

**OPD PATIENT TAT ASSESSMENT AT CARE HOSPITALS, RAMNAGAR,
VISAKHAPATNAM FROM MARCH 2025 TO APRIL 2025: A CROSS-
SECTIONAL STUDY TO IDENTIFY FACTORS CONTRIBUTING TO
PROLONGED TAT**

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

Srabani Chattopadhyay

Under the Supervision and Guidance of

Dr. Ritu Vashistha

2025

COMPLETION CERTIFICATE

This is to certify that Dr SRABANI CHATTOPADHYAY in partial fulfillment of the requirements for the award of the degree of MBA in Hospital and Health Management from the IIHMR University, Jaipur, has successfully completed her internship at **CARE Hospitals** during March 10th 2025 to May 31st 2025.

Place: Visakhapatnam

Date: 31-05-2025

For **Quality Care India Ltd,**


V. Anil Kumar
Senior Manager-HR



CERTIFICATE

This is to certify that dissertation titled **OPD PATIENT TAT ASSESSMENT AT CARE HOSPITALS, RAMNAGAR, VISAKHAPATNAM FROM MARCH 2025 TO APRIL 2025: A CROSS-SECTIONAL STUDY TO IDENTIFY FACTORS CONTRIBUTING TO PROLONGED TAT** is a record of the research work undertaken by **Dr. Srabani Chattopadhyay** 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 her approach to the research study has been sincere, scientific, and analytical.



Faculty Guide

Dr. Titu Vashista

IIHMR University, Jaipur

Date



School Dean

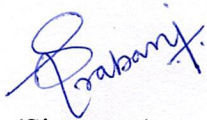
Dr. Sanjay Gupta

IIHMR University, Jaipur

Date

CERTIFICATE

I hereby declare that this dissertation titled **“OPD PATIENT TAT ASSESSMENT AT CARE HOSPITALS, RAMNAGAR, VISAKHAPATNAM FROM MARCH 2025 TO APRIL 2025: A CROSS-SECTIONAL STUDY TO IDENTIFY FACTORS CONTRIBUTING TO PROLONGED TAT”** 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 Information derived from the published or unpublished work of others has been duly acknowledged in the text.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: Dr. Srabani Chattopadhyay

Date:

ACKNOWLEDGMENT

My sincere gratitude to Dr. Ritu Vashistha, Assistant Professor at IIHMR University, Jaipur, for her significant advice, help and mentorship throughout the course of my dissertation project. The insights and perspectives of Dr. Vashistha have greatly influenced the course of my research and improved the calibre of my work. She has been a constant source of inspiration for me because of her unwavering commitment, forbearance and encouragement. I sincerely appreciate her for the time and effort she put in me.

I would also like to express my heartfelt gratitude to our respected Dean of Institute of Health Management Research, Dr. Sanjay Gupta, for his continuous guidance and support throughout out MBA course. He has provided us students with a plethora of knowledge and insight into management in the field of healthcare. His mentorship has been extremely helpful in the successful completion of my research.

We are deeply grateful to our dedicated mentors- Mrs. Joga Satyaveni Chimmili, AGM-Operations-Ramnagar, Mr. Anil Kumar VT, AGM-Operations- Arilova and Mr. Mayukh Chaudhuri, HCOO CARE Hospitals, Visakhapatna- for their invaluable assistance with my dissertation. Their insightful guidance, constructive feedback, and unwavering encouragement have been instrumental in shaping my research and academic growth. I sincerely appreciate their time, expertise and commitment to my success.

Finally, a heartfelt thank you to my parents, Mr. Prabir Kumar Chattopadhyay and Mrs. Paromita Chattopadhyay, and sister, Dr. Sreyasi Chattopadhyay, for their unwavering love, support and encouragement throughout this entire dissertation journey. Their belief in me and constant motivation provided the strength I needed to persevere. I am truly grateful for their understanding and sacrifice.

TABLE OF CONTENTS

S.no	Content	Page Number
1.	List of Abbreviations	8
2.	List of Tables	9
3.	List of Figures	10
4.	Abstract	12
5.	Chapter 1: About- CARE Hospitals	14
6.	Chapter 2: Introduction	18
6.1	Overview of OPD in CARE Hospitals, RamNagar Visakhapatnam	19
6.2	Objectives	27
7.	Chapter 3: Review of Literature	28
8.	Chapter 4: Methodology	36
9.	Chapter 5: Results	40
10.	Chapter 6: Discussion	48
11.	Chapter 7: Recommendations	55
12.	Chapter 8: Conclusion	58
13.	References	61
14.	Annexure	64
15.	Plagiarism Report	65

LIST OF ABBREVIATIONS

S.No	Abbreviation	Full Form
1.	2D-ECHO	Two-Dimensional Echocardiography
2.	BARC	Bhabha Atomic Research Centre
3.	BMW	Biomedical Waste Management
4.	CATH	Cardiac Catheterization
5.	CEO	Chief Executive Officer
6.	CGHS	Central Government Health Scheme
7.	CHC	Community Health Centre
8.	CSSD	Central Sterile Supply Department
9.	CT	Computed Tomography
10.	DH	District Hospital
11.	DSA	Digital Subtraction Angiography
12.	ECG	Electrocardiogram
13.	ECHS	Ex-Servicemen Contributory Health Scheme
14.	ED	Emergency Department
15.	EEG	Electroencephalogram
16.	EMG	Electromyography
17.	EMR	Electronic Medical Record
18.	ENT	Ear, Nose & Throat
19.	EP	Electrophysiology
20.	ESI	Employees State Insurance Scheme
21.	HK	Housekeeping
22.	HR	Human Resource
23.	ICU	Intensive Care Unit
24.	IOM	Institute of Medicine
25.	IPD	Inpatient Department
26.	IQR	Interquartile Range
27.	MRD	Medical Records Department
28.	MRI	Magnetic Resonance Imaging
29.	NCS	Nerve Conduction Study
30.	NDV	Naval Dockyard
31.	PHC	Primary Health Centre
32.	RELHS	Retired Employees Liberalized Health Scheme
33.	SC	SubCentre
34.	SD	Standard Deviation
35.	SDH	Sub District Hospital
36.	SPSS	Statistical Package for Social Sciences
37.	TAT	Turn Around Time
38.	THR	Total Hip Replacement
39.	TKR	Total Knee Replacement
40.	UHID	Unique Health Identification

LIST OF TABLES

Table Number	Content	Page Number
1.1	Services & Departments of CARE Hospitals	14
2.1	Ideal process, wait and overall TAT for OPD Cash, CGHS and Credit patients	23
4.1	Description of TAT variables	37
5.1	Distribution of OPD patients according to departments and payer type at CARE Hospitals, Ramnagar, Visakhapatnam (n=261)	40
5.2	Distribution of OPD Patients According to Achievement of Ideal Turnaround Times (TAT) Across Different Functional Areas (n=261)	41
5.3	Distribution of OPD patients according to their compliance to Ideal process TAT,Waiting time and Overall TAT	43
5.4	Median, IQR, Minimum, and Maximum time of individual time variables related to OPD TAT (n=261)	45
5.5	Association between each department, payer type, and individual TAT variables with the achievement of Ideal TAT (n=261)	45

LIST OF FIGURES

Figure Number	Content	Page Number
Fig 1.1	Vision, Mission & Values of CARE Hospitals	14
Fig 1.2	Roadmap of CARE Hospitals, India, 1997-2023	16
Fig 1.3	Location of CARE Hospitals Facilities in India	17
Fig 2.1	Stakeholders in OPD	23
Fig 2.2	Process flow for OPD Cash patients	24
Fig 2.3	Process flow for OPD CGHS patients	25
Fig 2.4	Process flow for OPD Credit patients	26
Fig 4.1	Variables included under process TAT and waiting time	37
Fig 4.2	Sequence of the TAT variables	38
Fig 4.3	Hypothesis Testing of Individual Turnaround Times (TATs) on Overall Outpatient Department Turnaround Time (O-TAT)	39
Fig 5.1	Distribution of OPD patients across clinical departments (n=261)	40
Fig 5.2	Distribution of OPD patients according to TAT1 compliance (n=261)	41
Fig 5.3	Distribution of OPD patients according to TAT2 compliance (n=261)	42
Fig 5.4	Distribution of OPD patients according to TAT3 compliance (n=261)	42
Fig 5.5	Distribution of OPD patients according to TAT4 compliance (n=261)	42
Fig 5.6	Distribution of OPD patients according to TAT5 compliance (n=261)	43
Fig 5.7	Distribution of OPD patients according to TAT6 compliance (n=261)	43

Fig 5.8	Distribution of OPD patients according to Process TAT compliance (n=261)	44
Fig 5.9	Distribution of OPD patients according to their compliance with the Ideal Waiting time (n=261)	44
Fig 5.10	Distribution of OPD patients according to their compliance with OTAT (n=261)	45
Fig 5.11	Common complaints encountered that contributed to delay (n=225)	47
Fig 6.1	Reasons for Delay in OPD Reception	48
Fig 6.2	Reasons for Delay in OPD Nursing Station	50
Fig 6.3	Reasons for delay in OPD Consultation	52

ABSTRACT

Title: OPD PATIENT TAT ASSESSMENT AT CARE HOSPITALS, RAMNAGAR, VISAKHAPATNAM FROM MARCH 2025 TO APRIL 2025: A CROSS-SECTIONAL STUDY TO IDENTIFY FACTORS CONTRIBUTING TO PROLONGED TAT

Author's Name: Dr. Srabani Chattopadhyay

Advisors' name: Dr. Ritu Vashistha

Key words: OPD, Outpatient clinic, waiting time, India, OPD TAT

Background: CARE Hospitals, Ramnagar has been facing the problem of prolonged OPD TAT. Long waiting periods are a major cause of dissatisfaction among patients. Reduction of TAT in the OPD can play a major role in improving patient satisfaction levels and the image of the hospital in the market.

Objectives: The main objective of the study was to evaluate the average TAT of the OPD and identify the factors contributing to the prolonged TAT.

Methodology: To identify these factors, a descriptive cross-sectional study was conducted from the period of 10th March 2025 to 10th April 2025. Data collection was done through direct observation from shadowing of OPD patients in the above-mentioned period. Data related to the payer type of patient and department they required consultation in was also recorded in addition to the time spent on processes and waiting before concluding of consultation. Univariate analysis was conducted to evaluate distribution of patients across various OPD departments and bivariate analysis was conducted to evaluate the contribution of factors such as department, payer type, individual and combined process and waiting times to the overall OPD TAT. Chi-square test was used to check for significant association and a p-value of less than 0.05 was considered significant. The total sample size for the study was 261.

Results: Twenty-nine percent of the patients belonged to cardiology department and 48 percent of the patients paid through cash. Fifty-two percent of the patients had to wait for less than five minutes in the queue to reach the reception. For 63 percent of the patients the process of registration and billing exceeded two minutes. Eighty-four percent of the patients had to wait for more than 10 minutes before getting called to the nurses station for recording vitals. Seventy-four percent of the patients had their vitals recorded in less than three minutes after approaching the nursing station. Eighty percent of the patients had to wait more than 30 minutes before entering the doctor's chamber for consultation and 83 percent patients' consultation concluded in less than 10 minutes. Seventy-five percent of the patients met the ideal process TAT of less than or equal to 15 minutes, whereas almost 82 percent of the patients exceeded the ideal waiting time of 45 minutes. Eighty-six percent of the patients did not meet the overall ideal OPD TAT. The average time spent waiting in queue to reach the reception was five minutes, and it was three minutes to conclude the registration and billing. The average time spent waiting to get called to the nurse's station was found to be 18 minutes and it took 2 minutes on an average to obtain all vital recordings. On an average, a patient spent 67 minutes waiting to receive their required consultation and spent six minutes inside the doctor's chamber to obtain their consultation. The average process TAT was found to be 12 minutes, and

the average waiting time was found to be 90 minutes. The average overall OPD TAT was found to be 106 minutes. The Chi-square test found statistically significant association between the waiting time before getting called to the nurses' station, time spent waiting before receiving consultation, time spent inside the doctor's chamber to obtain consultation, process TAT and waiting time with meeting the ideal overall TAT of less than or equal to 60 minutes. Out of the 86 percent of patients that did not meet ideal TAT, 40 percent of the patients had a prolonged TAT due to late arrival of the consultant.

Conclusion: The research identified several critical gaps and inefficiencies contributing to prolonged patient waiting times and impacting patient experience. These issues were found to be a result of interlinked operational, infrastructural, and processual deficiencies. Key findings included discrepancies between appointment times and consultant availability, inefficiencies at registration and billing counters, lack of real-time interdepartmental coordination, inconsistent nursing staff presence at OPD desks, fragmented interdepartmental coordination with a lack of following of defined TAT protocols, inadequate physical infrastructure for elderly and mobility-impaired patients, and language barriers coupled with poor communication. The study proposed a comprehensive set of tailored recommendations, including barcode scanning, competency-based training, preventive maintenance of systems, strategic consultant scheduling, enhanced interdepartmental communication, and institutional mechanisms for performance monitoring, all aimed at improving OPD efficiency and patient satisfaction.

Chapter 1: About - CARE Hospitals

CARE Hospitals is a part of the Evercare Group, one of the leading chains in South Asia and Africa. CARE Hospitals is the regional leader in South and Central India and stands tall as one of the top five pan-Indian hospital chains. CARE Hospitals was founded by Bhupathiraju Somaraju, in Hyderabad and the current CEO is Jasdeep Singh. Sensing the huge gap between the need and availability of multi-specialty health services under one roof, CARE Hospitals stepped in to fill the void. The organization's belief in health inclusivity is the reason behind setting up facilities in non-metro cities for greater affordability and accessibility to quality healthcare. As of today, CARE Hospitals serves a population of over 25 million people. Overall, this organization is spread across 6 states, 7 cities and has 16 healthcare facilities.

