- Leveraging technology to facilitate seamless information exchange between hospitals, post-acute care facilities, and other providers involved in the patient's care.
 - Promoting early intervention and centralized visual collaboration among the care team.
3. Engaging patients and supporting transitions:
- Utilizing secure communication platforms and remote monitoring to enable ongoing patient and caregiver engagement.
 - Providing comprehensive patient education and equipping patients with the knowledge and tools to actively participate in their care and self-management.
 - Implementing targeted programs focused on medication reconciliation, care coordination and post-discharge follow-up.
4. Harnessing data and technology:
- Leveraging automated discharge planning software and tools to assess complete patient information and support informed decision making.
 - Generating and sharing electronic discharge summaries and care plans in a timely manner to ensure all stakeholders have access to the most up-to-date information.
 - Analyzing comprehensive data on discharge process to identify areas for improvement and drive continuous quality enhancement effort.

4.10.1 Appointing a Multi-disciplinary discharge leader

A multidisciplinary discharge leader is a senior professional who plays a pivotal role in the discharge planning process within a hospital setting. The Discharge Leader is responsible for enhancing the discharge planning process, and ensure the effectiveness. The leader must have the necessary authority to implement changes, also allowing collaboration among all healthcare professionals, including nurses, doctors, managers and other specialists.

Eligibility:

- A multi-disciplinary discharge leader could be a doctor, or a head nurse, depending on their inter-personal skills of communication and decision-making.
- He/she must also possess a multidisciplinary perspective, in a way that he/she has an understanding of the roles and responsibilities of each discipline involved in the discharge process.
- Technical skills are a must for a discharge leader. He/she must have the accurate knowledge of the healthcare systems, policies, and procedure, and should have a clear understanding of the patient care pathways, and the discharge planning processes.
- Overall, the discharge leader must have a patient-centric focus and carry out his/her role as a discharge leader as a priority, and not as a secondary responsibility.

Responsibilities:

- PRE-DISCHARGE COUNSELING is the main responsibility of a discharge leader.
It was observed during the study that majority of patients were unaware of the clinical criteria of discharge, estimated date of discharge, and the overall discharge process of the hospital. Thus, it was inferred that if this is taken care of, then the patient/attendant will be able to tackle the barriers to discharge in a better manner.
- To finalize patients eligible for Night Billing on the previous evening itself.
- To proof read and finalize the discharge summary at least 2 hours prior to discharge time (on completion of 24 hours).
- To coordinate the discharge work flow with the floor manager and the ward secretary on billing activities, etc.
- To direct the TL of nursing to explain the discharge summary to the patient/attendant
- To keep a track of all patients' EDD, and to communicate the same to the patient and family
- To counsel and inform the patient and family on the patient's clinical criteria for discharge.

How did the introduction of a Multi-Disciplinary Discharge Leader help?

- ✓ Refining of discharge process
The leader helped to streamline and refine the discharge process by making it more effective and efficient. This involved collaboration among various healthcare professionals, including nurses, doctors, and other specialists.
- ✓ Improving communication and coordination
The leader was able to improve communication and coordination amongst team members by establishing clear roles and responsibilities, setting expectations of communication, and redefining the culture around discharges.
- ✓ Addressing barriers to discharge
The leader was able to identify the concealed hurdles that came along the discharge process, which were otherwise hidden due to their complex nature.
- ✓ Provision of a personalized and planned discharge care plan
In this study, it was observed that almost 85% of all discharges were unplanned. The leader focused on the discharges personally without interference, thus, planning of more number of discharges was done.

4.10.2 Introduction of Red-to-Green Bed Days

The Red to Green Bed Days system is a visual management tool used in hospitals to identify and address delays in a patient's hospital stay.

A "Red Day" indicated a day when the patient only receives routine, non-acute care with no significant progress made towards discharge.

Conversely, a "Green Day" signifies a day when the planned care, such as tests, treatments, or meeting discharge criteria was successfully completed.

This system helps hospitals to track patient progress and pinpoint areas for improvement to facilitate timely discharges.

