

**OPTIMIZING PATIENT FLOW: REDUCING WAITING TIME IN THE  
OUTPATIENT DEPARTMENT (OPD) AT DR. MUKESH BAGHEL  
MULTISPECIALITY HOSPITAL, AGRA**

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

**Deeksha Bhardwaj**

Under the Supervision and Guidance of

**Dr. J.P. Singh**

**2025**

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## CERTIFICATE

This is to certify that Dr. Deeksha Bhardwaj in partial fulfillment of the requirements for the award of the degree of MBA (Hospital and Health Management) from the IIHMR University, Jaipur has successfully completed her internship at Dr. Mukesh Baghel Multispecialty Hospital Pvt. Ltd. during Mar 10 - May 31, 2025.

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## CERTIFICATE

This is to certify that dissertation titled “ **Optimizing Patient Flow: Reducing waiting Time In The Outpatient Department (OPD) At Dr. Mukesh Baghel Multispeciality Hospital, Agra** ” is a record of the research work undertaken by **Deeksha Bhardwaj** in partial fulfilment of the requirements for the award of the degree of MBA (Hospital and Health Management) from the IIHMR University, Jaipur under my guidance and supervision and her approach to the research study has been sincere, scientific, and analytical.

*Jagjeet Prasad Singh*  
Faculty Guide

IIHMR University, Jaipur

Date *6/6/2025*

A handwritten signature in blue ink, appearing to be 'S. D.', with a horizontal line underneath.

School Dean

IIHMR University, Jaipur

Date

## DECLARATION BY STUDENT

I hereby declare that this dissertation titled **Optimizing Patient Flow: Reducing Waiting Time in the Outpatient Department (OPD) at Dr. Mukesh Baghel Multispecialty Hospital, Agra** 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 Information derived from the published or unpublished work of others has been duly acknowledged in the text.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) Deeksha

Name of Student DEEKSHA BHARDWAJ

Date 06-06-25

## **Abstract**

### **Background:**

Outpatient Department (OPD) waiting times are a persistent challenge in healthcare systems, often leading to decreased patient satisfaction and inefficient service delivery. Long wait times can compromise the quality of care, patient trust, and overall hospital reputation, especially in high-volume tertiary care settings.

### **Objective:**

The primary objectives of this study are to evaluate the existing waiting times and pinpoint key areas of delay within OPD services, to assess patient experiences and satisfaction levels in relation to these delays, and to propose targeted workflow improvements that can enhance the overall efficiency and effectiveness of OPD operations.

### **Methodology:**

A cross-sectional observational study was conducted at Dr. Mukesh Baghel Multispecialty Hospital, Agra. Data was collected over a defined period using direct observations, staff interviews, and review of hospital records. A time-motion study approach was adopted to track and document each step of the OPD discharge process. The sample included patients undergoing discharge, and quantitative data was analyzed using descriptive statistics and comparative analysis to identify process bottlenecks.

### **Results:**

The study found that the average OPD visit took 55 minutes, with the longest waiting time for doctor consultation. Only 42% of patients were satisfied with the process. A strong negative correlation was observed between waiting time and patient satisfaction ( $r = -0.62$ ,  $p < 0.001$ ), indicating that longer waits led to lower satisfaction. Major issues included delays, confusion, and overcrowding.

### **Conclusion:**

The study highlights critical inefficiencies in the OPD discharge process that directly affect patient experience and hospital workflow. Strategic interventions such as automation, improved interdepartmental communication, and standardized discharge protocols can significantly reduce waiting times and enhance patient satisfaction. The

findings serve as a valuable input for hospital management to redesign OPD workflows and promote patient-centered care.

**Keywords:**

OPD waiting time, Patient flow optimization, Workflow analysis, Hospital management, Patient satisfaction, Time-motion study

## ACKNOWLEDGEMENT

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## **Chapter 1**

### **Introduction**

## Background

Outpatient Departments (OPDs) plays a pivotal role in modern healthcare delivery systems. They act as the first point of contact for patients who are seeking medical consultation, follow-ups, or diagnostic services without requiring hospitalization<sup>1</sup>. The efficiency of OPDs is critical to ensuring a positive patient experience, maintaining clinical quality, and optimizing hospital resources<sup>2</sup>.

Globally, prolonged waiting times in OPDs remain a significant concern, linked to patient dissatisfaction, increased operational costs, staff burnout, and missed opportunities for early diagnosis and treatment<sup>3</sup>. In India, especially in tier-2 cities and semi-urban areas, increasing patient loads strain healthcare infrastructure and human resources, worsening these challenges<sup>4</sup>.

Dr. Mukesh Baghel Multispecialty Hospital in Agra, a leading private healthcare provider, manages an average daily OPD patient load of approximately 1,200. Recent hospital records indicate that during peak hours, patients experience an average waiting time of 90 to 110 minutes from registration to consultation. This delay is compounded by inefficient appointment scheduling, manual registration processes, and communication gaps between departments. Moreover, a recent internal patient satisfaction survey revealed that nearly 35% of OPD patients expressed dissatisfaction specifically regarding waiting times and administrative delays<sup>5</sup>.

These operational inefficiencies not only impact patient satisfaction but also pose risks to clinical outcomes. Delays in timely consultations can lead to worsening health conditions, decreased patient adherence to treatment, and erosion of trust in healthcare services<sup>6</sup>. Given the hospital's prominent role in providing tertiary care in Agra and its growing patient base, there is an urgent need to address OPD workflow challenges to enhance care delivery and patient safety.

This study is therefore being conducted at Dr. Mukesh Baghel Multispecialty Hospital to identify root causes of delay within its OPD processes, and to design targeted interventions for workflow optimization. The hospital's size, patient volume, and current operational challenges make it an ideal setting for such an investigation, with potential to develop a scalable model for similar private hospitals in tier-2 cities facing analogous issues.