Type of Hospital- Multispecialty Tertiary Hospital

Vision: To be a trusted, people centric integrated healthcare system as a model for global healthcare

Mission: To provide the best and cost-effective care, accessible to every patient through integrated clinical practice, education and research

Values: Transparency, Teamwork, Empathy & Compassion, Excellence, Education, Equity, Mutual Trust & Respect

Fig 1.1: Vision, Mission & Values of CARE Hospitals

Table 1.1: Services & Departments of CARE Hospitals	
Clinical Services & Departments	Non-Clinical Services & Departments
Clinical:	Support:
• Cardiology (including Interventional Cardiology, Electro Physiology study)	• CSSD
• Cardiothoracic & Vascular Surgery	• Laundry
• Critical Care (including Specialty ICU)	• Housekeeping(HK)
• Dermatology & Venereology	• BMW management
• Emergency Medicine	• Biomedical Equipment room
• Endocrinology	• MRD
• General Medicine	• Cafeteria

• General Surgery (including Laparoscopic & Bariatric surgeries, Robotic)	• Security
• ENT/ Otorhinolaryngology	Billing:
• Interventional Neuroradiology	• Insurance Assistance
• Liver Transplant	Administration:
• Surgical Oncology	• Operations
• Urology	• HR
• Heart & Lung Transplant	• Quality
• Medical Gastroenterology	• Finance
• Nephrology (including Dialysis)	• Marketing
• Neurology	
• Neurosurgery	
• Obstetrics & Gynaecology	
• Orthopedic surgery (including Joint Replacement Surgery, Arthroscopy, Arthroplasty & Robotic- TKR & THR)	
• Plastic & Reconstructive Surgery	
• Pulmonary medicine & Interventional Pulmonology	
• Renal Transplant	
• Surgical Gastroenterology (including Hepato Pancreatic Biliary Surgery & Robotic Surgery)	
• Anesthesiology	
Diagnostic:	
• 2D ECHO	
• Bronchoscopy	
• Color Doppler	
• Colonoscopy	
• DSA Lab/ CATH Lab	
• ECG	
• EEG/Video EEG	
• EMG/EP/NCS	
• Endoscopy	
• Holter Monitoring	
• MRI	
• Pulmonary Function Test	
• Spirometry	
• Sleep Study	
• Ultrasound	
• Treadmill Testing	
• X ray	
• CT scan (including CT-Angiography)	
Laboratory:	

• Clinical Biochemistry	
• Microbiology & Serology	
• Clinical Pathology	
• Hematology	
• Histopathology	
• Professions allied to medicine:	
• Dietetics & Nutrition	
Physiotherapy & Rehabilitation:	
• Clinical Pharmacology	
• Transfusion services	
• Blood Transfusion Services	
Pharmacy:	
• Pharmacy 24 x 7	

Some major Achievements of CARE Hospitals:

- CARE Hospitals was the first to develop India's indigenous Coronary Stent
- CARE Hospitals became the first hospital to perform Womb Transplant successfully
- First hospital in Andhra Pradesh to perform Swap Kidney Transplant
- CARE Hospitals was the first hospital to perform heart surgery on foetus
- CARE Hospitals has conducted 1000+ stapedotomy surgeries using skeeter drill and self-retaining ear canal retractor for conductive deafness. This became the 2nd largest study in the world which has been accepted by Cambridge University done by a single surgeon.
- First hospital in India to successfully perform Hybrid repair of Thoracoabdominal aortic aneurysm in the country
- CARE Hospitals became the first hospital in Andhra Pradesh to start image-guided skull-based surgery for Pituitary tumour

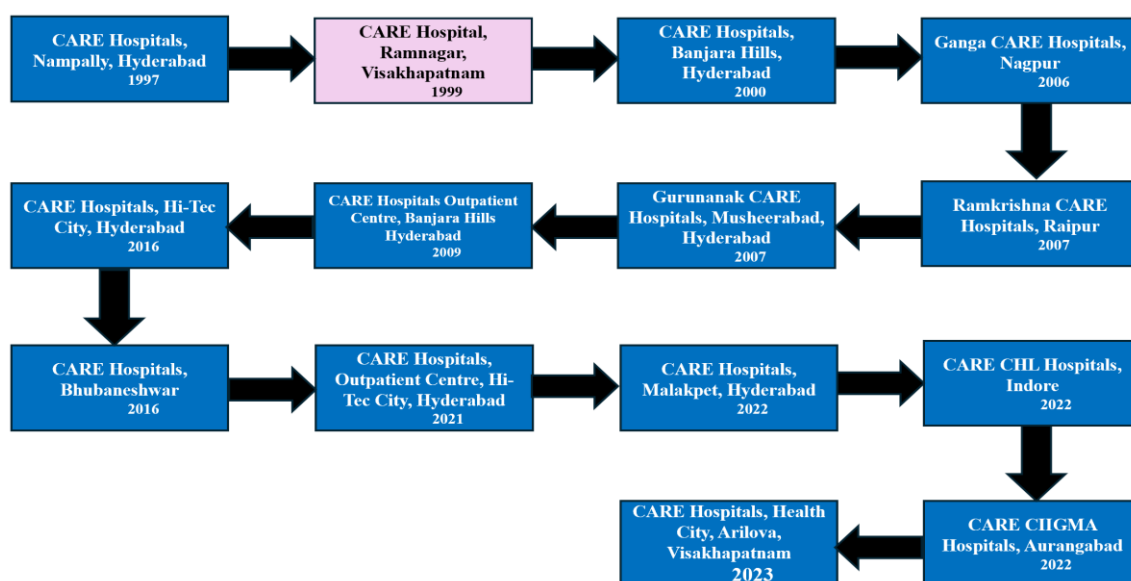


Fig 1.2: Roadmap of CARE Hospitals, India, 1997-2023



Fig 1.3: Location of CARE Hospitals facilities in India

Chapter 2- INTRODUCTION

Corporate hospitals in India have emerged as major healthcare providers, offering a wide range of services, particularly emergency and tertiary medical care. These hospitals are structured into several specialized departments, including the Inpatient Department (IPD), Outpatient Department (OPD), Emergency Department (ED), laboratory and sample collection units, pharmacies, radiology units, and many more. Among these, the OPD plays a pivotal role as it acts as the first point of clinical contact for a significant proportion of patients seeking healthcare services. It is within the OPD that preventive, diagnostic, and curative services are delivered on a large scale, ensuring timely intervention and management of diseases in their early stages^[1].

The OPD functions as a critical interface between the community and hospital-based services, providing consultations, primary treatments for minor ailments, and essential health education aimed at disease prevention and health promotion^[2]. Given the nature and volume of services offered, efficient OPD operations are vital for enhancing patient outcomes and overall healthcare delivery.

According to the Indian Public Health Standards (IPHS), healthcare delivery in India is organized in a three-tiered system: primary healthcare services are offered at facilities such as Sub-Centers (SC) and Primary Health Centers (PHC), secondary healthcare services are provided at Community Health Centers (CHC) and Sub-District Hospitals (SDH), while tertiary healthcare services are available at District Hospitals (DH), medical colleges, and private and corporate hospitals. While crowding is a well-recognized issue at government facilities—largely due to the free services provided—there is an emerging trend where corporate hospitals, especially those located in Tier 2 cities, are experiencing similar crowding challenges^[3]. This suggests that crowding is no longer limited to public sector institutions but is becoming an operational concern across the healthcare sector in India.

Waiting time for OPD patients is defined as the total duration from the moment the patient arrives at the OPD until the time they leave after receiving the required consultation^[4]. It is well-documented that prolonged waiting in queues is one of the major causes of patient complaints and dissatisfaction^[5]. Extended waiting periods are associated with various costs, including time costs, social costs, customer dissatisfaction costs, and employee-related operational costs^[6]. The implications of long waiting times extend beyond mere inconvenience. They can result in loss of valuable time for patients, prolonged suffering from illness due to delayed consultation, reduced time spent with physicians which can jeopardize the quality of diagnosis and treatment, and increased stress and anxiety among patients^[2].

The psychological burden associated with long waits does not only affect patients. Healthcare providers, including nurses and doctors, are also impacted, leading to stress and burnout that can significantly compromise the quality-of-service delivery and patient care^[7]. In the context of healthcare, OPD waiting time is recognized as a crucial determinant of service quality. Delays are costly—not only in terms of the direct

operational expenses incurred by healthcare institutions but also in terms of intangible costs such as a decline in patient satisfaction and trust in healthcare services^[8].

Internationally, quality standards such as those recommended by the Institute of Medicine (IOM) emphasize the importance of minimizing waiting times. The IOM has proposed that at least 90% of patients should receive their consultation within 30 minutes of their scheduled appointment time to ensure a high-quality healthcare experience^[9]. Despite these recommendations, data from developing countries reveal that patients often spend between 2 to 4 hours waiting for their consultations in OPD settings^[10]. Such excessive waiting times have a profound negative impact on patient satisfaction and can deter future healthcare-seeking behavior.

A study conducted in Vietnam highlighted another critical dimension to this problem: only 18% of patients were found to be receiving healthcare services from the appropriate level of the healthcare system^[11]. One of the main reasons why patients bypass lower levels of care to seek treatment at high-end tertiary facilities is the aggressive marketing strategies employed by these hospitals, the allure of being treated by renowned specialists, and the perception that advanced diagnostic and therapeutic technologies are only available at larger, more reputed institutions^[12]. While these factors drive patient traffic to tertiary centers, they also contribute to the overcrowding of such facilities, thus exacerbating waiting times and reducing service efficiency.

Further, a study conducted in a hospital in Northern India reported that patients frequently expressed dissatisfaction with the amount of time required to complete registration processes and the overall behavior of the overburdened hospital staff^[13]. Similar findings have been echoed across multiple studies, all of which underscore the strong negative association between extended waiting times and patient satisfaction^[14,15].

Given the complex interplay between operational inefficiencies, patient expectations, and healthcare system limitations, it is crucial to analyze the factors contributing to OPD delays in corporate hospitals. Understanding these factors is vital for developing strategic interventions aimed at improving patient experience, optimizing workflow, and enhancing the overall quality of healthcare services provided in these institutions.

2.1 Overview of OPD in CARE Hospitals, RamNagar Visakhapatnam:

The Outpatient Department (OPD) of CARE Hospitals, Ramnagar serves as a pivotal entry point into the hospital's healthcare delivery system and is a critical touchpoint for a large volume of patients seeking both preliminary and specialized consultations. With a thoughtfully designed layout spread across two floors, the OPD integrates multiple clinical specialties and diagnostic services to ensure streamlined patient management and comprehensive care. The OPD comprises 13 clinical departments, each strategically distributed across the two levels to optimize spatial utilization and clinical workflow efficiency.

On the ground floor, patients can access chambers dedicated to key specialties including Cardiology, Plastic Surgery, Endocrinology, Orthopaedics, Neurosurgery, and Gastroenterology. These departments cater to a high patient load, as they address chronic

diseases, surgical consultations, and specialized interventions. Supporting these clinical services, the ground floor is also equipped with chambers for essential diagnostic procedures such as Electrocardiograms (ECG), Echocardiography (ECHO), and Endoscopy, which are vital for evaluating cardiovascular, gastrointestinal, and related conditions. By co-locating diagnostics with relevant clinical specialties, CARE Hospitals enhances diagnostic turnaround and facilitates faster decision-making by clinicians.

The first floor expands this service infrastructure by accommodating additional specialties including Internal Medicine, Pulmonology, Otorhinolaryngology (ENT), Nephrology, Neurology, Gynecology, and Urology. This range of services ensures that patients with varied complaints and disease conditions—ranging from general ailments to gender-specific and chronic neurological or renal disorders—are provided access to comprehensive care under one roof. An X-ray room on this floor further adds to the diagnostic capabilities, allowing real-time imaging that supports clinical evaluation and diagnosis.

To assist in patient navigation, dedicated OPD reception counters are positioned on both floors, ensuring equitable distribution of administrative workload and minimizing bottlenecks related to appointment scheduling, billing, and patient queries. This dual-level reception system not only enhances patient flow but also plays a critical role in patient satisfaction, especially during peak hours.

The operational hours of the OPD at CARE Hospitals, Ramnagar, extend from 9:00 AM to 4:00 PM, functioning on all days of the week, thereby ensuring continuous access to healthcare for both new and follow-up patients. This seven-day operational model is particularly beneficial in urban healthcare settings, where patients often prefer weekend consultations due to weekday work commitments.

Patients visiting the OPD are categorized based on their mode of payment and financial coverage, which influences billing procedures and patient management pathways. These categories include:

- Cash or Self-Paying Patients
- CGHS (Central Government Health Scheme) Beneficiaries
- Credit Patients

Cash or self-paying patients are those who bear the full cost of medical consultations, diagnostics, and treatment out of their own pocket. According to the NHSRC, under the MoHFW, these individuals do not avail themselves of reimbursement or financial coverage under any form of government or private insurance. This category is still prominent in India despite the growth of health insurance, especially among middle-income patients seeking timely care without bureaucratic delays.

Credit patients, on the other hand, typically include individuals whose treatment costs are covered through corporate tie-ups or government-sponsored schemes. Among these, a notable scheme is the Aarogyasri Health Scheme, which was implemented by the state in 2007. This scheme provides financial protection for tertiary care services such as

surgeries, advanced diagnostics, and curative interventions to individuals belonging to the BPL population. It plays a significant role in reducing out-of-pocket expenditure for economically vulnerable groups ^[16]. In addition to Aarogyasri beneficiaries, credit patients also include employees and their dependents from organizations like BARC, NDV, and other government or private corporations that have established healthcare agreements with CARE Hospitals.

Moreover, patients may be beneficiaries of centrally operated government health schemes, which aim to ensure universal health coverage across different demographic and occupational segments. India currently administers four primary health schemes under the Central Government that offer a broad spectrum of healthcare services, including outpatient consultations, inpatient admissions, medication coverage, and specialized tertiary care ^[17]. These include:

- CGHS– covering active and retired civilian government employees and pensioners.
- RELHS and the Railway Health Service – focused on employees and retirees from the Indian Railways.
- ECHS – serving retired personnel of the Indian Armed Forces.
- ESIS – offering coverage to workers in the organized industrial and service sectors earning ₹1.8 lakhs or less annually.

Together, these schemes form a backbone of financial protection mechanisms in India's evolving healthcare landscape, facilitating access to both routine and specialized healthcare services, including those offered at tertiary care facilities like CARE Hospitals.

The OPD infrastructure at CARE Hospitals is functionally segmented into three key operational zones across both floors, each playing a distinct and critical role in ensuring smooth service delivery:

1. OPD Reception Area: The reception team handles both on-call (pre-scheduled) and walk-in appointments, registering patients, verifying identity and scheme-related documents, and initiating billing for consultations and investigations. Receptionists also coordinate with doctors' schedules and help manage patient queues. Efficient functioning of this area is critical, as delays here can cascade into longer wait times across the OPD.
2. Nursing Station: Nurses play an integral role in bridging patient care and clinical evaluation. Responsibilities include recording patient medical history, measuring vital signs such as temperature, blood pressure, pulse, and oxygen saturation, and preparing patients for their consultation. Post-consultation, nurses often counsel patients about medication regimens, dietary advice, or procedural preparations.
3. Doctor's Consultation Chambers: This area is the central hub of clinical care, where face-to-face interactions between doctors and patients occur. The doctor evaluates the chief complaint, conducts a clinical examination, orders necessary investigations, and prescribes a line of treatment. Depending on the complexity of

the case, the consultation may also involve detailed counselling, referral to other departments, or booking of further procedures or admissions.

Delays in any of these three functional domains can collectively or individually contribute to an increase in Outpatient Turnaround Time (OPD TAT)—a key performance indicator that reflects the overall efficiency and quality of patient care. An extended OPD TAT not only leads to patient dissatisfaction but may also result in clinical inefficiencies and staff burnout, particularly during high-volume days.

Several operational challenges can contribute to increased TAT, including:

- Overcrowding, especially during morning hours and weekends, leading to long queues at the reception and consultation areas.
- Staff shortages, particularly during lunch hours or due to absenteeism, affecting both administrative and clinical workflows.
- Technical issues or software glitches in the Hospital Information System (HIS), leading to delays in registration, billing, or investigation requisitioning.
- Delays in payment processing, especially for credit and scheme-based patients, due to the need for pre-authorization or lack of documentation.
- Patient-related delays, such as arriving without necessary medical records, identification documents, or scheme authorization papers.
- Infrastructural limitations, such as inadequate seating, long walking distances between diagnostic and consultation areas, or lack of wheelchairs or other mobility aids, especially for geriatric and differently-abled patients.

Therefore, a systematic assessment of these delays, their root causes, and the departments or processes most frequently impacted is essential for identifying operational bottlenecks. This analysis will help in formulating targeted improvement strategies.

By addressing these issues proactively, CARE Hospitals can significantly enhance the patient experience, reduce operational inefficiencies, and reinforce its commitment to quality outpatient care delivery. Improving OPD efficiency not only strengthens the hospital's reputation but also contributes to better clinical outcomes and resource utilization, especially in the context of a growing demand for outpatient services in tertiary care settings.