The goal is to minimize "red days" and maximize "green days" to improve patient flow and reduce unnecessary hospital stays. This is achieved through:

- Daily multidisciplinary board rounds to review each patient's status and plan next steps.
- Setting an expected date of discharge and clinical criteria for discharge at admission.
- Identifying and addressing barriers to progress, either within the hospital or in arranging post-discharge care.
- Improving communication and coordination among the care team.
- Using visual management tools like whiteboards to track each patient's status.

By focusing in reducing non-value added time in the hospital, the Red to Green Bed Days approach aims to improve patient experience, increase hospital efficiency, and free up bed capacity. The consequences both positive and negative are shown clearly for this tool in the figures 8 and 9 present below.

RED DAY

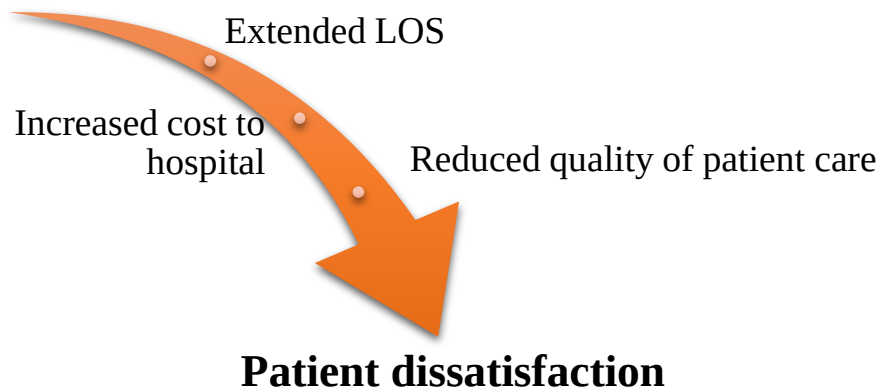


Figure 8: Consequences of a RED Day

GREEN DAY

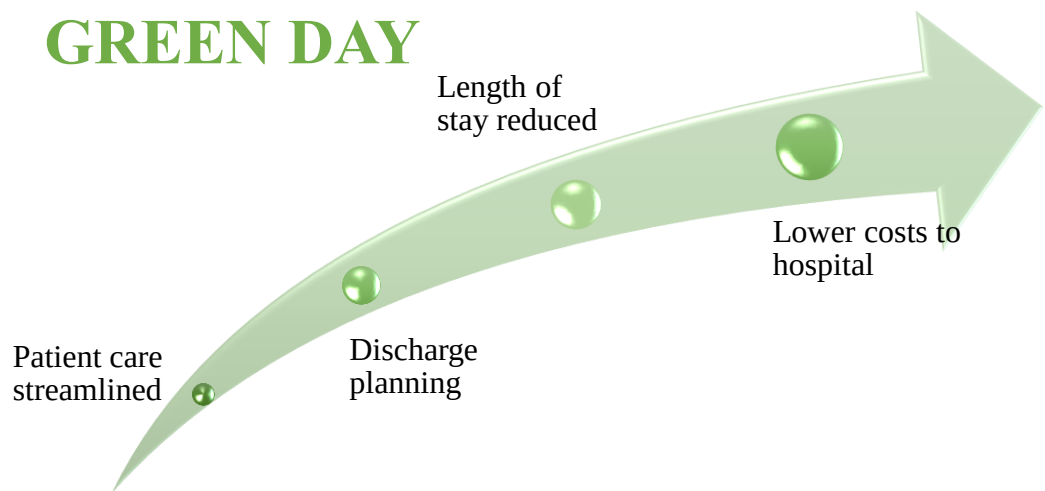


Figure 9: Consequences of a GREEN Day

Red to Green bed days was implemented with a patient flow bundle for more effective results.

The Patient Flow Bundle is a comprehensive set of best practices for managing patient flow in in-patient wards. The bundle employed in this research study blends 5 key elements:

- Senior Clinician Review: Ensuring senior clinicians review patients before midday.
- Expected Discharge Planning: Defining an anticipated date of discharge from hospital, and also setting a clear criteria for discharge clinically is a crucial strategy that enables hospitals to plan and coordinate the discharge process more effectively for all patients, ensuring they are transitioned out of the hospital at the appropriate time based on their clinical progress and readiness.
- Patient Flow Optimization: Facilitating the smooth flow of patients out of the hospital at the earliest opportunity to create capacity for new admissions.
- Early Discharge Prioritization: Prioritizing early discharges before midday.
- Multidisciplinary review: Conducting multidisciplinary team reviews for patients with a length of stay greater than seven days.