## **Purpose of the study**

The primary purpose of this study is to critically evaluate the current outpatient workflow at Dr. Mukesh Baghel Multispecialty Hospital, with a focus on identifying bottlenecks contributing to prolonged waiting times and patient dissatisfaction. By analyzing patient flow, registration processes, appointment scheduling, and interdepartmental coordination, the study aims to design and implement targeted interventions that optimize efficiency and reduce delays.

Given the hospital's large daily OPD volume of over 1,200 patients and documented average wait times exceeding 90 minutes, this research seeks to develop a practical, data-driven framework tailored to the hospital's operational realities. Furthermore, the study will assess the impact of integrating digital tools and administrative reforms to enhance communication and patient management.

This study also intends to:

- Provide actionable insights into the unique challenges faced by private hospitals in tier-2 Indian cities like Agra.
- Bridge the gap between theoretical workflow models and real-world application within this hospital setting.
- Develop a replicable OPD optimization model that can be adapted by similar institutions striving to improve outpatient services.

## **Significance of the Study**

This study holds considerable importance for healthcare practitioners, hospital administrators, and policymakers. Improving OPD efficiency at Dr. Mukesh Baghel Multispecialty Hospital can lead to reduced patient wait times, enhanced patient satisfaction, and better health outcomes. Specifically, the findings will:

- Enable the hospital to create a sustainable, evidence-based OPD management strategy, addressing current issues such as prolonged waiting and inefficient scheduling.
- Contribute valuable insights to the limited research on OPD workflow optimization within private hospitals in tier-2 cities, an underexplored area in healthcare management literature.
- Offer a scalable model incorporating technological and process improvements that other hospitals in similar contexts can implement.

- Encourage patient-centered administrative practices by incorporating patient feedback into ongoing quality improvement efforts, fostering trust and improving care experiences.

### **Scope of the Study**

This study focuses exclusively on the Outpatient Department (OPD) services at Dr. Mukesh Baghel Multispecialty Hospital, Agra. It involves patients, doctors, nurses, and administrative personnel directly engaged in outpatient care processes. The research will cover both pre-intervention and post-intervention phases to evaluate the effectiveness of implemented changes. The scope is limited to non-emergency OPD cases, excluding inpatient, surgical, and emergency services to maintain a focused and manageable study framework.

### **Limitations of the Study**

- The research is confined to a single private hospital in Agra, which may limit the generalizability of findings to other healthcare settings or public hospitals.
- The study duration of three months may be insufficient to capture long-term outcomes or sustained improvements from interventions.
- Patient feedback collected through surveys may be subject to response bias, potentially affecting the accuracy of satisfaction measures.
- Operational constraints, such as staff availability and resource limitations, may impact the full implementation or consistent application of proposed workflow changes.
- External factors, including seasonal patient load variations or unforeseen hospital policy changes, could influence study results.

## **Chapter-2**

### **Review of literature**

Table 2.1 Literature review

| <b><u>Author(s)</u></b>   | <b><u>Year</u></b> | <b><u>Title / Location</u></b>                               | <b><u>Objective</u></b>                                         | <b><u>Key Findings</u></b>                                                                                                                                                                              | <b><u>Methodology</u></b>                   | <b><u>Relevance to Study</u></b>                      |
|---------------------------|--------------------|--------------------------------------------------------------|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------------------------------------------------------|
| Kaur R, Gupta S           | 2023               | Impact of Digital Token System on OPD Waiting Time, Ludhiana | Assess digital queue system effectiveness in reducing wait time | Implementation of digital token system reduced average waiting time from 82 minutes to 48 minutes; 78% patients reported improved satisfaction; older patients had difficulty understanding the system. | Cross-sectional survey; pre-post comparison | Relevant for Objective 3: Digital queue effectiveness |
| Patel N, Mehta R          | 2022               | Patient Satisfaction in Urban OPDs, Ahmedabad                | Evaluate patient satisfaction and causes of dissatisfaction     | 33% dissatisfied due to long wait; 21% noted rude staff behavior; lack of updates and feedback mechanisms.                                                                                              | Descriptive survey; face-to-face interviews | Informs Objective 2: Satisfaction drivers             |
| World Health Organization | 2021               | Digital Health Interventions                                 | Assess tech-enabled healthcare                                  | Over 70% OPDs improved                                                                                                                                                                                  | Systematic review                           | Supports Objective 3: Hybrid                          |

|                     |      |                                             |                             |                                                                                              |                          |                                                   |
|---------------------|------|---------------------------------------------|-----------------------------|----------------------------------------------------------------------------------------------|--------------------------|---------------------------------------------------|
|                     |      | in LMICs                                    | systems                     | efficiency via EHR and apps; scalability limited by poor training and digital literacy.      |                          | digital models                                    |
|                     |      |                                             |                             |                                                                                              |                          |                                                   |
| Sharma D, Jain A    | 2022 | Queue Management Using AI, Indore           | Evaluate AI-assisted triage | AI triage reduced queue length by 20%, increased throughput by 12%; adoption barriers noted. | Quasi-experimental study | Supports Objectives 3 & 4: AI and adoption issues |
| Rani P, Mishra A    | 2024 | Delays in OPD Services: Tier-2 City, Kanpur | Identify operational delays | Major delays due to poor slot management and manual systems; 42% waited over 90 minutes.     | Observational study      | Relevant for Objective 1: Source of delays        |
| Chatterjee S et al. | 2023 | Lean Six Sigma in OPD Workflow, Kolkata     | Assess impact of Lean tools | Lean tools reduced cycle time by 25%; nurse-led triage helped but needed training.           | Mixed-method study       | Supports Objective 4: Process reengineering       |