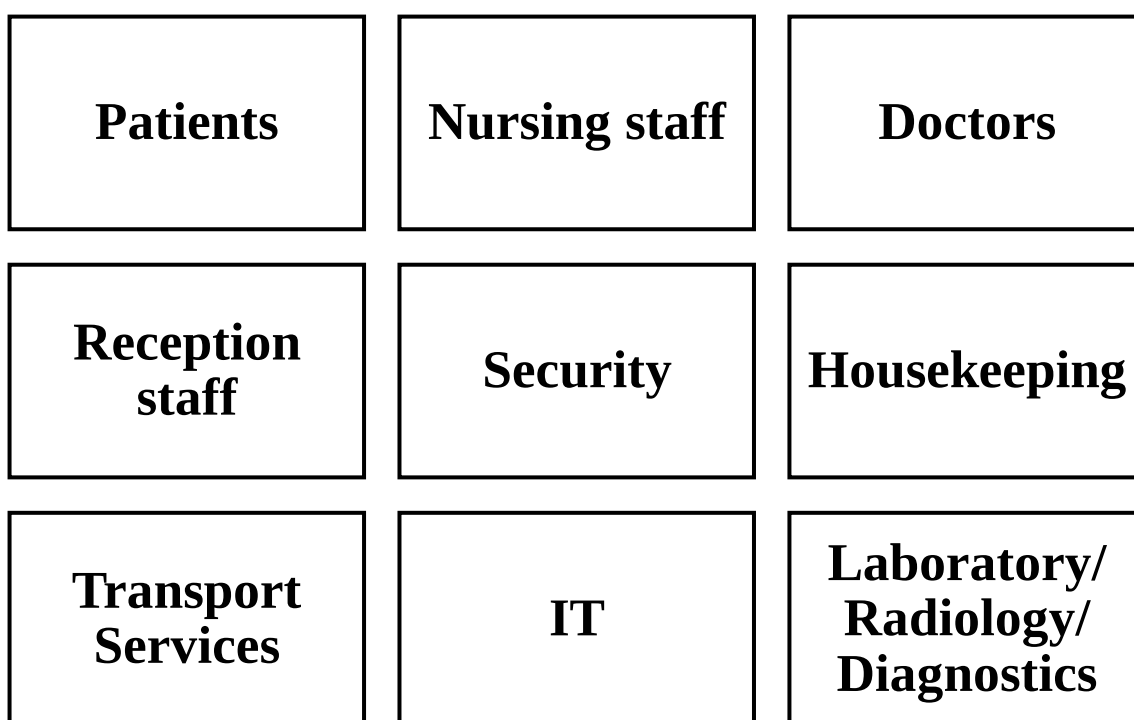


Fig 2.1: Stakeholders in OPD:

Table 2.1 Ideal process, wait, and overall TAT along with variable names for OPD Cash, CGHS, and Credit patients

Process and Waiting time	Variables	Ideal TAT
Registration and Billing TAT	TAT2	2 mins
Ideal waiting time in queue for registration	TAT1	5 mins
Ideal Nurse Station- Vital recording TAT	TAT4	3 mins
Ideal waiting time before getting called for recording vital	TAT3	10 mins
Ideal Consultation TAT	TAT6	10 mins
Ideal waiting time before consultation	TAT5	30 mins
Total TAT	OTAT	60 mins

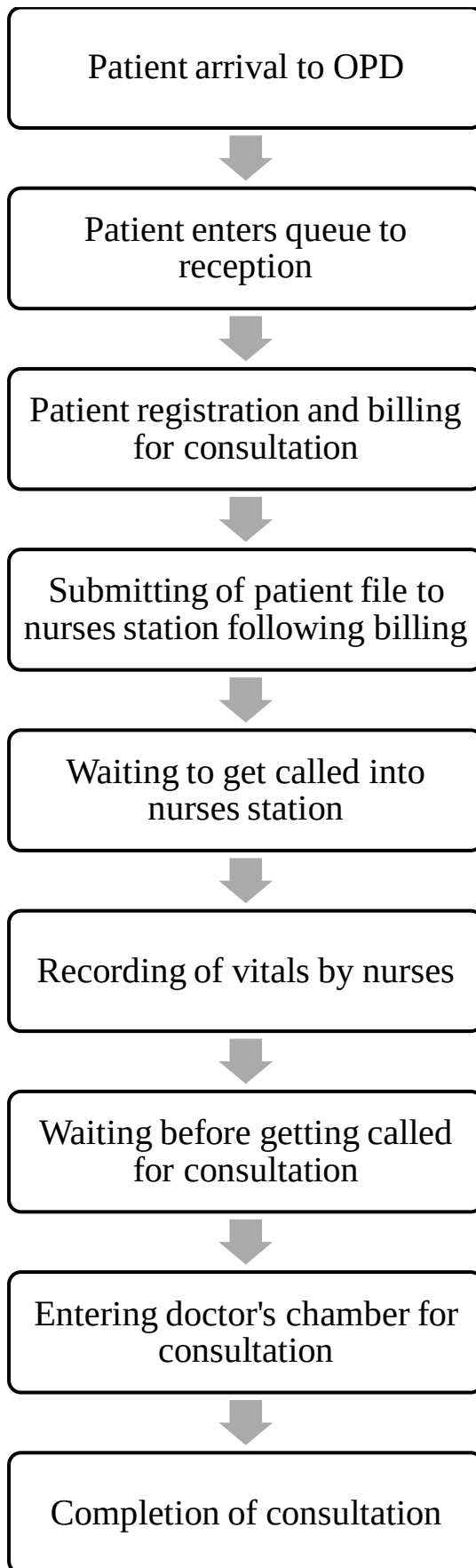


Fig 2.2 Process flow for OPD Cash Patients

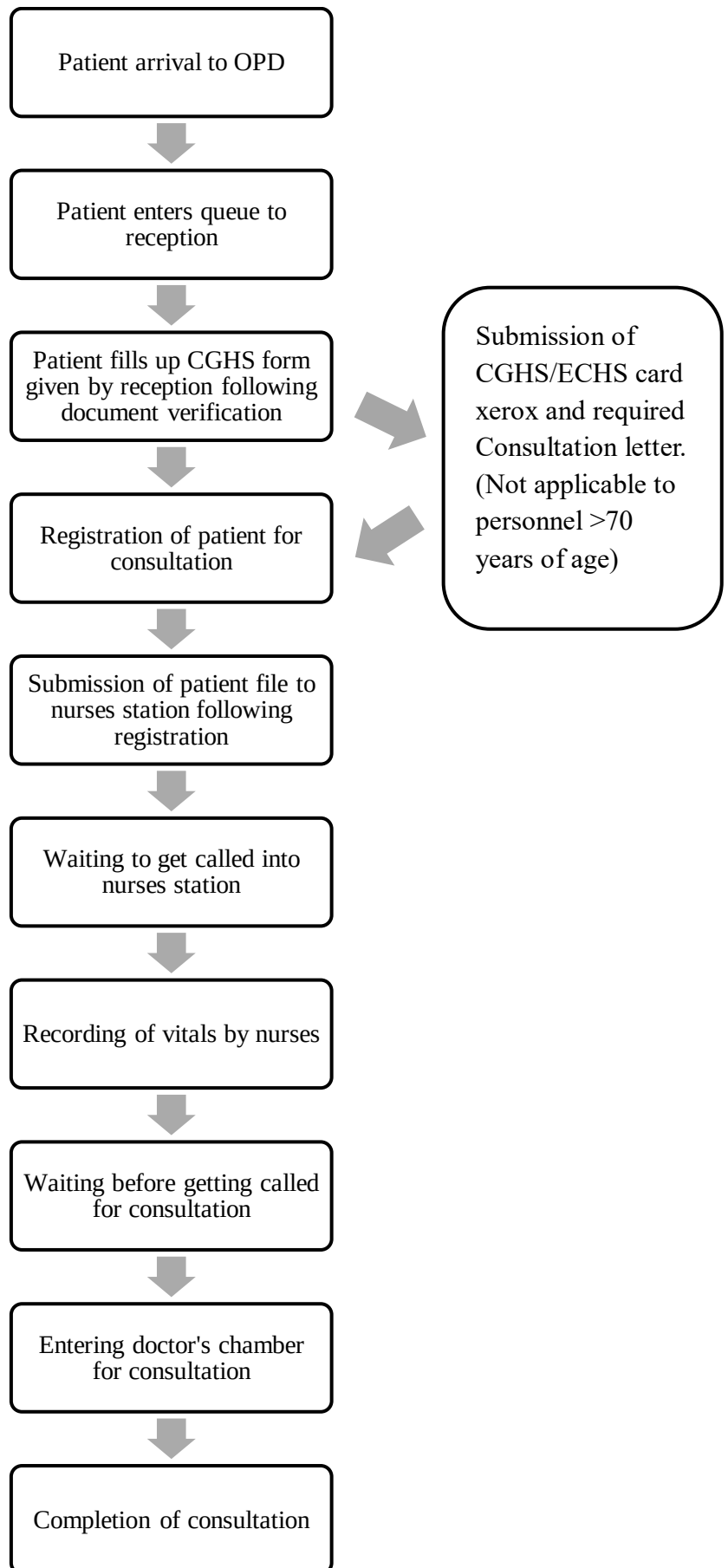


Fig 2.3 Process flow for OPD CGHS Patients:

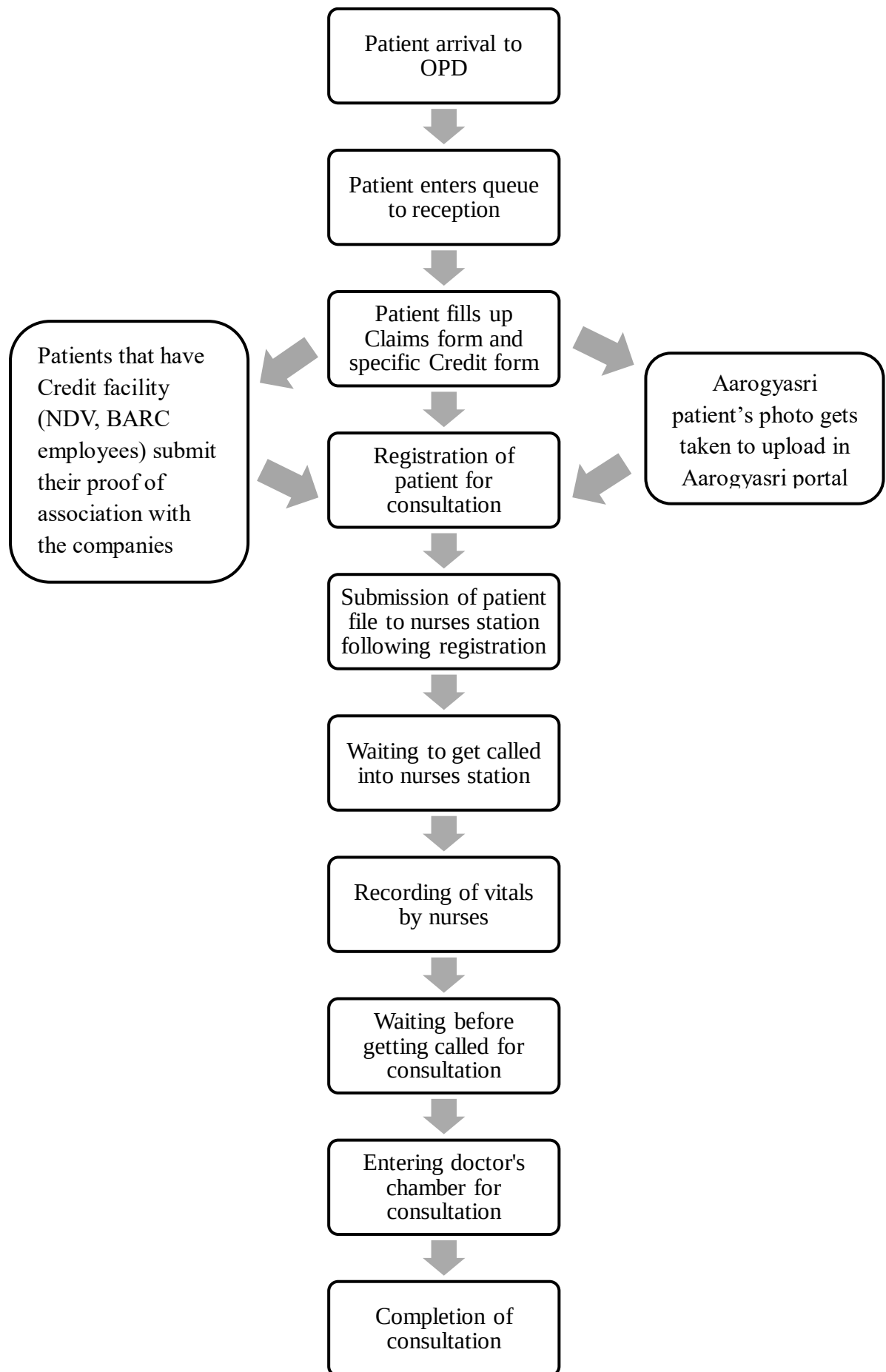


Fig 2.4: Process flow for OPD Credit patients

2.2 OBJECTIVES:

Broad:

To assess the average overall TAT of OPD and identify the factors influencing the TAT

Specific:

- To evaluate the mean wait period for patients in the queue to arrive at reception and identify sources of delays.
- To evaluate the average time required to complete the registration process and billing and identify factors leading to delay
- To evaluate average waiting time to approach the nurse station for vital check and determine the probable causes for delay.
- To evaluate the average time taken to record vitals and determine the probable causes for delay.
- To evaluate the average waiting time of patients before entering the doctor's consultation chamber and determine the probable causes for delay.
- To evaluate the average time taken by doctors to complete per-patient consultations and determine the probable causes for delay.