This helped in several ways to reduce hospital costs and improve efficiency. The improvements after the introduction are listed as follows:

- ✓ Identifying and addressing delays in patient care
- ✓ Improving patient flow by streamlining of process after identification of gaps
- ✓ Patient knowledge and awareness increased gradually, due to focus on the SAFER patient flow bundle
- ✓ Accountability was provided through this system, helping in recognizing areas of improvement
- ✓ The patient/attendant were clearly able to answer the following:
 - *Why am I admitted to the hospital?*
 - *What is going to happen to me today, while I am in the hospital?*
 - *When can I expect to go home?*
 - *What needs to happen for me to get home?*

Chapter 5: Discussion

Delayed discharge is a significant issue in hospitals, leading to increased costs, longer lengths of stay, and decreased patient satisfaction. This study titled, “Root Cause Analysis and Cost of Delayed Hospital Discharges and Strategies for Optimization” aimed to identify the root causes of delayed discharge and estimate the associated costs in a hospital setting. This study not only examined the factors contributing to delayed discharges but also developed and recommended practical strategies to optimize and streamline the hospital discharge process, with the aim of enabling more efficient patient flow, reducing unnecessary delays, and delivering more effective and timely healthcare services.

The study began with a review of the existing available literature. The literature review examined several studies that explored the issue of delayed discharges in hospital settings. The existing literature offered insights on the discharge process, the potential causes of delay in discharge process, the costs and the kinds of costs associated with the delay, the repercussions of this delay on the patient, management, etc. The key findings indicated that the causes of delayed discharges are multifaceted, including issues related to overall organization and management, conflicts of interest between healthcare professionals, procedural delays, lack of proper discharge planning, and the timing of consultant discharge planning (2) (4). This study titled “Root Cause Analysis and Cost of Delayed Hospital Discharges and Strategies for Optimization” also shows that the root causes of delayed discharges are multifaceted, the major ones being doctor or consultant related (such as pending discharge summary, irregular doctor’s rounds, etc.), hence, such a finding is common.

The existing body of research has made significant strides in uncovering the various root causes contributing to delayed discharges. Available studies have identified issues such as limited availability of facilities, inefficient communication and coordination between hospital staff and providers, and inadequate discharge planning as important causal factors behind discharge delays.

The studies reviewed also highlighted the significant impact of delayed discharges, such as prolonged hospital stays resulting in higher expenses and increased risk of nosocomial infections, with primary risk factors including advanced age, female gender, certain diagnosis, and referrals to various therapies (5). To address these challenges, the literature suggests potential mitigation strategies, such as consultants prioritizing rounds for patients likely to be discharged first, pre-planning discharges, and developing a clinical prediction model to identify high-risk patients who could benefit from targeted interventions designed to facilitate earlier and more efficient hospital discharges, thereby optimizing patient flow and resource utilization (1). The review underscores the need for a comprehensive approach to address the complex factors contributing to delayed discharges and mitigate their negative consequences (3) (9). While our study “Root Cause Analysis and Cost of Delayed Hospital

Discharges and Strategies for Optimization” also highlighted that the challenges of delayed discharge process ranged from those affecting the patient to the hospital management as well. The various challenges found during the course of study were stress, anxiety among patients to financial implications borne by the hospital.

The literature review examined numerous practices that reduced delayed hospital discharges, improving overall patient outcomes. One such major study by Boyd et al., conducted in 2022, identified five themes that critically limit the quality of discharge care: poor coordination amongst the discharge team members, poor standardization of processes, poor communication with the patient/family, poor post-discharge coordination and feedback, and clinical responsibility. The study suggested that clear strategies focused on interdisciplinary collaboration, patient communication, and proper post-discharge continuity of care held the key to improving the quality and effectiveness of hospital discharge processes [7]. Many other key factors related to the delayed discharge of patients from the hospital, such as insufficient counseling by doctors about the patients, socio-economic barriers from the part of patients' side, discharge team's non-cooperation, and miscommunication between the hospital staff and the concerned healthcare providers, have been identified in the literature review. These problems can be addressed by certain strategies and process streamlining, which may help the hospitals avoid unwanted delays in discharging patients. In our study, we used a multidisciplinary approach whereby different strategies were analyzed and put into practice by eliciting participation from the patients themselves, families/friends/pastoral visitors, healthcare staff including nurses and doctors, and administrative staff including floor managers and ward secretaries.