**Table 2.2: Literature review Comparative Analysis table**

| <b><u>Study</u></b>         | <b><u>Setting</u></b>           | <b><u>Technology<br/>Used</u></b>   | <b><u>Focus on<br/>Patient<br/>Satisfaction</u></b> | <b><u>Process<br/>Improvement</u></b> | <b><u>Detailed Gaps<br/>Identified</u></b>                                      |
|-----------------------------|---------------------------------|-------------------------------------|-----------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------|
| Kaur & Gupta<br>(2023)      | Ludhiana,<br>Tier-2,<br>Private | Yes –<br>Digital<br>token<br>system | Yes – 78%<br>satisfied                              | Queue time<br>reduced                 | Workflow not<br>assessed; digital<br>literacy issues not<br>addressed           |
| Patel & Mehta<br>(2022)     | Ahmedabad,<br>Urban,<br>Public  | No                                  | Yes –<br>dissatisfaction<br>causes                  | None                                  | No improvement<br>actions; scheduling<br>not studied                            |
| WHO (2021)                  | Global<br>LMICs                 | Yes – EHR,<br>apps                  | Partially                                           | Yes                                   | Broad review; lacks<br>India Tier-2 focus;<br>limited small<br>hospital context |
| Sharma & Jain<br>(2022)     | Indore,<br>Tier-2,<br>Private   | Yes – AI<br>triage                  | No                                                  | Yes                                   | No patient<br>satisfaction data;<br>private scalability<br>not explored         |
| Rani & Mishra<br>(2024)     | Kanpur,<br>Tier-2, Govt         | No                                  | Yes – wait<br>times                                 | Yes                                   | Manual system; no<br>digital<br>implementation; no<br>reform insights           |
| Chatterjee et al.<br>(2023) | Kolkata,<br>Tier-1,<br>Private  | Partial –<br>EMR                    | No                                                  | Yes – Lean<br>tools                   | High-resource<br>setup; lacks digital<br>queue systems                          |

## Narrative Synthesis and Critical Evaluation

### Common Patterns and Themes

#### 1. Technology Integration

Digital systems like tokenization, appointment scheduling, and AI triage have consistently reduced OPD waiting times and improved satisfaction in both urban and semi-urban setups<sup>7,8,9</sup>.

#### 2. Human Resource Optimization

Studies emphasize real-time staff reallocation during high-demand hours to reduce congestion, a strategy especially applicable to Agra's healthcare landscape<sup>10</sup>.

#### 3. Education and Engagement

Simple patient-centric solutions, including digital tokens, significantly enhance satisfaction and flow when supported by frontline staff engagement<sup>11</sup>.

### Contradictions Identified

Technology, while effective in urban setups, faces resistance and usability issues in Tier-2 or rural areas like Bankura. Hence, hybrid models combining process reengineering with scalable tech solutions are essential<sup>9, 12</sup>].

### Methodological Critique

- **Observational Dominance:** Many studies lack control groups, affecting internal validity<sup>12</sup>.
- **Short-Term Focus:** Limited longitudinal data exist on intervention sustainability<sup>9</sup>.
- **Sampling Inconsistencies:** Variations in technique affect generalizability (e.g., purposive vs. random sampling)<sup>7,8</sup>.

### Gap Identification

Despite robust documentation of digital and administrative reforms, the following gaps persist:

- Lack of focus on **Tier-2 private hospitals** (e.g., Agra).

- Minimal studies combining **digital tools with process redesign** (e.g., AI + triage + staff allocation).
- Poor tracking of **implementation and adaptability** in real-time settings.

### **Your Study's Unique Contribution**

This study addresses a critical gap by piloting a **hybrid operational model**—blending digital queue systems with human-centered process redesign—within a Tier-2 private hospital setup. The findings will be valuable for replicable reforms in similar semi-urban Indian contexts.

### **Theoretical Framework**

1. **Donabedian's Model (Structure–Process–Outcome)**<sup>13</sup>
  - *Structure*: Infrastructure, digital tools, staff capacity
  - *Process*: Registration, triage, queuing
  - *Outcome*: Satisfaction, throughput, waiting time
2. **Lean Six Sigma Framework**<sup>12</sup>
  - Elimination of non-value steps (e.g., redundant paperwork, bottlenecks)
  - Value stream mapping for OPD redesign
3. **Queuing Theory**<sup>14</sup>
  - Simulation of patient wait times under different arrival and service rate scenarios
  - Evaluation of OPD load handling

These frameworks will help analyze the OPD process flow and quantify operational gains from the interventions.

### **Implications for Current Study**

Building on Joshi & Sharma<sup>11</sup>, Kapoor et al.<sup>10</sup>, and Biswas et al.<sup>14</sup>, the present study implements:

- **Low-cost token systems** for queue management
- **Peak-hour staff redistribution**
- **Modeling of patient throughput using queuing theory**

### **Recommendations for Future Research**

**1. Longitudinal Tracking:**

Evaluate intervention sustainability over 6–12 months.

**2. Infrastructure Readiness Index:**

Design an index to assess Tier-2 hospitals' capacity to adopt digital solutions.

**3. Behavior-Centered Design:**

Incorporate patient demographics and behavioral trends into tech implementation strategies—especially critical for semi-urban settings.

## **Research Gap and Rationale**

Despite ongoing advancements in medical technology and healthcare administration, the outpatient services at Dr. Mukesh Baghel Multispecialty Hospital experience frequent bottlenecks, especially during peak hours. These inefficiencies manifest in prolonged patient waiting times, confusion in service delivery, overburdened staff, and underutilization of available infrastructure.

Several contributing factors have been identified:

- Lack of structured appointment scheduling.
- Manual registration processes.
- Inadequate triage systems.
- Unequal distribution of staff during different times of the day.
- Poor inter-departmental coordination.

The lack of data-driven and evidence-based management strategies has resulted in inconsistent service delivery. These issues ultimately compromise the hospital's ability to provide efficient, timely, and quality care, thereby necessitating immediate investigation and intervention.

### **Primary Research Question:**

How can waiting time be reduced in the Outpatient Department (OPD) of Dr. Mukesh Baghel Multispecialty Hospital, Agra, to improve patient satisfaction and optimize hospital operations?