Chapter 3- REVIEW OF LITERATURE

S.no	Authors (year)	Study location	Sample Size	Sampling technique	Salient features
1.	Farah NAAZ ¹ , Idris MOHAM MED ² (2019) Medical Journal of Islamic World Academy of Sciences doi: 10.5505/ias.2019.89410 2019;27(3): 71-76	Ayurvedic and Unani Tibbia College and Hospital Block, Karol Bagh, New Delhi(India)	100	Convenience sampling Study Design- Descriptive cross-sectional	- Total OPD TAT for patients was 2hrs - Major delay was in waiting for consultation, which was 1 hr 10 mins. - Average time spent for consultation of each patient was 3 mins,
2.	Suong Thi Thao Nguyen ^{1,2} , Eiko Yamamoto ¹ , Mai Thi Ngoc Nguyen ² , Huy Bao Le ² , Tetsuyoshi Kariya ¹ , Yu Mon Saw ¹ , Cong Duc Nguyen ² , Nobuyuki Hamajima ¹	Thong Nhat Hospital, Vietnam	7,931	Simple Random Sampling Study Design- Descriptive Cross-sectional	- Mean overall TAT was 104.1 mins - Old age, consultations for internal medicine departments, patients that arrive for early registration, and patients that were undergoing blood sample collection were contributing to longer total wait time - For 4,564 patients who had a single department

	(2018) Thi Thao Nguyen S, Yamamoto E, Thi Ngoc Nguyen M, Bao Le H, Kariya T, Saw YM, Duc Nguyen C, Hamajima N. Waiting time in the outpatient clinic at a national hospital in Vietnam. Nagoya J Med Sci. 2018 May;80(2):227-239. doi: 10.18999/nagjms.80.2.227. PMID: 29915440; PMCID: PMC5995730.				consultation without any tests, there was a significant association between the department type and registration time with the total TAT. For 1259 patients who visited a single department with one test, there was a significant association between early registration and undergoing blood tests with total TAT
3.	Ravneet Kaur ¹, Shashi Kant ¹, Akhil Dhanesh Goel ², Nitika Sharma ³ (2022) Kaur R, Kant S, Goel AD, Sharma N. Patient	Sub-District Hospital (SDH), Faridabad, Haryana	200	Systematic random sampling (Every 10th person included in the sample) Study Design: Descriptive Cross-sectional	- Overall satisfaction of patients with OPD services was “good” or “very good” (responses were recorded on a 5-point Likert scale) - Patients were satisfied with the facilities provided for water consumption, toilet and time

	Satisfaction Among the OPD Attendees at a Secondary CARE Hospitals in Northern India. J Patient Exp. 2022 Aug 11;9:2374-3735221120497. doi: 10.1177/23743735221120497. PMID: 35983017; PMCID: PMC9380211.				spent by the doctor while consulting the patient Patients were not satisfied the time taken for registration and behaviour of staff in the hospital
4.	MO Oche ¹, H Adamu ¹ (2013) Oche M, Adamu H. Determinants of patient waiting time in the general outpatient department of a tertiary health institution in north Western Nigeria. Ann Med	Usmanu Danfodiyo University Teaching Hospital, Sokoto, North Western Nigeria	100 patients	Systematic sampling technique - Sampling interval obtained was 1.5 which was rounded off to 2 - Simple random sampling was used to enroll the first 2 patients to obtain	61% of patients waited for 90-180 mins in the clinic 36.1% of respondents spent <5 mins with the doctor - The most common reason for long OPD TAT was due to very less healthcare workers who had to deal with a large number of patients

	Health Sci Res. 2013 Oct;3(4):588-92. doi: 10.4103/2141-9248.122123. PMID: 24380014; PMCID: PMC3868129.			the starting point Following that every other new patient that came for consultation was included till require sample size was obtained Study Design- Descriptive cross-sectional	
5.	Ravikant Patel¹, Hinaben R. Patel² (2017) Patel R, Patel HR. A study on waiting time and out-patient satisfaction at Gujarat medical education research society	G.M.E.R. S. Hospital-Valsad	135	Simple Random Sampling- 15 patients were randomly chosen from each of the 9 departments of OPD Study Design- Cross-sectional, observational study	- In 48.89% of the cases, the hospital staff guided the patients to the correct consulting doctors 54.07% patients had a queue waiting time of 20 mins for registration - The average waiting time before consultation was 12.16 mins.

	hospital, Valsad, Gujarat, India. Int J Community Med Public Health. 2017 Mar;4(3):8 57-63.				
6.	Hiba Khan ¹ , Anshu Kumar Singh ² (2021) Khan H, Singh AK. A study on waiting time of the OPD Patient in a Multispecialty Hospital. International Journal For Research In Applied Science & Engineering Technology (IJRASET). Available At: WwW. Ijraset. Com. 2021.	Not disclosed	135	Sampling Technique- not mentioned Study Design- Descriptive cross-sectional	• 45.93% patients underwent registration after waiting in queue for 10 mins • 54.07% of patients underwent registration after waiting in queue for 20 mins. • 70.37% patients waited 10 mins before entering the doctors' chamber for consultation • 29.63% of patients waited >20 mins before entering the doctor's chamber for consultation • 76.30% of patients were examined by the doctor in less than 5 mins • 2.00% of patients were examined for 15-30 mins
7.	Nitika Sharma ¹ , Arun K. Aggar	North India	120; 50- online	Sampling Technique- not mentioned	• The average waiting time of walk in registered

	wal¹ Pankaj Arora², Pankaj Bahuguna^a (2022) Sharma N, Aggarwal AK, Arora P, Bahuguna P. Association of waiting time and satisfaction level of patients with online registration system in a tertiary level medical institute outpatient department (OPD). Health Policy and Technology. 2022 Dec 1;11(4):100687.		registered 70- walk in registered	Study Design- Descriptive Cross sectional	patients was four times higher compared to the online registered patients For every 1% increase in waiting time for registration at the online registration window, there was a 3% drop in satisfaction of patients
8.	Prasanthi KKN.¹, Perera KMH², Dharmadasa AGMM³, Ranathunga S⁴ (2023)	3 district hospitals of Gampaha district, Sri Lanka	Not mentioned	Sampling technique- not mentioned Study Design- Descriptive cross-sectional	- Average waiting time in all 3 hospitals ranged between 43 to 47 mins in the morning, and 18 to 31 mins in the afternoon - The average consultation time from morning to

	Ranathunga S. Case Study on Waiting Time and Consultation Time in OPD Patients at Three Selected District Hospitals of Gampaha District from January to March 2023.				evening ranged between 1.71 mins to 4.31 mins. The waiting time and consultation durations of the patients required improvements.
9.	Mensur Biya, Matebu Gezahagn, Bezawit Birhanu, Kiddus Yitbarek, Nigusu Getachew Waju Beyene (2022) Biya, M., Gezahagn, M., Birhanu, B. <i>et al.</i> Waiting time and its associated factors in patients presenting to outpatient departments at Public	Jimma Zone, Southwest Ethiopia	422	Systematic Random Sampling Study Design- Analytical Cross-sectional	- Waiting time ranged from 41 mins to 185 mins. - Patients that arrived from far away locations were 1.93 times more likely to wait for consultation compared to those that arrived from nearby places.

	Hospitals of Jimma Zone, Southwest Ethiopia. <i>BMC Health Serv Res</i> 22 , 107 (2022). https://doi. org/10.118 6/s12913- 022- 07502-8				
--	--	--	--	--	--

This was a descriptive cross-sectional study that was used to evaluate the time taken for a patient to conclude their consultation in the OPD from the time of their arrival into the department. The study was conducted in CARE Hospitals, Ramnagar in the district of Visakhapatnam. The hospital has 170 beds and 13 clinical outpatient departments.

Inclusion criteria: Patients that came to OPD from 10th March to 10th April 2025 from 9:00 AM to 2:30 PM (excluding Sundays in the mentioned period) were included in the study.

Exclusion criteria:

1. Patients that had to be billed for lab investigations only
2. Patients that got asked to go to a separate facility for consultation
3. Patients that had their appointments cancelled or rescheduled
4. Patients that left the facility after taking appointment
5. Patients that had to undergo lab investigations before consultation
6. Patients who did not complete the process from registration to consultation
7. Patients who had to undergo more than one consultation
8. Cases that resulted in delay from the patient's end

Data Collection: All data required to capture essential details pertaining to overall TAT was collected through direct observation of patient movements, by shadowing individual patients. The data was recorded in an Excel spreadsheet. The data collected included patient name, payer type, department they needed to consult, time of entry into the OPD, waiting time in queue before reaching registration, time at which they reached the reception/registration counter, time at which the registration and billing was concluded, waiting time before they were called to the nursing station, time at which they were called to the nursing station for vital check, time at which they exited nurse station following vital check, waiting time before consultation, time at which they entered doctor's chamber for consultation, the time at which they exited the doctor's chamber following consultation along reasons and areas of delay.

Sample Size: On average 100 patients visited the OPD of CARE Hospitals, Ramnagar from 10th March 2025 to 10th April 2025, that met the above exclusion criteria. Data was collected over a period of 26 days. Therefore, it can be said that the footfall within the time frame was 2600. 10% of the patients that met the criteria were included in the sample for this study.

Sample size= 10% of 2600 patients

= 260 patients

Data of 261 patients were collected.

Sampling Technique: The sampling technique used for this study was Convenience sampling. This sampling technique ensured that data collection could be adequately and accurately completed within the given time frame and that the sample serves as a representative of the population. This approach ensures the integrity and accuracy of the

data collected is maintained, which is of prime importance to the validity of the study. By selecting a 10% sample size, the study aims to establish a balance between statistical validity and practical feasibility, ensuring the study outcomes are reliable.

Data Analysis: The collected data is classified into process TATs and Waiting times. Process TAT is further divided into 3 categories- TAT2, TAT4, TAT6. Waiting time was also classified into 3 categories- TAT1, TAT3 and TAT5. The description of each variable is given in Table 4.1.

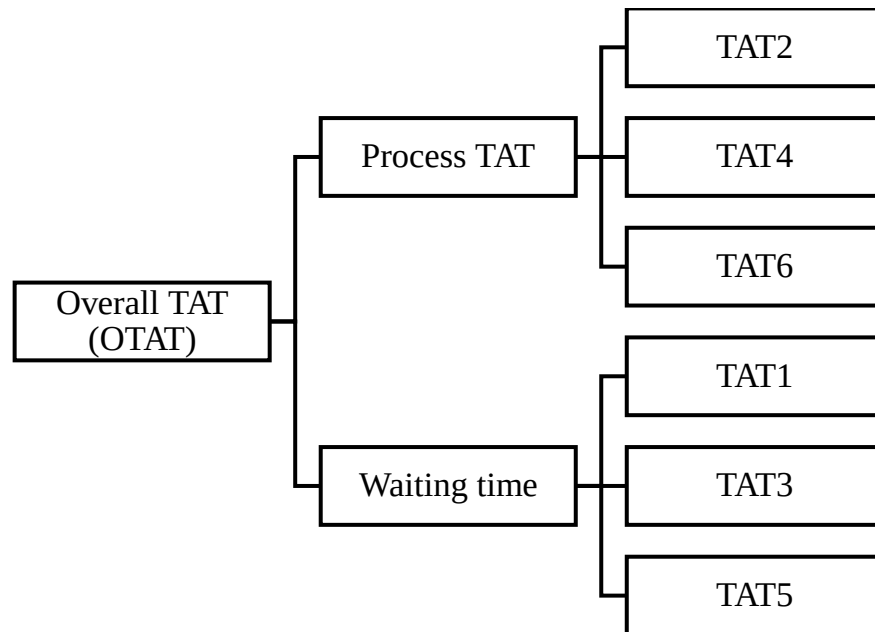


Fig 4.1 Variables included under process TAT and waiting time

Table 4.1 Description of TAT variables

	Variable Name	Description
Process TAT	TAT2	Time taken to complete registration and billing
	TAT4	Time taken to complete vital checking and recording at the nurse station
	TAT6	Time spent inside the doctor's chamber for consultation
Waiting Time	TAT1	Time spent waiting in queue to reach OPD registration desk
	TAT3	Time spent waiting before getting called to nursing station for recording of vitals
	TAT5	Time spent waiting before entering doctors chamber for consultation
Overall TAT	OTAT	Process TAT+Waiting time

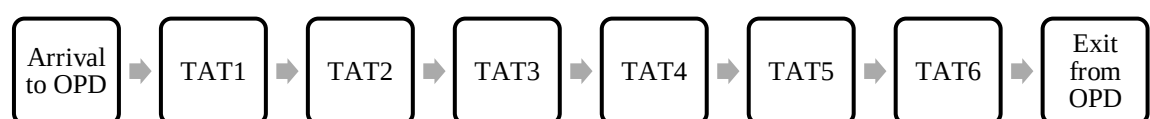


Fig 4.2 Sequence of the variables

$$\text{OTAT} = \text{TAT1} + \text{TAT2} + \text{TAT3} + \text{TAT4} + \text{TAT5} + \text{TAT6}$$

$$\text{Process TAT} = \text{TAT2} + \text{TAT4} + \text{TAT6}$$

$$\text{Waiting time} = \text{TAT1} + \text{TAT3} + \text{TAT5}$$

Statistical Analysis:

Data was collected and entered into an Excel spreadsheet along with the reasons for delay for each case. The data was analysed using SPSS version 26. Descriptive statistics was used to conduct univariate analysis to calculate frequency, and median. The variables were recoded to check the frequency of cases that met the ideal TAT for both processes and waiting time. A new variable was computed to check the frequency of number of cases that met the ideal overall TAT of 60 mins (Table 2.1). Bivariate analysis was done using the Chi-square test to check for statistical significance between the recoded variables and the computed variable. A P value of less than 0.05 was considered as significant.

Ethical Considerations:

Data collection was done with strict regard for patient confidentiality and privacy. Any identifying information that directly or indirectly refers to patient details were treated as strictly confidential, and measures were taken to prevent unauthorized access and disclosure.

Due to the observational nature of the study, verbal consent was obtained from each participant before shadowing them. They were informed about the purpose of the study, risks and benefits prior to their inclusion.

Non-intrusive observation methods were used to minimize and prevent harm and discomfort to patients included in research and other patients who were not a part of the study.

To reduce bias, no secondary data was collected from any other sources such as management or nursing registers. There was no preference for the age, gender, payer type or department of consultation for patients.

Limitations:

- The sample was drawn only from patients who visited the OPD from 9:00 AM to 2:30 PM from 10th March to 10th April. The sample does not include any patients beyond the mentioned hours or those who came to the OPD on Sundays. Data from such patients may reveal variations from the findings of the current study.
- Since patients requiring multiple consultations were excluded from the study, the overall TAT may not accurately reflect the actual time spent in the OPD by patients undergoing more than one consultation

Hypothesis:

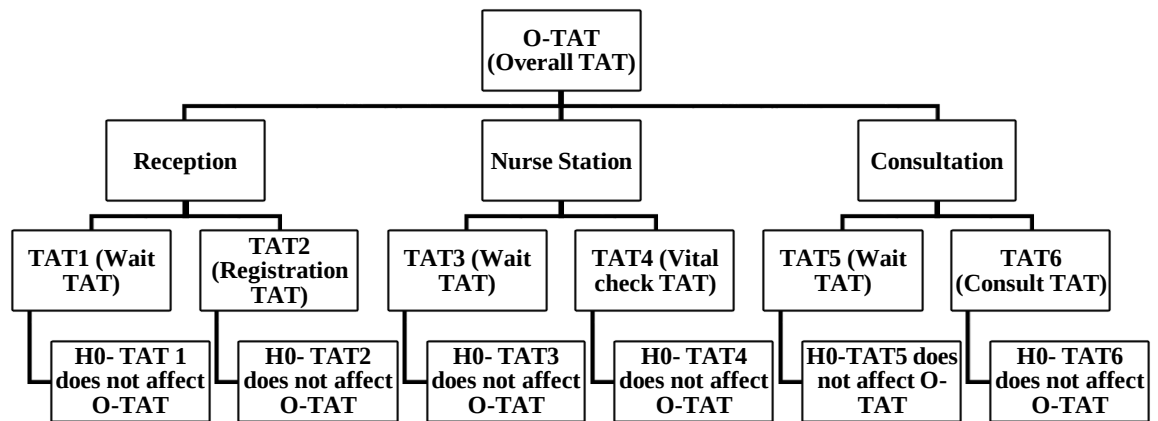


Fig 4.3 Hypothesis Testing of Individual Turnaround Times (TATs) on Overall Outpatient Department Turnaround Time (O-TAT)

Chapter 5- RESULTS:

Table 5.1 Distribution of OPD patients according to departments and payer type at CARE Hospitals, Ramnagar, Visakhapatnam (n=261)	
Departments	Percent
Cardiology	28.7

Internal Medicine	15.3
Neurology	14.9
Orthopaedic	9.2
Nephrology	7.7
Pulmonology	5.7
Urology	5.4
Gastroenterology	3.4
ENT	3.1
Endocrinology	2.7
Plastic Surgery	2.3
Dermatology	1.1
Gynaecology	0.4
Payer Type	
Cash	47.5
CGHS	28.0
Credit	24.5

An analysis was carried out to show the distribution of 261 OPD patients according to departments and payer type at CARE Hospitals, Ramnagar, Visakhapatnam (Table 5.1). It was observed from the analysis that almost three-tenths of the patients (29%) belonged to the cardiology department. Furthermore, the analysis also revealed that almost half of the patients were cash payers (48%).