This collaboration across disciplines helped to understand the gaps of the process. We realized that good communication and coordination among all stakeholders involved in a patient's care journey are most important to ensure smooth transition from the hospital to home or post-acute care settings in the study. Regular team meetings, shared decision making, and clear assignment of roles and responsibilities assist in breaking down silos and di-vinyl a culture of collaboration.

A study by Bai AD suggested that a simple clinical prediction model was used, and this helped identify patients at risk of delayed discharges so that healthcare providers could focus on these patients with interventions aimed at facilitating an earlier discharge. It also proposed some evidence-based strategies, including the development of clinical pathways based on specific patient populations, provision of quick and appropriate rehabilitation services at the weekends, and analysis and planning of the process of discharge of these patients through multidisciplinary collaboration to smoothen the process (5). The latter considers it a continuous evaluation of the discharge process metrics, such as TAT, readmission rates, and patient satisfaction scores, which can provide the lead for hospitals to find lacunae, track the impact of interventions, and drive ongoing optimization efforts.

For this study, a root-cause analysis was conducted as the first step of research. The root cause analysis suggested that the main causes of delay in discharge were inadequate discharge planning and pending discharge summary finalization and its hand over. Key issues included inefficient discharge care planning, delayed discharge summaries, irregular doctor

rounds, patient education gaps, financial barriers, IT system issues, and billing errors. These factors were identified to inform targeted interventions and improve the discharge process.

A cost analysis was also carried out, and it has been noticed that the prominent costs incurred were direct costs, like the cost of staffing, utility, transportation, etc. The involved indirect costs were time, reputation, loyalty, satisfaction, etc. The main drivers for the high costs of delayed hospital discharge are:

- Patients occupying beds beyond their medical necessity, therefore restricting the organizations ability to admit new patients - diminishing the overall operational efficiency. Impacts if not managed: lost revenue from missed admission opportunities; reduced patient satisfaction. It is impossible for hospitals to be used at full capacity with people occupying beds that do not need acute care.
- Rise in nursing and administrative costs for monitoring and coordinating the care of the discharge-delayed patient. More hours are used by nurses and managers to arrange post-discharge services, contact families, and deal with insurance and social service systems. The nursing resources are diverted from direct care.
- Higher rates of complications: The patients can develop nosocomial infections. The longer a patient has been in the hospital, the greater his risks of developing infections like pneumonia, UTIs, and bloodstream infections. Other secondary factors that have contributed to the costs of delayed discharges include:
 - Increased use of diagnostic tests and procedures to monitor clinically stable patients awaiting discharge.
 - Prolonged durations of intravenous antibiotic therapy for patients who develop infections
 - Potential for medication errors and adverse drug events when patients remain on multiple medications for extended periods.
 - Emotional distress and dissatisfaction for patients and families due to delayed discharges.

The literature identifies the following essential interventional strategies to enhance and smoothen the process of hospital discharge:

- One of them is targeting a reduction in bureaucracy, with the scrapping of lengthy Health Needs Assessments and the introduction of standardized forms to simplify the process of capturing essential patient information.
- Improvement in communication and coordination of care, including the initiation of daily multidisciplinary team meetings as one way to review patient progress and discuss ways to minimize potential delays and ensure two-way exchange of information between hospitals and other providers.

This also includes improvements in patient engagement and transition, such as allowing patients and caregivers to communicate and follow up through secure messaging, remote

monitoring platforms; preparing them through comprehensive patient education for supporting self-management; designing medication reconciliation and post-discharge follow-up programs.