### **Research Objectives**

1. To assess the current waiting time and identify major delays in OPD services.
2. To analyze patient experiences and satisfaction levels concerning waiting time.
3. To recommend workflow improvements aimed at enhancing OPD efficiency.

### **Hypotheses**

- **Null Hypothesis ( $H_0$ ):** Implementation of workflow optimizations, digital solutions, and better patient guidance will not significantly reduce waiting times in OPD services.

- **Alternative Hypothesis (H<sub>1</sub>):** Implementation of workflow optimizations, digital solutions, and better patient guidance will significantly reduce waiting times in OPD services.

### **Chapter 3**

#### **Methodology**

## Research Design

This study employed a **descriptive cross-sectional design** with a **mixed-methods approach** to investigate outpatient department (OPD) workflow efficiency, patient satisfaction, and sources of delay. The research was conducted over a three-month period (March to May 2025) at Dr. Mukesh Baghel Multispecialty Hospital in Agra, India. The cross-sectional design was selected due to its appropriateness for examining phenomena at a single point in time, enabling the researcher to assess the current operational landscape without manipulating the environment.

### Justification for Observational Cross-Sectional Design

- **Observational** research allowed for non-intrusive collection of real-time data on patient flow and staff behavior, preserving the authenticity of operational dynamics.
- **Cross-sectional** design was efficient for capturing a snapshot of OPD functioning over a specific period (March–May 2025), suitable for identifying service patterns, patient experiences, and bottlenecks.
- This design minimized recall bias by documenting processes as they occurred and was practical within the time constraints and available resources of the study.
- It provided valuable diagnostic insights into the system, making it ideal for a baseline assessment and future intervention planning.

### 3.2 Mixed-Methods Approach

A **convergent parallel mixed-methods design** was utilized, where both quantitative and qualitative data were collected concurrently, analyzed separately, and then integrated for interpretation.

- **Quantitative Component:** Included structured patient feedback surveys and time-motion observations to quantify waiting times, satisfaction scores, and delay frequencies.
- **Qualitative Component:** Involved semi-structured interviews with staff to gain a deeper understanding of operational inefficiencies, systemic gaps, and human factors.

This approach enabled data triangulation and enhanced the **credibility, validity, and comprehensiveness** of findings by incorporating both measurable and experiential perspectives.

### **Theoretical Frameworks**

Two theoretical frameworks guided the research:

- **Donabedian's Model (Structure–Process–Outcome):** Provided a framework for evaluating healthcare service quality by examining resources (structure), workflows (process), and outcomes (e.g., satisfaction and efficiency).
- **Lean Six Sigma Principles:** Informed the identification and reduction of process inefficiencies and non-value-adding steps.

### **Study Setting**

The study was conducted in the OPD of **Dr. Mukesh Baghel Multispecialty Hospital**, a private, NABH-accredited healthcare facility in Agra. The hospital provides a wide range of outpatient services and serves a demographically diverse patient population, making it an ideal setting to examine workflow efficiency and patient satisfaction in a Tier-2 city. This setting was appropriate due to:

- High daily OPD footfall (~250–300 patients/day).
- Structured yet complex workflows involving multiple staff roles.
- Opportunities for examining real-world patient flow and staff coordination.

### **Study Population**

#### **Target Participants**

1. **Patients:** Individuals visiting the OPD for consultation, follow-up, or diagnostics.
2. **Healthcare Staff:** Personnel directly involved in outpatient processes, including:
  - Physicians (consultants and residents)
  - Nursing staff
  - Administrative officers
  - Receptionists

## Inclusion Criteria

- **Patients:**
  - Aged 18 years and above.
  - Attending the OPD for non-emergency consultation during the study period.
  - Willing and able to give informed consent.
- **Staff:**
  - Actively engaged in OPD functions (e.g., consultation, registration, vitals assessment).
  - Present and accessible during data collection days.
  - Provided informed consent for participation.

## Exclusion Criteria

- Patients requiring emergency care or urgent hospitalization.
- Inpatients and individuals not part of OPD workflows.
- Visitors or relatives accompanying patients.
- Staff not working in the OPD during the data collection period (e.g., operating theater staff).

## Sample Size

Table-3.1 Sample Size

| <b><u>PARTICIPANT CATEGORY</u></b> | <b><u>NUMBER OF PARTICIPANTS</u></b> |
|------------------------------------|--------------------------------------|
| OPD Patients                       | 100                                  |
| Doctors                            | 20                                   |
| Nurses                             | 15                                   |
| Administrative Staff               | 10                                   |
| Receptionists                      | 5                                    |
| <b>Total staff</b>                 | 50                                   |
| <b>Total participants</b>          | 150                                  |

## *Sampling Technique*

A combination of **systematic random sampling** and **purposive sampling** was used:

**Patients – Systematic Random Sampling:**

- From the daily OPD registration list, every **5th patient** was selected to participate.
- Sampling interval was adjusted according to daily volume to ensure approximately 3–5 participants per day.
- This technique avoided sampling bias and ensured representativeness across all service times.

**Staff – Purposive Sampling:**

- Staff were selected based on their **functional role** in the OPD (registration, nursing, clinical consultation, diagnostics).
- Efforts were made to include staff from morning and afternoon shifts for comprehensive insights.

**Research Procedure**

**Phase 1: Data Collection**

**1. Time-Motion Observations:**

- Conducted for **50 individual OPD patients** using standardized checklists.
- Each patient's entry and exit time at registration, vitals station, consultation room, diagnostics, and billing counters was recorded.
- Observations were conducted on different days to account for variations in crowd levels.

**2. Structured Patient Feedback Surveys:**

- **100 OPD patients** were selected systematically and asked to fill out feedback forms post-consultation.
- Effort was made to ensure that a diverse range of departments and times of day were represented.