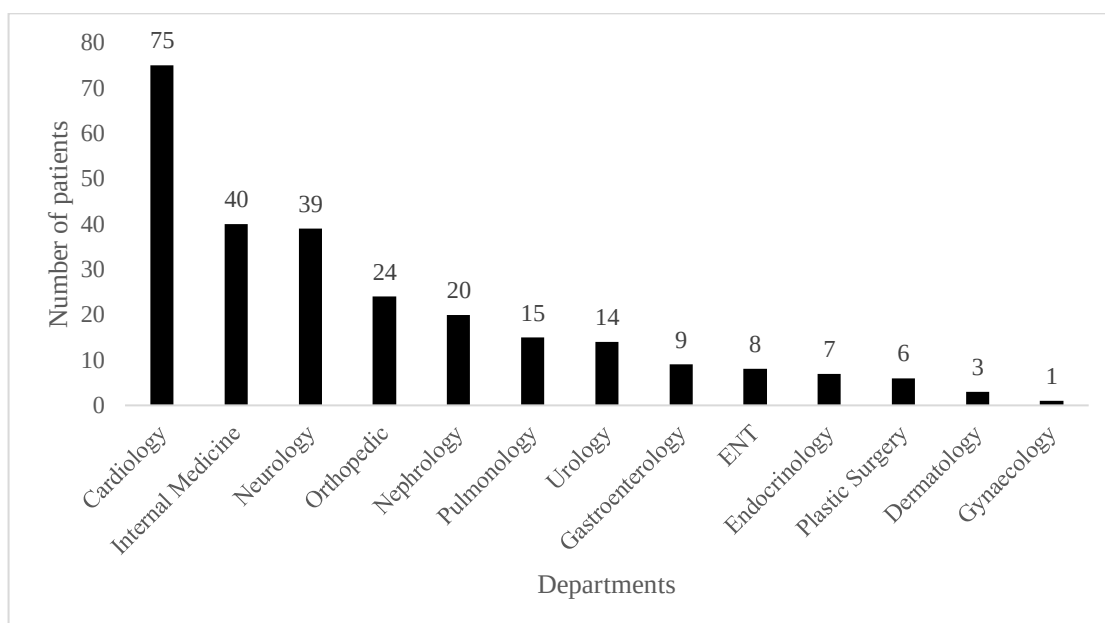


Fig 5.1 Distribution of OPD patients across clinical departments (n=261)

Table 5.2 Distribution of OPD Patients According to Achievement of Ideal Turnaround Times (TAT) Across Different Functional Areas (n=261)	
Functional Area	Percent
Reception	
TAT1	
<= 5 mins	51.7

>5 mins	48.3
TAT2	
<= 2 mins	37.2
>2 mins	62.8
Nurse Station	
TAT3	
<= 10 mins	16.1
>10 mins	83.9
TAT4	
<= 3 mins	73.6
>3 mins	26.4
Consultation	
TAT5	
<= 30 mins	19.9
>30 mins	80.1
TAT6	
<=10 mins	83.1
>10 mins	16.9

On further analysis (Table 5.2), more than half of the patients met the ideal TAT1 (52%). More than three-fifths of the patients did not meet the ideal TAT2 (63%). More than four-fifths of the patients did not meet the ideal TAT3 (84%). Seventy-four percent of the patients met the ideal TAT4. Four-fifths of the patients (80%) did not meet ideal TAT5. 83 percent of the patients met the ideal TAT6.

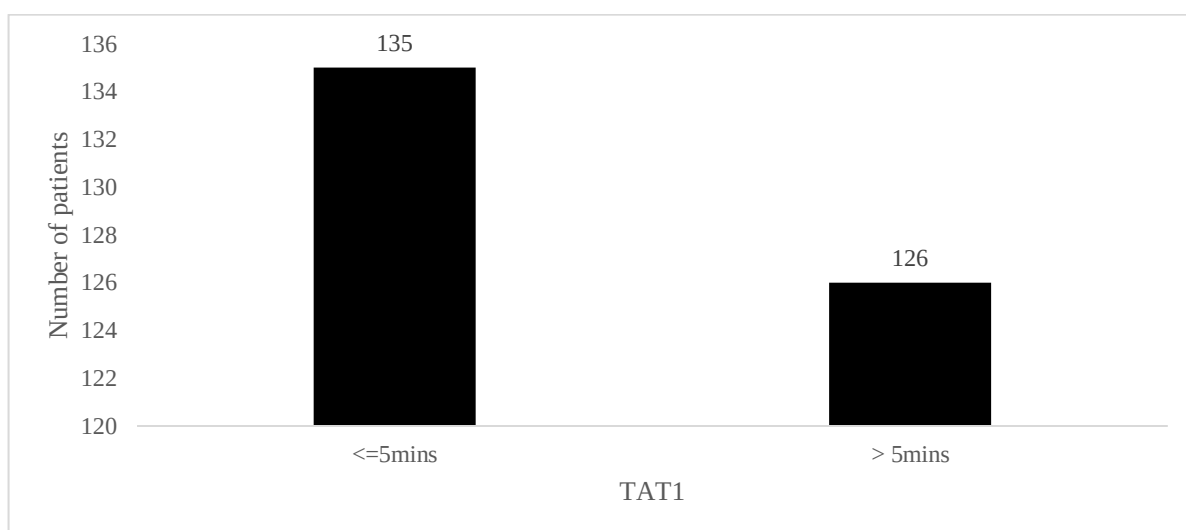


Fig 5.2 Distribution of OPD patients according to TAT1 compliance (n=261)

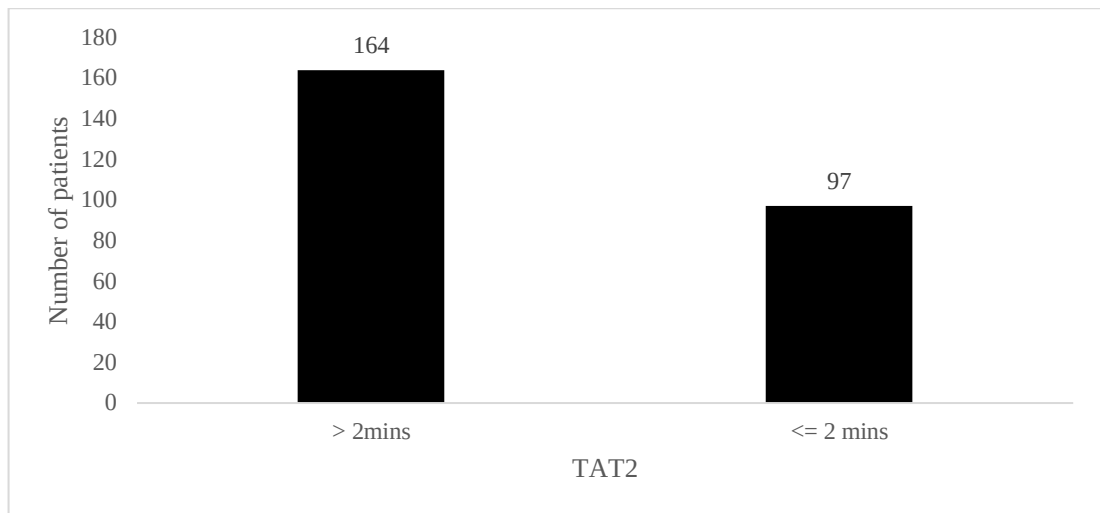


Fig 5.3 Distribution of OPD patients according to TAT2 compliance (n=261)

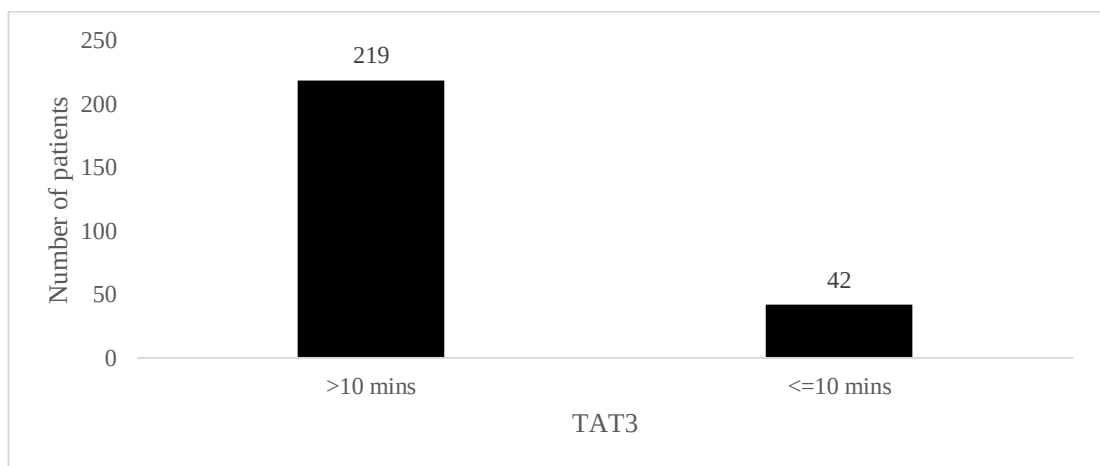


Fig 5.4 Distribution of OPD patients according to TAT3 compliance (n=261)

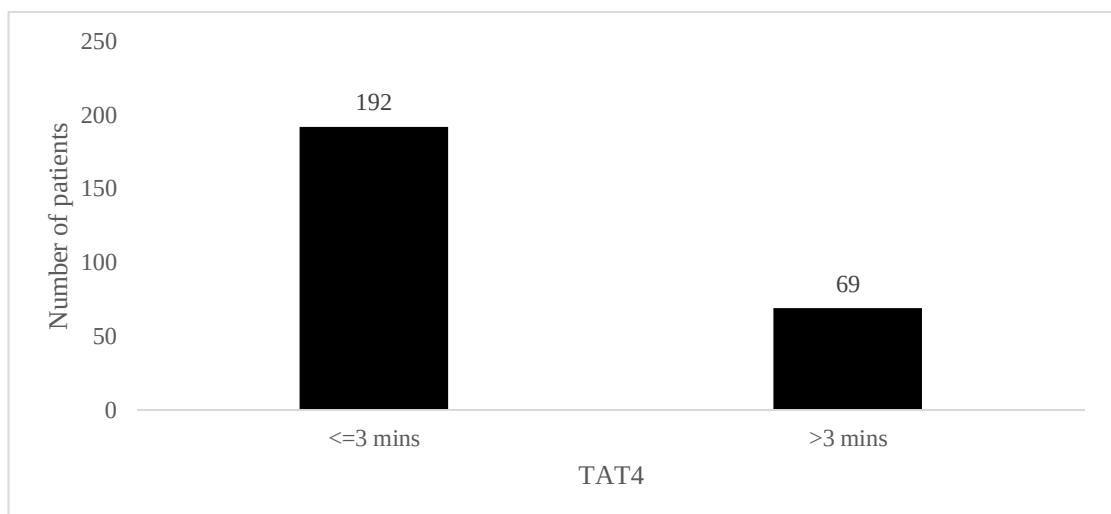


Fig 5.5 Distribution of OPD patients according to TAT4 compliance (n=261)

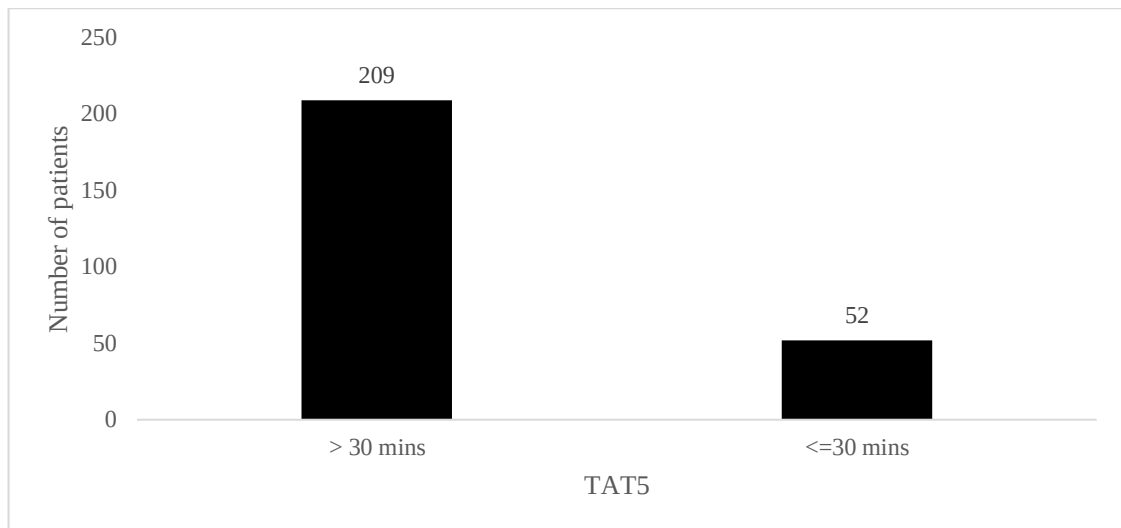


Fig 5.6 Distribution of OPD patients according to TAT5 compliance (n=261)

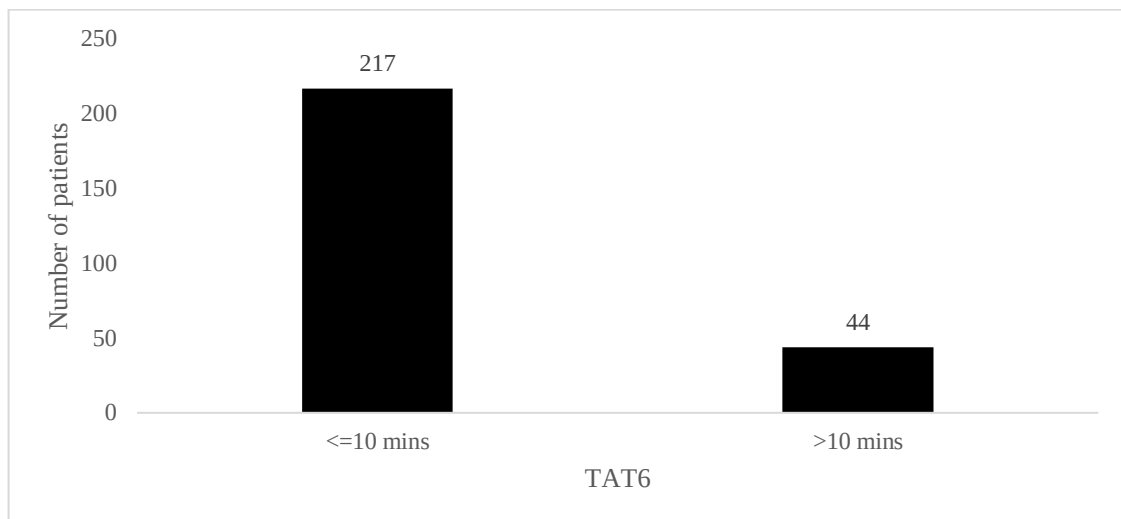


Fig 5.7 Distribution of OPD patients according to TAT6 compliance (n=261)

Table 5.3 Distribution of OPD patients according to their compliance to Ideal process TAT,Waiting time and Overall TAT*	
Process TAT	Percent
<=15 mins	75.9
>15 mins	24.1
Waiting Time	
<=45 mins	18.4
>45 mins	81.6
Overall TAT	
<=60 mins	13.8
>60 mins	86.2
*Ideal process TAT<=15 mins Ideal Waiting time<=45 mins Ideal Overall TAT<=60 mins	

The analysis of the process TAT, waiting time and overall TAT (Table 5.3) revealed that, more than three-fourths of the patients met the ideal process TAT (76%). More than four-fifths of the patients exceeded ideal waiting time (82%). Overall, 86 percent of the patients exceeded the ideal overall TAT.