It places last emphasis on literature harnessing data and technology. Such examples would include employment of automated discharge planning tools for quick access to complete information about a patient, preparation and sharing of an electronic summary regarding discharge in early fashion, and analysis of comprehensive data regarding discharge processes for quality continuous improvement. The research put much emphasis on the fact that only multifaceted, systems-based approaches that bundle all these interventions together streamlining a complex hospital discharge process are most effective in improving patient outcomes. In this line and extent, some other strategies identified in previous literature were implemented. Strategies used to make the discharge process smooth and easy during the study period included the multidisciplinary discharge leader who had sole responsibility to communicate, counsel, and streamline the discharge process for every patient; this would enable patient-centric focus of the leader towards discharge only. The other strategy used is the introduction of Red to Green Bed Days with the application of patient flow bundle. This became an effective measure that helped clearly tell the results for each patient and helped in the identification and rectification of many hidden gaps in this process of discharge.

Chapter 6: Conclusions and Recommendations

This quality improvement study has shed light on multifactorial causes of delayed discharges within a hospital setup and proposed strategies with an evidence base to optimize the discharge process. This study has shown from an in-depth review of the root causes for delayed discharges that inadequate post-discharge care arrangements, deficits in social support, and logistic problems are all indicative of the need for targeted interventions to address these outliers. The results of this study also further emphasize that inefficiencies within the system have a great bearing on patient outcome and health care resource use. Delayed discharge from hospitals means extended-stay patients, which increase healthcare costs, create a shortage of beds, and sometimes jeopardize the well-being of their patients. Only by identifying the roots and understanding the ramification can healthcare organizations formulate and execute strategies to improve the process of discharge for better care and outcomes of the patients and enhanced efficiency of the whole healthcare system. The mixed-methods approach of the study, with its integration of quantitative analysis of hospital administrative data and qualitative input from key stakeholders, has made possible a rich and detailed understanding of the complex problems leading to delayed hospital discharges. Key information from this approach has been provided to guide the development of targeted strategies in the optimization of the discharge process and enhance patient outcomes maximally. The recommendations and strategies that were proposed in the study should serve as the roadmap by which health care organizations drive towards the optimal discharge process with minimized delays and increased overall efficiency in hospital operations. Addressing the root causes of delayed discharge by proposing evidence-based interventions, healthcare providers will improve patient outcomes.

Identify and analyze the root causes of delayed hospital

Causes:

- Pending Discharge Summary Finalization: The discharge summary is an important document in finalizing a patient's discharge process. The average delay in discharge summary was more than expected. This was due to a delay in signing off by the primary doctor. The root causes were further categorized and assessed where doctor-related causes were major causal factors for delayed discharge processes, while MT-related delay was quite less.
- Unplanned Discharge Care Plan: A discharge care plan is tailored with the involvement of a patient to ensure smooth transition and aftercare upon this premature discharge from the health institution. It ensures continuity of care that follows the patient upon discharge, since it consists of such vital elements as follow-up medical appointments and instructions on how best the medication of the patient

is to be managed upon discharge from the hospital. The care plan also includes the provision of any required medical equipment or home health services that will aid in caring for the patient within the community setting. However, due to it being unplanned, the care plan was not taken care of in detail. Only planned discharge care plans help in streamlining the information for patients. Most of the discharges were announced unexpectedly and immediately at any time of the day, when the primary doctor thought it was right to. Very few planned discharges were announced during the course of the study. This was seen as one of the major cause of delay in discharge process.

- Others: Other secondary causes found were administration related, patient related and process related.

The administrative bottlenecks identified during the study were equipment problems such as slow Hospital Information System, breakdown of equipment or machinery. Patient-related causes included transportation issues, lack of patient awareness and knowledge on discharge, language/cultural/financial barriers. The process-related factors include delays in TPA approvals due to long, tedious scrutiny and documentation, bottlenecks related to billing, incomplete billings activity, cancellation of an activity in billing, etc.

Recommendation: It will follow a detailed discharge planning assessment, which will be accomplished by appointing a multidisciplinary discharge leader and implementing the Red to Green Bed Days in combination with the SAFER patient flow bundle. Other activities or elements of SAFER include the following: senior clinician review; counseling of the patient and his/her family regarding the criteria and expected date of discharge; execution of Inter-Disciplinary Team Rounds for appropriate decision making; and optimization of patient flow. These best practices can help hospitals enhance their efficiency and effectiveness in discharge planning, producing better patient outcomes and reducing readmissions while making sure greater satisfaction for patients and staff. Much of these strategies helped pry the discharge process open to more streamlined operations and improved overall patient outcome.