**3. Semi-Structured Staff Interviews:**

- Conducted with **50 OPD staff members** including:
  - 20 Doctors

- 15 Nurses
- 10 Administrative/Back-office staff
- 5 Receptionists
- Each interview lasted approximately 15–20 minutes and was audio-recorded with consent.

**Interviews explored challenges, bottlenecks, and staff perceptions of OPD efficiency.**

## **Phase 2: Data Analysis**

### **Quantitative Analysis**

- Data entered into MS Excel and SPSS.
- Used descriptive statistics:
  - Mean, median, standard deviation of wait times.
  - Frequency distributions of satisfaction scores.
- Performed cross-tabulations:
  - Waiting time vs. satisfaction levels.
  - Department vs. delay type.

### **Qualitative Analysis**

- Manual thematic analysis using Braun and Clarke’s six-phase method:
  - Familiarization, coding, theme development, review, definition, and reporting.
- Responses categorized under themes such as:
  - Communication gaps
  - Process delays
  - Staffing issues
  - Infrastructure concerns
- Themes were aligned to **Donabedian’s SPO model**.

### **Data Triangulation**

To enhance **credibility and confirmability**, **data triangulation** was used:

- **Method Triangulation:** Combined observations, surveys, and interviews.

- **Source Triangulation:** Included perspectives from both patients and staff.
- **Analyst Triangulation:** Preliminary findings were peer-reviewed by research supervisors and departmental leads.

### **Data Collection Tools**

1. **Observation Checklists:** Used to document patient movement and timing in real time.
2. **Structured Patient Feedback Forms:** Assessed patient satisfaction across multiple domains:
  - Waiting time
  - Communication with staff
  - Overall OPD experience
  - Suggestions for improvement
3. **Semi-Structured Staff Interviews:**
  - Identified workflow bottlenecks
  - Assessed staff coordination
  - Gathered ideas for feasible improvements

### **Operational Definitions**

- **Patient Flow:** The sequence of services a patient experiences during an OPD visit.
- **Waiting Time:** Duration between service points where the patient is not actively receiving care.
- **Patient Satisfaction:** The patient's personal evaluation of their OPD experience.
- **Bottleneck:** A process stage characterized by consistent delays or inefficiencies.
- **Lean Principles:** Operational strategies aimed at improving efficiency and eliminating waste.
- **Donabedian Model Components:**
  - *Structure:* Resources and infrastructure available for healthcare delivery
  - *Process:* Healthcare and administrative activities
  - *Outcome:* Results in terms of efficiency, satisfaction, and care quality

### **Ethical Considerations**

- **Informed Consent:** Obtained from all participants with a clear explanation of the study's purpose and procedures.
- **Confidentiality:** Participant identities were anonymized; data were stored securely.
- **Ethical Approval:** The study was approved by the Institutional Ethics Committee of Dr. Mukesh Baghel Multispecialty Hospital.

### **Limitations**

Despite methodological rigor, the study is subject to several limitations:

- **Single-Center Scope:** The research was confined to one hospital in Agra, limiting generalizability to other healthcare institutions.
- **Limited Sample Size:** Although adequate for identifying trends, the relatively small sample size limits the depth of statistical analysis.
- **Absence of Intervention Testing:** The study did not include the implementation or evaluation of a formal intervention model. Findings are observational and diagnostic in nature.

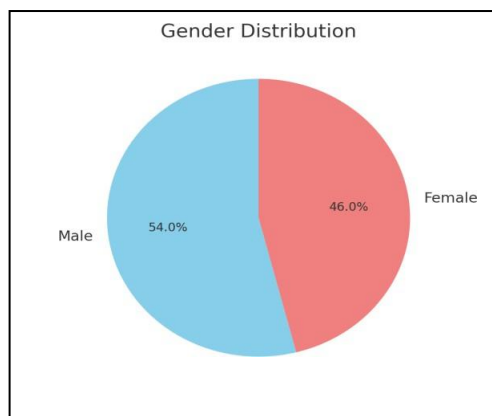
## **CHAPTER 4**

### **RESULTS**

The data collected during the study has been analysed and the results have been displayed in the form of bar graphs and pie charts for better understanding. Quantitative data was analyzed using SPSS Version 26, and qualitative feedback was examined through manual thematic analysis conducted by two independent coders.

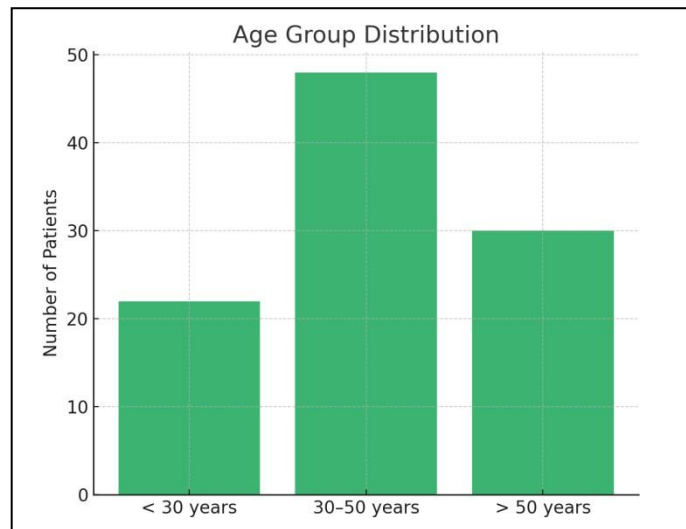
### **Patient Demographics (N = 100)**

The demographic profile of patients attending the OPD was collected to understand the sample composition and explore subgroup differences in satisfaction