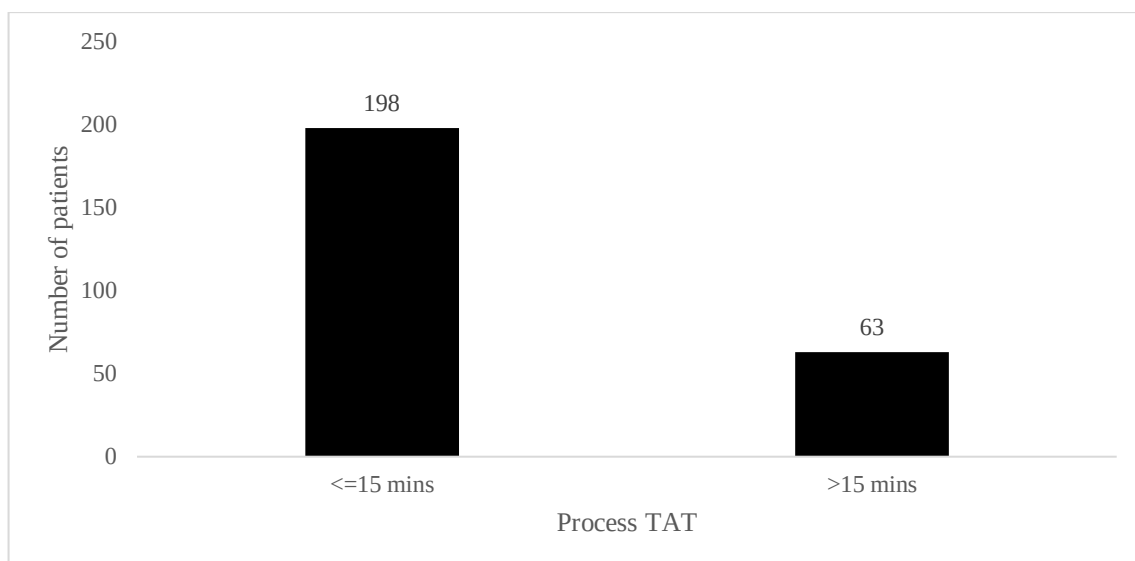


Fig 5.8 Distribution of OPD patients according to Process TAT compliance (n=261)



Fig 5.9 Distribution of OPD patients according to their compliance with the Ideal Waiting time (n=261)

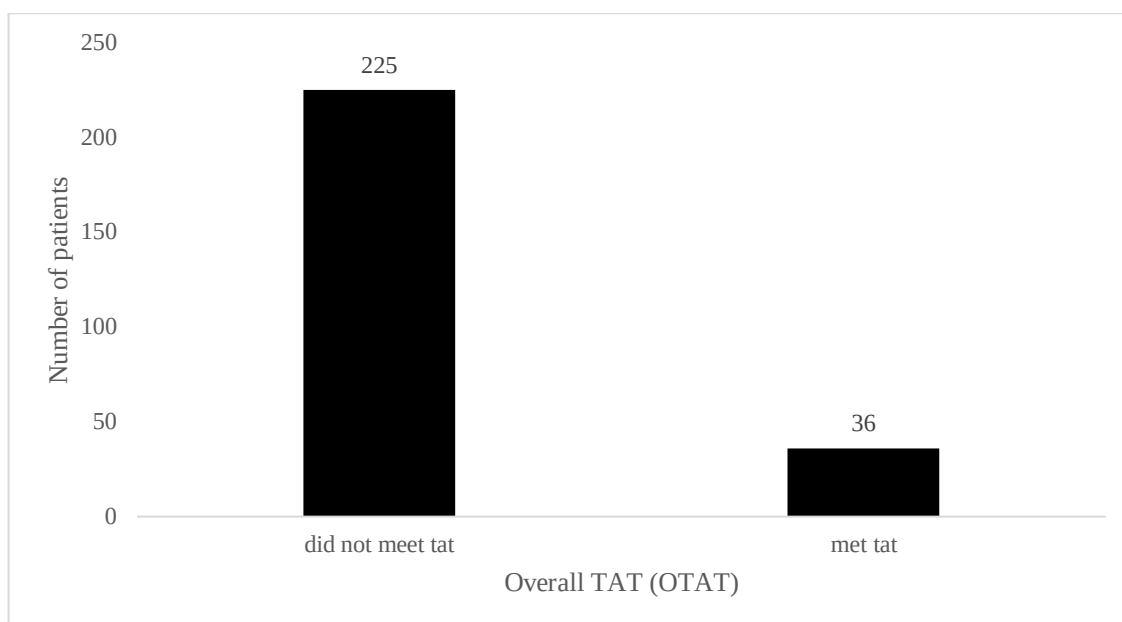


Fig 5.10 Distribution of OPD patients according to their compliance with OTAT (n=261)

Variable	Median (in mins)	IQR (in mins)	Minimum (in mins)	Maximum (in mins)
TAT1	5.00	8	0	40
TAT2	3.00	2	0	23
TAT3	18.00	11	0	150
TAT4	2.00	2	1	12
TAT5	66.50	77	0	225
TAT6	6.00	4	1	25
Process TAT	12.00	5	4	39
Waiting Time	90.00	79	0	261
OTAT	106.00	80	5	275

Variable	Number of cases that met Ideal TAT	Total	P value
Department			0.006**
Cardiology	5	75	
Dermatology	0	3	
Endocrinology	0	7	
ENT	3	8	
Gastroenterology	0	9	
Gynaecology	0	1	
Internal Medicine	12	40	
Nephrology	0	20	
Neurology	8	39	

Orthopedic	3	24	
Plastic Surgery	0	6	
Pulmonology	1	15	
Urology	4	14	
Payer Type			0.464
Cash	18	124	
CGHS	12	73	
Credit	6	64	
TAT1			0.393
<=5 mins	21	135	
>5 mins	15	126	
TAT2			0.330
<=2 mins	16	97	
>2 mins	20	164	
TAT3			0.002*
<=10 mins	12	42	
>10 mins	24	219	
TAT4			0.833
<=3 mins	27	192	
>3 mins	9	69	
TAT5			<0.001*
<=30 mins	29	52	
>30 mins	7	209	
TAT6			0.015*
<=10 mins	35	217	
>10 mins	1	44	
Process TAT			<0.001*
<=15 mins	36	162	
>15 mins	0	63	
Waiting time			<0.001*
<=45 mins	36	48	
>45 mins	0	213	
*p<0.05 **although a p value of <0.05 is seen, it cannot be considered as 12 cells had frequency of less than 5.			

A Chi-square test was carried out to find the association between departments, payer type, TAT1, TAT2, TAT3, TAT4, TAT5, TAT6, process TAT, and waiting time with the meeting of ideal overall TAT of the 261 patients of CARE Hospitals, Ramnagar, Visakhapatnam. It was observed that five variables i.e, TAT3, TAT5, TAT6, process TAT, and waiting time were found to be statistically significant with meeting the ideal overall TAT.

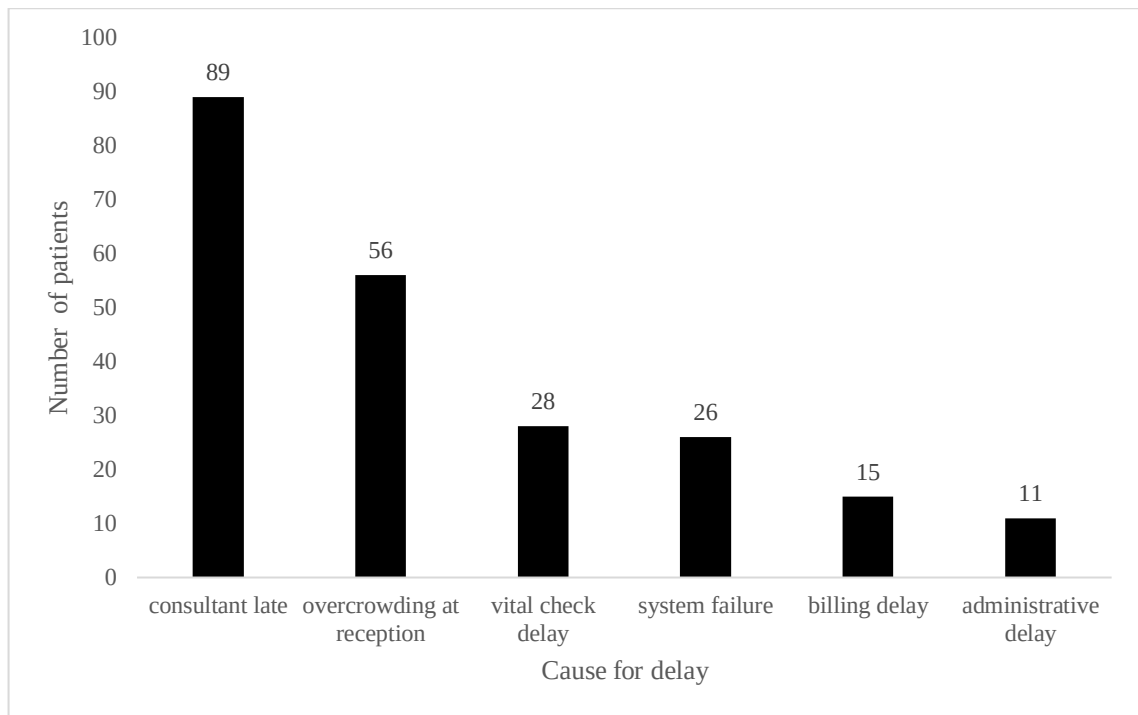


Fig 5.11 Common complaints encountered that contributed to delay (n=225)

Out of the 225 patients that exceeded the ideal OTAT, two-fourths of the patients were delayed due to late arrival of the consultant (40%). Following that, the most common cause of delay was due to overcrowding at reception, delay in getting called to the nurse station and due to software or system-related failure at the OPD reception.

Chapter 6- DISCUSSION

In the present study, it was observed that a total of 225 patients experienced a waiting period exceeding 60 minutes in the outpatient department (OPD) before receiving their required consultation. The average waiting time recorded among these patients was 107 minutes, with an interquartile range (IQR) of 80 minutes (Table 5.4). This finding is in line with the results of a study conducted in Nigeria, where 61 percent of patients reported an OPD turnaround time (TAT) ranging between 90 to 180 minutes ^[18]. Similarly, the average waiting time observed in the OPD of a teaching hospital in Nigeria was noted to be 173 minutes, while in Trinidad and Tobago, the average waiting time stood at 160 minutes ^[19,20].

Such prolonged waiting times in the OPDs of hospitals located in developing countries have largely been attributed to the low doctor-to-patient ratios prevalent in these settings. The significant imbalance between the number of available doctors and the growing patient population makes it exceedingly difficult for health facilities to adhere to the standards recommended by the Institute of Medicine (IOM), which advocate that patients should be attended to within 30 minutes of their scheduled appointment time ^[21].

In the current study, it was further noted that patients received an average consultation time of approximately 5 minutes following an average waiting time that exceeded one hour. The consultation time varied widely, ranging from as short as 1 minute to as long as 25 minutes, which is consistent with findings from two other studies conducted in Nigeria and Malaysia ^[18,22]. Although the present doctor-to-patient ratio stands at 1:834—an improvement compared to the World Health Organization’s (WHO) recommended target of 1:1000—extended waiting times across OPDs continue to remain a major source of dissatisfaction among patients seeking healthcare services ^[13,23].

The major complaints related to delays have been displayed in Fig. 5.11. These delays can be classified based on their functional areas and activities or lapses contributing to such delays.

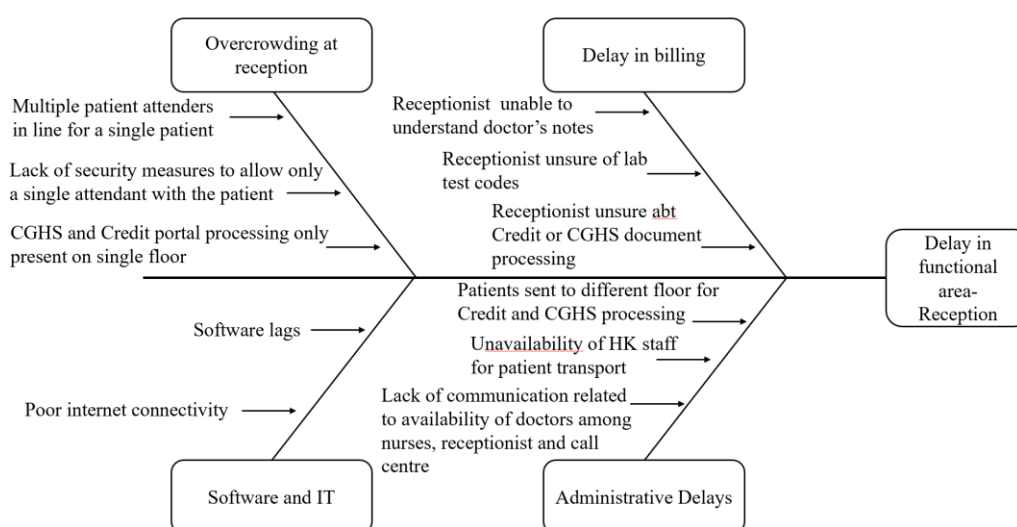


Fig 6.1 Reasons for Delay in OPD Reception

The delays observed at the OPD reception can be attributed to a multitude of operational, infrastructural, and systemic issues that compounded during peak hours. A primary factor contributing to the delay was the additional time spent by reception staff in maintaining crowd discipline. Due to the absence of an efficient queue management system, multiple patients and their attendants would congregate simultaneously at the reception counter. This forced receptionists to temporarily abandon their primary responsibilities, such as billing and registration, to manage and organize the crowd manually. Consequently, valuable time was lost, creating a cascading effect on overall patient processing times.

An operational bottleneck further exacerbated these delays: only a single receptionist possessed the credentials necessary to access and operate the CGHS and Credit portals used for the registration of non-cash patients. This limited access created a significant dependency on one individual, causing registration backlogs during peak periods. Patients often approached the desk repeatedly to inquire about their enrollment status, as billing processes could only be initiated once enrollment was completed. This repeated interaction not only disrupted workflow but also intensified crowding around the reception.

Moreover, the issue of overcrowding was amplified by the frequent presence of multiple attendants accompanying each patient. Typically, two or more attendants would stand alongside a patient in the queue, significantly increasing the number of people occupying the limited reception space. This situation led to extended waiting times, with queues stretching up to 40 minutes during peak hours between 10:30 AM and 11:30 AM (Table 5.4).

Inactive or inadequate security arrangements further aggravated the situation. Security personnel were either absent or passive, resulting in uncontrolled crowd behavior and lack of adherence to queue protocols. Without active oversight, self-regulation by patients and attendants was ineffective, contributing to disorganization and delays.

Technical issues also played a significant role in impeding workflow efficiency. Receptionists consistently reported the slow functioning of the software used for patient registration and billing, particularly during rush hours. Additionally, various hardware-related problems, such as printer malfunctions, depletion of printer cartridges, and intermittent internet/LAN connectivity disruptions, were frequently encountered. Although these issues were often escalated to corporate heads and resolved temporarily within 5 to 10 minutes, their recurring nature meant that disruptions were a routine part of operations, cumulatively impacting patient throughput.

Documentation requirements for non-cash patients also contributed to inefficiencies. Patients were expected to present specific documents at the time of registration; however, no visible signage or information was available near the reception to inform them beforehand. As a result, patients who were unaware of these requirements had to leave the queue, retrieve the necessary documents, and return. Often, these individuals resisted rejoining the end of the line upon return, leading to disputes and further breakdowns in queue maintenance.

Errors in the appointment scheduling process also introduced delays. At times, incorrect patient names were recorded by the nurses responsible for scheduling appointments. When these patients arrived at the OPD, discrepancies had to be manually verified and corrected with the assistance of OPD nurses, delaying the service for others waiting in line.

Additionally, logistical challenges such as the unavailability of wheelchairs for patient transport created bottlenecks at the reception area. Patients who were unable to mobilize independently were forced to wait longer periods for assistance, thereby occupying space and contributing to congestion.