Various kinds of costs associated, and to provide practical solutions that address the identified causes of delayed discharges.

- Direct Costs: Delayed discharge has large associated costs, directly connected with staffing, utilities, and transportation. Most of these direct costs put a heavy burden on the healthcare system. The costs also include opportunity costs, administrative costs, and manpower costs. It was seen that because of these costs, most of the expenditure was wasted. Moreover, the wastage of resources which could have been otherwise gainfully employed elsewhere was also seen.
- Indirect Costs: Indirect costs involved were time, reputation, loyalty, and satisfaction. The most important of them all was the loss of reputation due to decreased patient satisfaction. Patients and their families were seen to be highly distressed and disappointed by the overall discharge process. Some even quoted on never returning back to the hospital for further treatment.

Recommendation: Herewith is the **Discharge Leadership Model** we have proposed, taking into consideration the needs of the hospital, wherein a discharge coordinator will be appointed. Most of the hospitals were successful in designating a discharge coordinator or case manager who can take charge of the discharge process. This person acts as a central point of contact, thus bringing clarity to the communication between the patient and family with all the involved providers. The discharge process ought to have strong leadership for it to maximize its potential in offering support to patients at an early discharge from the hospital than anticipated. The nursing managers and other health care leaders play very crucial roles in leading the success of discharge planning through some distinguished strategies. These include clear communication and guidance, collaborative and inspirational leadership, rounding, and taking follow-up from staff also, patients. The discharge leader should also help provide post-discharge arrangements, which can get rather complicated for patients, such as arranging transportation or providing home care. This charge leader should ensure there is planning for the discharge of patients. This discharge planning needs to begin as soon as the patient enters the hospital and not just after a discharge announcement has been made. Effective discharge planning prevents last-minute delays and provides smooth delivery of care.

Hence, this study offers a holistic approach to understanding and analyzing the discharge process. It further explains how these evidence based strategies can be employed to facilitate and streamline the discharge process, making it more patient-centric and patient friendly.

REFERENCES

1. Laurel Cadel SJTGKMK. Initiatives for improving delayed discharge from a hospital setting: a scoping review. *BMJ*. 2023 March.
2. Alexander Micallef SCBGTLG. Defining Delayed Discharges of Inpatients and Their Impact in Acute Hospital Care: A Scoping Review. *International Journal of Health Policy and Management*. 2022 February.
3. S Arthi SD. A study on causes of delay in discharge process in one of the prominent hospitals in Tamil Nadu. *International journal of Creatiev Research Thoughts*. 2020 April; 8(4).
4. Jenyz Mundodan KSS. A Study to Assess the Factors Contributing to Delay in Discharge Process in Teaching Hospital. *International Journal of Research Foundation of Hospital and Healthcare Administration*. 2020 July.
5. Anthony D Bai CDSS. Risk factors, costs and complications of delayed hospital discharge from internal medicine wards at a Canadian academic medical centre: retrospective cohort study. *BMC Health Services Research*. 2019 December.
6. Shahnawaz Hamid FAJHRHITA. Study of discharge process of patients admitted in inpatient department of a tertiary care hospital of north India with a special focus on reducing the waiting time. *International Journal of Medical and Health Research*. 2018 July; 4(7).
7. Boyd S. Hospital Administrators' Strategies for Reducing Delayed Hospital Discharges and Improving Profitability. *Walden Dissertations and Doctoral Studies Collection*. 2017.
8. James Gagan HGLS. Delayed Discharges and Hospital Type: Evidence from the English NHS. *Fiscal Studies: The Journal of Applied Public Economics*. 2017 September; 38(3).
9. Kochar R. Role of discharge summary in delayed discharge process. *Galore International Journal of Health Sciences and Research*. 2016 December; 1(1).

10. P Hendy JHPTC. In-depth analysis of delays to patient discharge: a metropolitan teaching hospital experience. Elsevier Clinical Medicine. 2012 August.