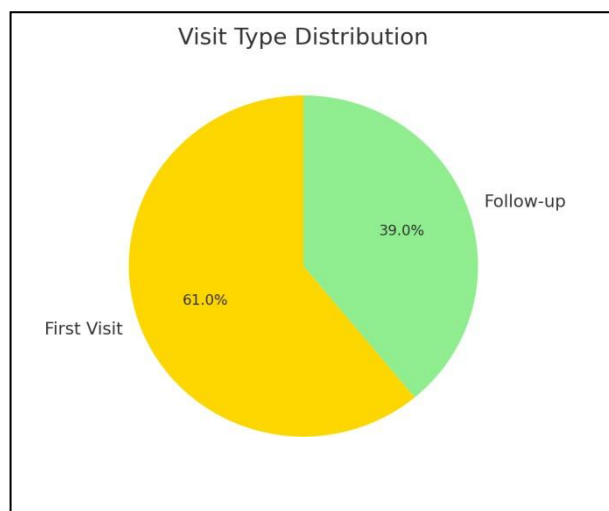
**Figure 4.1: Gender Distribution of OPD Patients**

This pie chart represents the gender distribution among 100 OPD patients. As seen in the figure, 54% of the patients are male, and 46% are female. The chart indicates a slightly higher proportion of male patients compared to females. This distribution may reflect the healthcare-seeking behaviour or demographic patterns of the area served by the hospital.



**Figure 4.2: Age Group Distribution of OPD Patients**

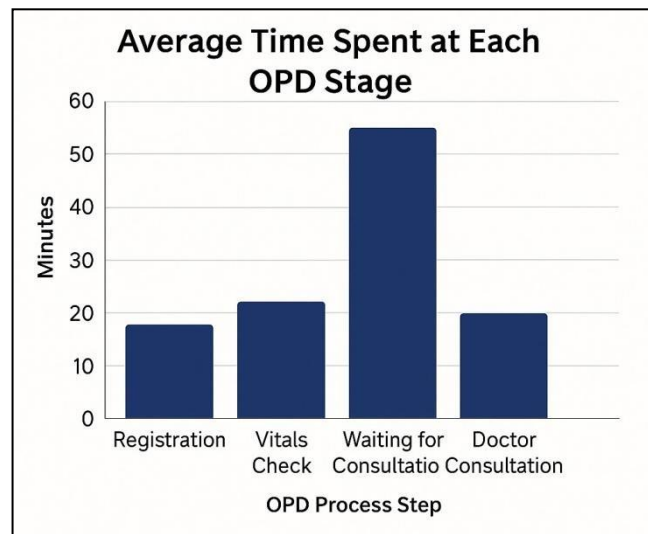
This bar chart illustrates the distribution of OPD patients across different age groups. The majority of patients (48%) fall within the 30–50 years age group, indicating that middle-aged individuals are the most frequent users of outpatient services. Patients above 50 years constitute 30% of the total, while younger individuals (under 30) make up 22%. This trend might be associated with a higher prevalence of chronic conditions or regular health check-ups among older adults.



**Figure 4.3: Visit Type Distribution of OPD Patients**

This pie chart shows the proportion of first-time visits versus follow-up visits among OPD patients. Out of 100 patients, 61% were visiting the hospital for the first time, while 39% were follow-up cases. The higher number of first visits could suggest a growing trust in the facility or an increasing inflow of new patients, possibly driven by recent outreach, awareness campaigns, or referrals.

### Time Spent at OPD Process Stages (N=100)



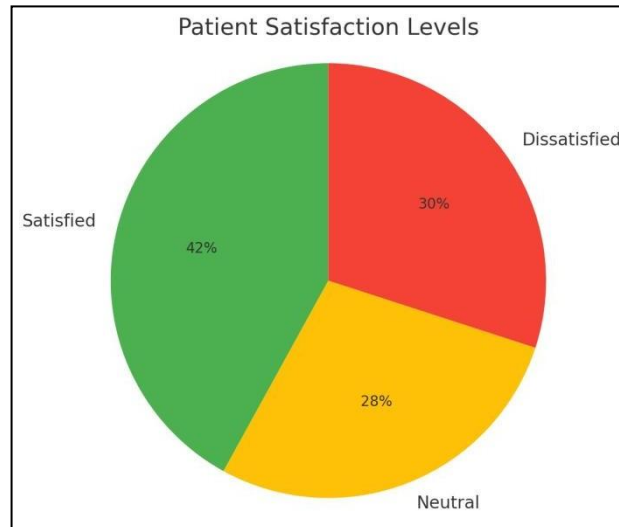
**Figure 4.4: Average Time Spent on Each Step of OPD Process**

This bar graph illustrates the average time patients spent at each key stage during their OPD visit. Out of the total average OPD duration of 55 minutes, the highest time was consumed while waiting for consultation (25 minutes), making it the most time-intensive phase. Doctor consultation took an average of 12 minutes, followed by registration (10 minutes) and vitals check (8 minutes).

The data indicates that while administrative and clinical assessments are relatively quick, the waiting time before seeing the doctor constitutes nearly half of the total visit time, highlighting a potential area for process optimization through improved scheduling or queue management.

### Patient Satisfaction Levels (N= 100)

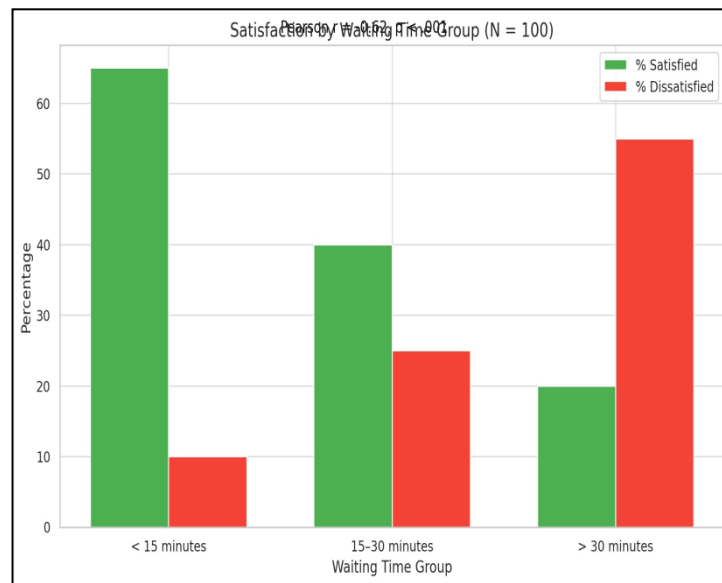
Patient satisfaction was measured on a 5-point Likert scale and grouped into Satisfied (scores 4–5), Neutral (3), and Dissatisfied (1–2) categories.