Lastly, communication failures between the call center, nursing staff, and reception compounded patient dissatisfaction and operational delays. Instances where patients had scheduled appointments, only to be informed upon arrival that the concerned doctor was unavailable, triggered grievance redressal processes. Reception staff had to intervene and manage patient complaints, which diverted attention from routine operations and contributed to further crowding and delays.

In summary, the delays at the OPD reception stemmed from a combination of poor queue management, limited operational access for registration, passive security presence, recurrent technical failures, insufficient logistical support, lack of patient communication regarding documentation, and systemic communication breakdowns between different units. These findings highlight the critical need for a multipronged intervention strategy to streamline OPD processes, enhance patient satisfaction, and optimize staff efficiency.

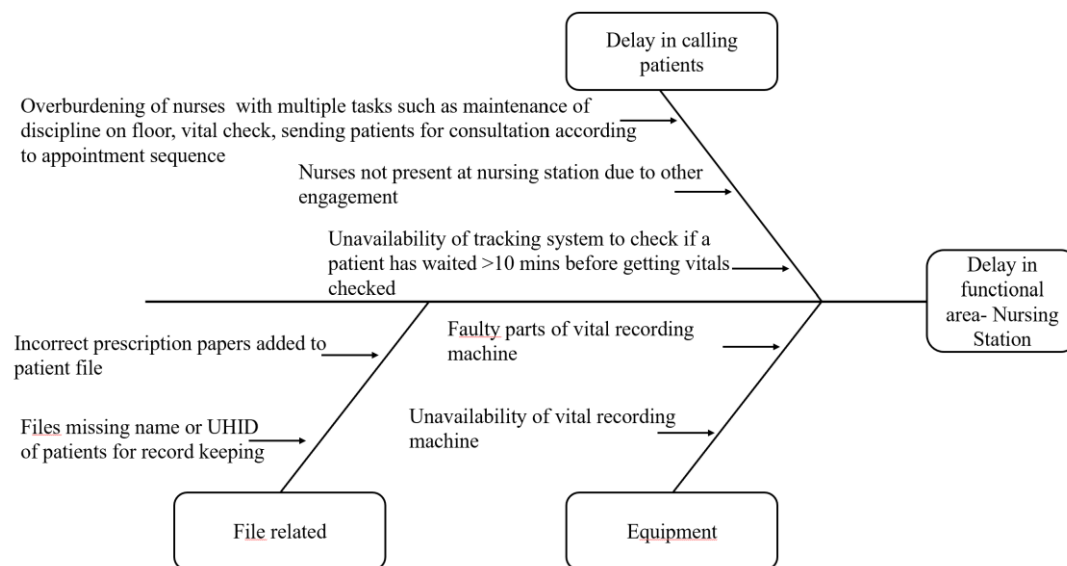


Fig 6.2 Reasons for Delay in OPD Nursing Station

Delays at the nursing station, particularly in relation to the recording of patient vital signs, were observed to be a significant bottleneck in the OPD workflow. A key contributing factor to these delays was the overburdening of nursing staff, who were responsible for managing a wide array of tasks simultaneously. In addition to recording vitals, nurses were tasked with maintaining discipline among patients approaching the nursing station, performing daily data entry regarding the number of patients whose vitals were recorded,

maintaining conversion registers, coordinating with doctors regarding the number of scheduled appointments and patients awaiting consultation, contacting patients for follow-up visits, and managing the appointment sequence for ongoing consultations. This multitasking considerably compromised their availability for the primary task of recording vitals, leading to service inefficiencies.

In several instances, no nurse was physically present at the nursing station to record vital parameters, as they were engaged in other administrative or patient management duties. Furthermore, the quality and availability of medical equipment also contributed to operational delays. For example, faulty blood pressure cuffs, malfunctioning thermometers, and the unavailability of vital recording instruments — often requested by doctors for use inside consultation chambers — disrupted the continuity of vital data recording. Critically, there was also an unavailability of spare equipment to immediately replace defective instruments, thereby compounding delays and forcing staff to either search for replacements elsewhere or temporarily halt vital recording activities.

Compounding these delays were errors in documentation. Upon attempting to record vitals, nurses sometimes encountered discrepancies such as mismatched patient names on prescription notes, missing patient identifiers such as name or Unique Health Identification (UHID) numbers in patient files, or complete absence of documentation. These issues required nurses to return the files to the reception desk to rectify the errors, further interrupting their workflow and extending waiting times for subsequent patients.

In certain cases, it was also observed that nurses prioritized the completion of their pending administrative tasks before attending to patients awaiting vital checks. Although standard operating procedures (SOPs) mandated a 10-minute waiting period before the recording of vitals to ensure more accurate and stabilized readings, the actual waiting time often significantly exceeded this threshold. Due to the overwhelming volume of patients and the absence of a robust patient-tracking mechanism, some individuals were made to wait up to 150 minutes before being called for vital recording (Table 5.4). Alarming, many of these patients were inadvertently overlooked, a situation exacerbated by excessive crowding within the OPD.

These findings suggest not only an overburdened nursing workforce but also critical gaps in workflow management, resource allocation, and queue monitoring systems. The absence of an active mechanism to track and manage patient flow — specifically the duration of wait before vital recording — indicates a systemic inefficiency that directly impacts the quality of patient care. The cumulative effect of these challenges likely contributes to patient dissatisfaction, increased stress among nursing staff, and potential compromise in the quality and accuracy of patient data collection, which could further affect clinical decision-making downstream.

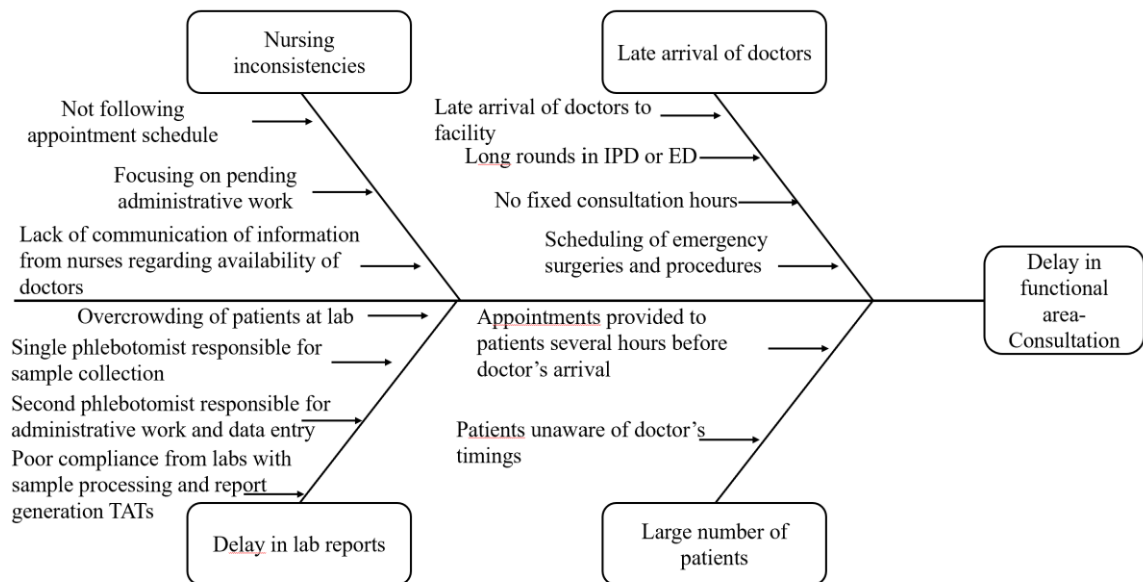


Fig 6.3 Reasons for delay in OPD Consultation

Delays in outpatient department (OPD) consultations were primarily attributed to the delayed arrival of consultants to the OPD. A critical examination of the workflow revealed that the main reasons for these delays stemmed from the engagement of consultants in inpatient department (IPD) rounds and responsibilities in emergency departments. Additionally, the necessity for doctors to frequently shuttle between two or more healthcare centers or units further compounded these delays, adding significant unpredictability to their OPD schedules.

In several instances, consultants were reported to arrive late for OPD consultations due to the sudden scheduling of emergency surgeries or interventions. These procedures often extended well beyond their designated OPD consultation hours, leading to substantial disruptions in the appointment flow. Despite a known pattern of delayed arrivals, it was observed that patient appointments continued to be scheduled approximately one hour prior to the actual anticipated arrival time of the consultants. As a result, on busy days, patients often spent upwards of two hours waiting for their consultation without being adequately informed about the reasons for the delay.

A critical gap in patient communication was noted, particularly regarding the dissemination of information about consultant arrival times. Neither the reception staff nor the nursing personnel consistently communicated the expected waiting time to patients. In cases where consultants were engaged in emergency procedures, the nursing staff often had no real-time updates regarding the consultant's availability, leaving patients and their attendants uncertain and increasingly dissatisfied with the service delivery.

Another key contributor to consultation delays was the dependency on laboratory investigations. Several consultations were contingent upon the availability of diagnostic test results following sample collection. In such cases, unless the required reports were available, proceeding with the consultation held little clinical value. Consequently, patients were made to wait until all relevant reports were generated and verified. This

delay was largely dependent on the operational efficiency and turnaround time of ancillary departments, particularly the laboratory services, thus introducing an external factor that directly influenced OPD flow.

Moreover, during periods of high patient influx or "rush days," nursing staff were tasked with not only managing and maintaining the appointment schedule but also handling a multitude of other administrative and clinical functions. The necessity to juggle multiple responsibilities often led to communication lapses, scheduling errors, and organizational disruptions on the OPD floor. These operational inefficiencies significantly contributed to patient dissatisfaction and sometimes led to visible chaos and discomfort within the waiting areas.

Instances were observed where nurses failed to adhere to the scheduled appointment order. Notably, when questioned regarding such deviations, no clear or documented rationale was provided by the nursing staff. This lack of transparency and consistency further exacerbated patient frustration, undermining trust in the hospital's operational processes.

Additionally, although the expected average consultation time per patient was found to be around six minutes (refer Table 5.4), certain consultations extended beyond the planned duration, particularly in cases involving complex clinical discussions or patient queries. Extended consultation times inevitably created a ripple effect, resulting in cumulative delays for subsequent patients. While most patients did not raise complaints regarding the time allocated for their individual consultation, a mismatch between the prolonged waiting time and the brief nature of the eventual consultation posed a significant risk to hospital reputation and patient satisfaction. Specifically, when a patient endured a waiting period exceeding one hour only to experience a brief six-minute consultation, it often led to feelings of dissatisfaction, perceived neglect, and erosion of trust in the healthcare institution's commitment to quality care.

Thus, the delays in OPD consultations were not the result of a single factor but rather an interplay of multiple systemic, administrative, and clinical inefficiencies. Addressing these issues will necessitate a comprehensive, multi-pronged strategy focusing on better coordination between departments, dynamic and realistic scheduling systems, real-time communication mechanisms, optimization of human resources, and a patient-centered approach to service delivery.

In addition to the previously discussed factors, it is important to highlight that a certain degree of delay in completing various tasks across functional areas of the OPD was attributed to language barriers. The majority of the staff were predominantly fluent in Telugu, with only a limited number of personnel possessing proficiency in Hindi and Odia. This linguistic limitation significantly hindered communication with patients who were not conversant in Telugu, leading to the unnecessary prolongation of otherwise simple and routine procedures.

Furthermore, the lack of sufficient multilingual signage throughout the OPD premises compounded this issue. It was observed that signage was predominantly available only in English, with no systematic inclusion of regional languages such as Telugu, Hindi, or

Odia. Given that a substantial proportion of patients visiting the facility came from neighboring regions of Odisha and considering that Visakhapatnam (Vizag) is a metropolitan city with a sizeable population from various non-Telugu speaking backgrounds, the need for signage in multiple languages becomes even more critical to facilitate ease of navigation for all patient groups. The patient population at the hospital was highly diverse, ranging from government employees covered under formal insurance schemes to patients belonging to the below poverty line (BPL) category, many of whom had limited literacy and comprehension skills in English.

As a result, patients frequently found themselves compelled to interrupt the workflow of the clinical and administrative staff to seek clarification regarding directions, procedures, and next steps. Such interruptions not only delayed service delivery for individual patients but also cumulatively contributed to the overall inefficiency of OPD operations.

Addressing these language and communication barriers is essential for enhancing operational efficiency, improving patient flow, and ensuring a more patient-centered care experience. Future efforts to mitigate OPD delays should therefore also prioritize the inclusion of multilingual support systems, provision of adequate staff training in basic patient communication across languages, and the installation of clear, multilingual signage to promote seamless and independent navigation for all patients, irrespective of their linguistic or socio-economic background.

Chapter 7- RECOMMENDATIONS

Upon meticulous evaluation of the outpatient department (OPD) workflows, patient movement patterns, registration processes, and interdepartmental coordination during the study period, a number of operational, infrastructural, and processual shortcomings were identified that cumulatively contributed to delays, dissatisfaction, and inefficiencies in service delivery. In light of these findings, it is imperative to propose a structured, comprehensive set of recommendations aimed at systematically addressing each identified gap.

Firstly, at the point of first patient contact, namely the reception and billing counters, it was observed that the existing systems are prone to frequent congestion, technical failures, and communication bottlenecks. It is therefore recommended that an intensive, competency-based training program be instituted for all reception and billing staff. This training must encompass not only operational aspects such as efficient billing, appointment scheduling, and real-time software navigation but should also be expanded to include modules on clinical terminology, diagnostic test coding, error-free data entry practices, and basic patient grievance redressal techniques. A periodic assessment of staff performance through role-playing exercises and mock scenarios must be incorporated to ensure that the training translates into improved on-ground performance.

Furthermore, it is suggested that a preventive maintenance schedule for all reception hardware and software infrastructure be established and rigorously adhered to. Particular attention must be paid to the hospital's landline communication system, given its central role in patient information dissemination, and telephonic query resolution. It is imperative that all landline systems be regularly maintained, tested for operational integrity, and that a secondary communication protocol (such as call forwarding to a mobile number) be established for situations involving line failure, ensuring that patient calls are attended to without interruption.

Although barcode scanners are not currently in use within the facility, the generation of a unique barcode for each registered patient presents an immediate opportunity for technological enhancement. It is strongly recommended that a barcode scanning system be introduced at all key registration and consultation points. The use of barcode scanners would eliminate the need for manual entry of patient identifiers, thereby reducing typographical errors, speeding up file retrieval, and enhancing overall workflow efficiency. Manual entry should be limited only to exceptional cases where patients misplace or forget their files, which, based on current observations, represent a very small subset of the OPD population. The introduction of such a system would align the hospital's processes with contemporary best practices in healthcare information management, while also setting a strong foundation for future expansions such as electronic medical records (EMR) integration.

In terms of improving patient preparedness before reaching the reception counters, it is recommended that multilingual, visually intuitive signage be installed at strategic points within the hospital premises. Such signage should clearly specify required documentation

for different categories of patients — including CGHS patients, corporate patients, and direct payers — in languages commonly spoken in the catchment area, notably English, Telugu, Hindi, and Odia. This intervention is particularly important considering the hospital's geographical location in Vizag, a city characterized by significant linguistic diversity. Failure to address language barriers not only slows down the registration process but also fosters confusion, frustration, and unnecessary patient back-and-forth movements.

In addition to static signage, it is advised that a cadre of trained volunteers be introduced within the OPD floor. These individuals should be specifically tasked with assisting patients in going through or understanding registration processes, guiding them to appropriate counters, verifying the completeness and correctness of documents prior to billing, and answering basic non-clinical queries. By offloading non-critical tasks to navigators, frontline reception staff can dedicate their full attention to billing, thereby expediting service and reducing error rates.