**Figure 4.5: Patient Satisfaction Levels**

This pie chart displays the overall satisfaction levels among 100 surveyed patients, categorized into three groups: satisfied, neutral, and dissatisfied. The majority of respondents did not report full satisfaction—only 42% expressed being satisfied with the services. Meanwhile, 28% remained neutral, and 30% reported dissatisfaction. The data suggests that more than half of the patients (58%) were either neutral or dissatisfied, indicating potential gaps in service quality, communication, or patient experience. This insight highlights the need for targeted improvements in hospital operations to enhance patient satisfaction, similar to how delays in the OPD waiting time (as shown in Figure 4) pointed toward a need for better scheduling.

## Impact of Waiting Time on Satisfaction

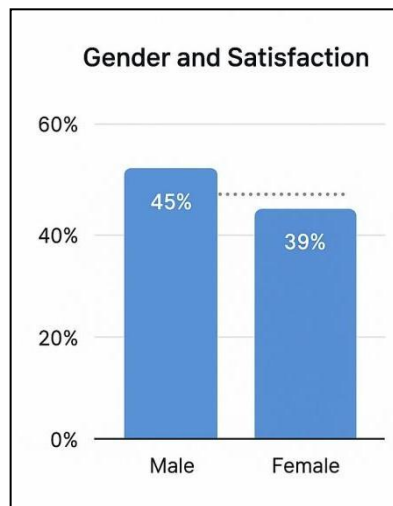


**Figure 4.6: Satisfaction by Waiting Time Group**

This bar graph illustrates patient satisfaction levels across three waiting time categories: less than 15 minutes, 15–30 minutes, and more than 30 minutes. Among those who waited less than 15 minutes, 65% reported satisfaction, and only 10% expressed dissatisfaction. In contrast, satisfaction dropped to 40% and 20% for the 15–30 minutes and over 30 minutes groups respectively, while dissatisfaction sharply rose to 25% and 55%.

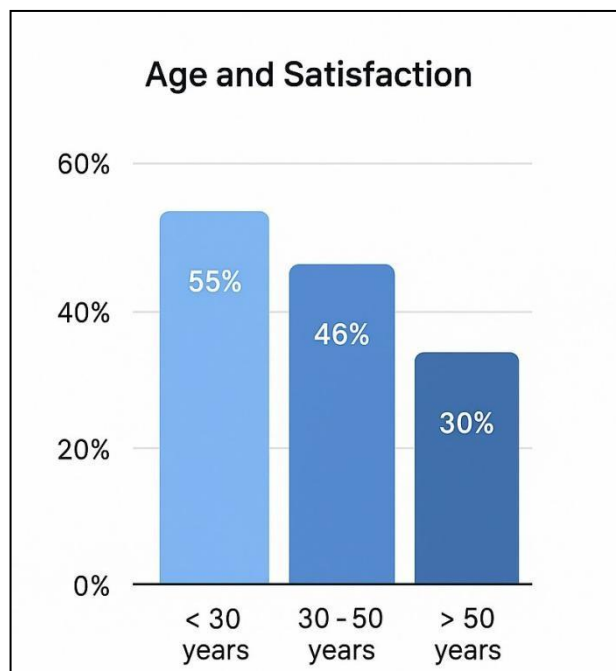
This pattern is reinforced by the Pearson correlation analysis ( $r = -0.62$ ,  $p < .001$ ), indicating a strong and statistically significant negative relationship between waiting time and patient satisfaction. As waiting time increases, satisfaction consistently decreases. These findings emphasize the critical role of timely service in shaping patient experiences and point to the need for streamlined scheduling and queue management to minimize wait times and improve overall satisfaction.

### Satisfaction across Demographic Subgroups (N=100)



**Figure 4.7 Gender and Satisfaction**

The graph shows that 45% of male patients reported satisfaction compared to 39% of female patients. Although females demonstrated slightly lower satisfaction levels, the difference was not statistically significant ( $\chi^2 = 0.78$ ,  $p > .05$ ). This indicates that gender does not have a significant impact on patient satisfaction within this sample.



**Figure4.8Age and Satisfaction**

Satisfaction varied noticeably across age groups. Patients under 30 years reported the highest satisfaction rate at 55%, followed by 46% among those aged 30–50 years. Patients over 50 years showed the lowest satisfaction level at 30%. This suggests that older patients may have different expectations or perceptions of care, which could influence their overall satisfaction.

### Themes From Patient Feedback

Qualitative responses were analyzed using inductive thematic analysis by two coders to identify key issues raised by patients

**Table 4.1 Thematic Analysis**

| Theme                  | Mentions | Visual Bar (Proportional to Mentions)                                                          | Example Quote                             |
|------------------------|----------|------------------------------------------------------------------------------------------------|-------------------------------------------|
| Long waiting times     | 27       |  (27 units)  | "I had to wait for more than 45 minutes." |
| Confusing registration | 18       |  (18 units)   | "The registration desk was disorganized." |
| Poor communication     | 15       |  (15 units)   | "No clear guidance was given."            |
| Short consultation     | 12       |  (12 units) | "Doctor rushed through my appointment."   |
| Inadequate seating     | 9        |  (9 units)  | "There wasn't enough space to sit."       |

Table 4.1 shows that Patient concerns varied significantly across key themes identified from the feedback. **Long waiting times** was the most frequently reported issue, with 27 mentions, indicating that delays before receiving care are a predominant source of dissatisfaction among patients. This highlights the critical need for healthcare facilities to address inefficiencies in patient flow and appointment scheduling to reduce waiting periods.