With regard to patient appointment scheduling, it is recommended that time slots be allocated with greater alignment to consultant availability. Patients should be called for appointments within a maximum of 30 minutes of the consultant's documented OPD start time. The current practice of allotting appointments without accounting for doctor arrival, surgeon availability, or surgical schedule spillover results in early arrivals, overcrowding, and prolonged waiting periods even before consultations commence. Appointment scheduling personnel, especially those handling telephone bookings, must be trained to verify doctor schedules dynamically and exercise cautious discretion while offering appointment slots, ensuring accuracy in patient demographics, contact information, and consultation requirements.

In the domain of nursing services, it was evident that absence of nursing staff at nursing counters led to unattended patient files and disrupted patient flow. To address this, it is strongly recommended that staffing protocols be amended to mandate the continuous presence of at least one nurse at the designated OPD nursing desk throughout operational hours. Upon receipt of a patient file, the nurse must log the exact time of receipt and proceed to record vital signs within a maximum time frame of 10 minutes. Essential monitoring equipment including sphygmomanometers, thermometers, and weighing scales must be subjected to strict preventive maintenance, calibration, and ready availability protocols to support this objective.

Moreover, to foster a patient-centric environment, nurses must be trained and sensitized to assist in proactive patient engagement rather than redirecting all queries to the reception. During peak OPD hours, non-urgent administrative documentation such as register updates or follow-up calls should be temporarily deprioritized to ensure maximum clinical responsiveness.

Appointment sequencing was another critical concern identified. Breaching of appointment order without legitimate clinical justification generates perceptions of unfairness and intensifies patient grievances. Therefore, it is recommended that nurses receive structured training in basic triage principles, enabling them to appropriately

identify genuine medical emergencies warranting deviation from the appointment queue. Clear, consistent, and empathetic communication with patients regarding any deviation from appointment order must be made mandatory to maintain transparency and trust.

Doctor availability was another factor significantly influencing patient wait times. While emergency procedures understandably necessitate occasional deviation from scheduled OPD timings, it is recommended that elective surgical procedures be strategically planned on days with traditionally lower OPD load based on historical data. Consultants must be encouraged to coordinate with OPD administration regarding their availability so that patients can be informed of any expected delays at the earliest opportunity. Real-time communication between inpatient surgical teams and the OPD reception must be institutionalized as a standard operating protocol, minimizing patient uncertainty and facilitating options such as rebooking or alternate consultation referrals where appropriate.

Furthermore, consultants must be sensitized towards the necessity of allocating adequate consultation time, particularly for patients who have experienced extended waiting periods. Quality of interaction, empathetic listening, detailed explanation of diagnosis and management plans should be prioritized to counterbalance earlier dissatisfaction caused by waiting, thus preserving overall patient trust and institutional reputation.

Interdepartmental coordination between nursing, laboratory, diagnostic imaging, and support services such as housekeeping emerged as another area in need of systemic strengthening. It is recommended that clear departmental Turnaround Time (TAT) benchmarks be established and regularly monitored through digital dashboards or manually maintained logbooks. Regular monthly meetings involving representatives from each department must be institutionalized to review TAT compliance, troubleshoot systemic bottlenecks, and share best practices for rapid service recovery.

The OPD physical environment also warrants significant attention. Considering the demographic profile of the hospital's patients — which includes a significant proportion of elderly individuals— it is essential that adequate seating arrangements be ensured during peak hours. The deployment of easily stackable chairs and wheelchair parking bays across waiting zones can mitigate physical discomfort and reduce agitation. Enforcement of a one-attender-per-patient policy should be undertaken with sensitivity, allowing for exceptions in cases involving dependent patients, while maintaining overall OPD floor decongestion.

Lastly, the absence of multilingual communication at key touchpoints — registration counters, diagnostic departments, consultation rooms — was found to be a recurrent impediment to smooth patient navigation and service utilization. To redress this, it is recommended that all critical hospital communication material be standardized in four languages — English, Telugu, Hindi, and Odia. Additionally, the deployment of multilingual information kiosks and digital navigational aids should be considered as a medium-term infrastructural investment. Where feasible, multilingual patient navigators should be recruited to bridge communication gaps and enhance the overall patient experience

Chapter 8- CONCLUSION

The present study, conducted at CARE Hospitals, Ramnagar, Visakhapatnam, meticulously analyzed the existing workflows, patient movement patterns, registration protocols, and interdepartmental coordination mechanisms within the Outpatient Department (OPD) to assess operational efficiency, time delays, and patient service quality. In light of the increasing demand for streamlined and patient-centered outpatient services in tertiary CARE Hospitals, this research has brought to the forefront several critical gaps and inefficiencies that directly impact patient experience and institutional credibility.

At its core, the study revealed that delays in OPD service delivery are not attributable to a single factor but are instead a cumulative outcome of interlinked operational, infrastructural, and processual deficiencies. Through structured data collection, time-motion analysis, direct observations, and stakeholder interviews, a holistic picture of the OPD ecosystem emerged—underscoring both symptomatic inefficiencies (such as prolonged waiting periods, inconsistent appointment sequencing, and communication breakdowns) and systemic root causes (such as staffing inconsistencies, technological limitations, and inadequate coordination between departments).

A significant finding pertains to the discrepancy between patient appointment timings and consultant availability. The analysis revealed that patients were often called to the OPD well in advance of the consultant's actual availability, leading to unnecessary crowding, extended waiting periods, and heightened patient frustration. This disconnect was found to be especially prominent in cases involving surgeons, where surgical spillover disrupted the outpatient schedule. Such misalignment not only undermines patient satisfaction but also exerts pressure on frontline OPD staff, resulting in communication bottlenecks and a chaotic service environment.

The study also highlighted notable inefficiencies at the registration and billing counters, which represent the first point of contact for patients. Frequent technical failures, limited patient awareness about required documentation, and language barriers contribute to confusion and delay. Real-time coordination between reception, nursing, and diagnostic teams was observed to be lacking. Moreover, the absence of functional landline systems for telephonic appointment queries and follow-ups further exacerbates communication challenges due to involvement of too many intermediaries. Lack of a functional landline system also created a barrier for patients who lacked digital literacy to obtain the information they needed and obtain appointments before approaching the hospital.

Another area of concern was the inconsistent presence of nursing personnel at the OPD nursing desks, which disrupted the timely recording of vital signs and delayed the forwarding of patient files to consultants. In instances where nursing staff were engaged in parallel documentation tasks or administrative work, patients were left unattended, resulting in workflow stagnation. In a high-throughput OPD like that of CARE Hospitals, the continuous presence of trained nurses at designated points is essential not only for maintaining clinical flow but also for ensuring patient safety and operational discipline.

The study further noted that interdepartmental coordination—especially between the OPD, laboratory services, radiology departments, and support services like housekeeping—was marked by fragmentation and the absence of defined turnaround time (TAT) protocols. Delays in patient file movement, delayed report availability, and miscommunication between departments created operational bottlenecks that often went unnoticed by higher management due to the absence of a structured monitoring framework.

Equally critical was the physical infrastructure of the OPD, which does not adequately cater to the needs of elderly patients or those requiring mobility assistance. During peak hours, limited seating, narrow passageways, and the unrestricted presence of multiple attenders per patient contributed to space congestion and operational inefficiency. The lack of wheelchair parking zones and intuitive navigational signage further hindered patient mobility and increased their dependency on already overburdened staff.

From a patient-centric perspective, perhaps the most recurrent theme in the study was the language barrier and poor communication at key touchpoints. Vizag being a linguistically diverse city, patients speaking Telugu, Hindi, Odia, and English converge at CARE Hospitals. The unavailability of multilingual signage and support systems created confusion, especially at the registration desks, diagnostic areas, and consultation rooms. In the absence of multilingual communication strategies, patients were often forced to rely on co-attenders or struggled independently to understand procedures, thereby amplifying stress and dissatisfaction.

In response to these findings, a comprehensive set of recommendations was formulated, as outlined in Chapter 7. These recommendations were not generic but specifically tailored to the operational realities of CARE Hospitals, incorporating both immediate and medium-term interventions. For instance, the introduction of barcode scanning systems at registration and consultation points was proposed to streamline patient identification, minimize manual entry errors, and pave the way for eventual EMR integration. Similarly, the deployment of trained volunteers or navigators was suggested as a mechanism to offload non-clinical tasks from reception and nursing staff, thereby increasing overall service efficiency.

Furthermore, the study emphasized the importance of competency-based training modules for OPD receptionists, billing staff, and nurses. Such training should not only cover technical competencies (e.g., accurate billing, software use, triage skills) but also incorporate soft skills such as empathetic communication, grievance redressal, and basic medical literacy. These human-centered interventions are crucial for fostering a service culture rooted in efficiency, empathy, and professionalism.

The study also advocated for the establishment of a preventive maintenance schedule for all OPD hardware and communication systems, including the hospital landline and patient data management infrastructure. Equally important is the strategic planning of consultant schedules in alignment with OPD load to avoid overlap between surgical and outpatient duties. Institutionalizing real-time communication protocols between the OT and OPD

teams was recommended to enhance transparency, manage patient expectations, and provide alternative options (e.g., rebooking or referrals) when delays are unavoidable.

Finally, the research reiterated the necessity of institutional mechanisms for monitoring interdepartmental performance, such as monthly review meetings, digital dashboards tracking TAT benchmarks, and best practice sharing forums. Such platforms would ensure that systemic gaps are not just patched temporarily but resolved through cross-functional collaboration and continuous improvement.

In conclusion, this study has demonstrated that enhancing OPD efficiency at CARE Hospitals requires a multi-pronged, patient-centered, and systemically integrated approach. Addressing isolated inefficiencies without reforming the larger workflow architecture will yield limited results. Conversely, the strategic implementation of the proposed recommendations—grounded in evidence, field observations, and stakeholder insights—has the potential to significantly transform outpatient service delivery. This transformation is not merely operational but also cultural, signaling a shift towards greater accountability, responsiveness, and patient satisfaction.

As healthcare institutions increasingly operate under pressures of volume, cost-efficiency, and patient expectations, CARE Hospitals stands at a critical juncture. By committing to the reforms suggested in this research, the hospital can not only enhance its operational efficiency and clinical outcomes but also reinforce its reputation as a patient-first institution in the highly competitive landscape of tertiary healthcare in urban India.

REFERENCES:

1. Mital, K., 2010. Queuing analysis for outpatient and inpatient services: a case study. *Management Decision*, 48(3), pp. 419-439.
2. Al-Zain, Y., Al-Fandi, L., Arafeh, M., Salim, S., Al-Quraini, S., Al-Yaseen, A. and Abu Taleb, D., 2019. Implementing lean six sigma in a Kuwaiti private hospital. *International Journal of Health Care Quality Assurance*, 32(2), pp. 431-446.
3. Benevento, E., Aloini, D., Squicciarini, N., Dulmin, R. and Mininno, V., 2019. Queue-based features for dynamic waiting time prediction in emergency department. *Measuring Business Excellence*, 23(4), pp. 458-471.
4. Biya, M., Gezahagn, M., Birhanu, B. *et al.* Waiting time and its associated factors in patients presenting to outpatient departments at Public Hospitals of Jimma Zone, Southwest Ethiopia. *BMC Health Serv Res* 22, 107 (2022). <https://doi.org/10.1186/s12913-022-07502-8>
5. Munavalli, J., Rao, S., Srinivasan, A., Manjunath, U. and van Merode, G., 2017. A robust predictive resource planning under demand uncertainty to improve waiting times in outpatient clinics. *Journal of Health Management*, 19(4), pp. 563-583.
6. Barlow, G., 2002. Auditing hospital queuing. *Managerial Auditing Journal*, 17(7), pp. 397-403.
7. Willoughby, K., Chan, B. and Strenger, M., 2010. Achieving wait time reduction in the emergency department. *Leadership in Health Services*, 23(4), pp. 304-319.
8. Haussmann, R. K. Waiting time as an index of quality of nursing care, *Health service research*, McKinsey and Company, New York. 1970; 93-105.

9. Srinivasan P. National Health Policy for Traditional Medicine in India. World Health Forum. 1995; 16:190±193. PMID: 7794464

10. Jaggi OP. Medicine in India: modern period. Oxford University Press, 2000.

11. Oanh TTM, Tuan KA, Phuong H, Phuong NK, Due OT, Hort K. Public hospital governance in Viet Nam: a case study in two provinces. In: *Public Hospital Governance in Asia and the Pacific*, edited by Huntington D and Hort K. pp. 98–136, 2015, World Health Organization, Geneva.

12. Ministry of Health and Joint Partnership Group. Improving quality of medical services. 2010 (in Vietnamese) Available at: http://jahr.org.vn/downloads/JAHR2012/JAHR2012_Eng_Full.pdf?phpMyAdmin=5b051da883f5a46f0982ccc60527c597. Accessed August 1, 2017.

13. Kaur R, Kant S, Goel AD, Sharma N. Patient Satisfaction Among the OPD Attendees at a Secondary CARE Hospitals in Northern India. J Patient Exp. 2022 Aug 11;9:23743735221120497. doi: 10.1177/23743735221120497. PMID: 35983017; PMCID: PMC9380211.

14. Huang XM. Patient attitude towards waiting in an outpatient clinic and its applications. Health Serv Manage Res. 1994;7:2–8. doi: 10.1177/095148489400700101. [DOI] [PubMed] [Google Scholar][Ref list]

15. Average ER. Reported by Associated Press; 2008. [Accessed on 7/4/110]. Waiting Time Nears 1 h, CDC Says. Available at: www.oregonlive.com/kiddo/index.../average_er_waiting_time_nears_1h. [Google Scholar][Ref list]

16. Reddy, S., & Mary, I. (2013). Aarogyasri Scheme in Andhra Pradesh, India: Some Critical Reflections. Social Change, 43(2), 245-261. <https://doi.org/10.1177/0049085713492275> (Original work published 2013)

17. Sarwal R. Reforming central government health scheme into a 'universal health coverage' model. *Natl Med J India*. 2015 Jan 1;28(1):29-37.

18. Oche M, Adamu H. Determinants of patient waiting time in the general outpatient department of a tertiary health institution in north Western Nigeria. *Ann Med Health Sci Res*. 2013 Oct;3(4):588-92. doi: 10.4103/2141-9248.122123. PMID: 24380014; PMCID: PMC3868129.

19. Ofilli AN, Ofowve CE. Patient's assessment of efficiency of services at a teaching hospital in a developing country. *Ann Afr Med*. 2005;4:150–3.

20. Ofilli AN, Ofowve CE. What patients want: A content analysis of key qualities that influence patient satisfaction. *J Med Pract Manage*. 2007;22:255–61.

21. O'Malley MS, Fletcher SW, Fletcher RH, Earp JA. Measuring patient waiting time in a practice setting: A comparison of methods. *J Ambul Care Manage*. 1983;6:20–7. doi: 10.1097/00004479-198308000-00006.

22. Hannafi MA. Department of Statistics Malaysia; 2004. [Last accessed 2010 Nov 12]. Study on outpatients' waiting time in Hospital University Kebangsaan Malaysia (HUKM) through the six sigma approach. Available at: http://www.statistics.gov.my/portal/download_journals/files/2005/Volume1/Contents_Article_Hanaffi.pdf

23. Mandaviya M. Doctor-population ratio in country stands at 1:834, Mansukh Mandaviya tells Lok Sabha [Internet]. *The Economic Times*. 2024 Feb 10 [cited 2025 May 5]. Available from: <https://economictimes.indiatimes.com/news/india/doctor-population-ratio-in-country-stands-at-1834-mansukh-mandaviya-tells-lok-sabha/articleshow/107561323.cms?from=mdr>

ANNEXURE-1

[illegible]