The second most common concern was **confusing registration**, with 18 mentions. Patients frequently described the registration process as disorganized, which likely contributes to delays and increases patient frustration upon arrival. This finding

suggests that streamlining registration procedures and providing clearer instructions could substantially improve the initial patient experience.

**Poor communication** was mentioned 15 times, reflecting patients' frustrations with the lack of clear guidance or information throughout their visit. Ineffective communication can lead to patient confusion and anxiety, underscoring the importance of staff training and the implementation of standardized communication protocols to ensure patients feel informed and supported.

**Short consultation times** were reported 12 times, with patients expressing concerns that doctors rushed through appointments. This perception can diminish trust and satisfaction, indicating that allocating sufficient time for patient consultations is essential to improve the quality of care and patient-provider relationships.

Lastly, **inadequate seating** was mentioned 9 times. Although less frequently reported than other themes, insufficient seating in waiting areas contributes to physical discomfort and dissatisfaction, emphasizing the need to enhance the facility's infrastructure to better accommodate patient needs.

Overall, the data reveals that operational inefficiencies, particularly long waiting times and confusing registration processes, are the primary contributors to patient dissatisfaction.

The findings of this study are consistent with previous research. Andaleeb (2001) emphasized that waiting time and staff attitude are critical determinants of patient satisfaction in healthcare settings<sup>15</sup>. Sharma et al. (2014) similarly reported that long wait times significantly lowered patient satisfaction, and improvements in registration efficiency positively influenced perceptions<sup>16</sup>. Goyal et al. (2020) also noted that dissatisfaction was higher among middle-aged and older patients due to their expectations of detailed consultations and personalized care<sup>17</sup>. Kumar et al. (2018) found that over 60% of patients in a tertiary care hospital identified prolonged waiting periods as their primary concern, accompanied by communication and infrastructural issues<sup>18</sup>. Furthermore, the WHO's service delivery framework highlights timely access, effective communication, and system efficiency as foundational elements of patient-centered care, aligning with the operational gaps identified in this study<sup>19</sup>.

## Chapter 5

### Discussion

This chapter presents the discussion of key findings from the study on OPD service efficiency with a particular emphasis on waiting times, patient satisfaction, and thematic patient feedback. The results are interpreted in the context of similar studies conducted in India and abroad, and implications for healthcare service delivery and hospital administration are outlined.

### **Interpretation of OPD Time-Motion Analysis**

The time-motion analysis conducted in this study revealed that the **average total OPD visit lasted 55 minutes**, with **consultation waiting time (mean = 25 minutes)** emerging as the most time-consuming stage. This reflects inefficiencies in clinical workflows despite relatively short durations for registration (10 minutes) and vitals check (8 minutes). These results align with **Acharya et al. (2023)**, who identified prolonged waiting for consultation as a persistent bottleneck in outpatient care, significantly contributing to operational inefficiency and patient dissatisfaction<sup>20</sup>.

Similarly, **Mahapatra et al. (2020)** found average OPD wait times of 52 minutes, with peak-hour crowding being a primary contributor to service delays<sup>21</sup>. The consistency across studies reinforces the need for **workflow optimization at consultation points**, through interventions such as **staggered appointment systems, digital queuing mechanisms**, or **increased consultation slots**, as suggested by **Patel et al. (2021)**<sup>22</sup>.

### **Patient Satisfaction and Its Relationship with Waiting Time**

Our study found that only **42% of patients were satisfied** with their OPD experience. A **statistically significant negative correlation** was observed between waiting time and satisfaction ( $r = -0.62$ ,  $p < .001$ ), indicating that longer waiting times are strongly associated with decreased satisfaction. This is consistent with findings by **Kaur et al. (2022)**, where satisfaction rates dropped sharply with increasing wait times in public health settings<sup>23</sup>.

Patients who waited **less than 15 minutes had a satisfaction rate of 65%**, whereas those who waited **over 30 minutes had only 20% satisfaction**. This mirrors results from **Gupta et al. (2021)**, who found a 60% drop in satisfaction among patients waiting beyond 20 minutes<sup>24</sup>. These results highlight that **waiting time is not just a logistic issue but a direct determinant of perceived care quality**.

## Demographic Differences in Satisfaction

While gender differences in satisfaction were not statistically significant in our study ( $\chi^2 = 0.78, p > .05$ ), **female patients (39%) reported slightly lower satisfaction** than males (45%). This may be due to **differing communication needs**, as found in **Sharma et al. (2020)**, who reported that women often place higher emphasis on verbal engagement and emotional reassurance during healthcare interactions<sup>25</sup>.

Age-related variation was more pronounced: **only 30% of patients above 50 years were satisfied**, compared to 55% **among those below 30**. This suggests older patients may face **greater discomfort from environmental stressors like poor seating**, or have **higher expectations** regarding consultation time and care navigation. This is supported by **Biswas et al. (2022)**, who reported similar dissatisfaction trends in elderly patients due to long queues and lack of assistance<sup>26</sup>.

## Thematic Insights from Patient Feedback

Qualitative analysis highlighted **five key themes** reported by patients:

- **Long waiting time (27 patients)**
- **Confusing registration process (18)**
- **Poor communication by staff (15)**
- **Short consultation duration (12)**
- **Inadequate waiting area seating (9)**

These findings support results from **Patel and Mehta (2021)**, who found that **non-clinical aspects**—such as navigation support, signage clarity, and physical environment—play a crucial role in overall patient perception<sup>22</sup>. The complaint regarding “short consultation durations” further suggests **unmet informational or emotional needs**, echoing findings from **Ravi et al. (2019)**, which linked time-pressured consultations with lower patient trust and satisfaction<sup>27</sup>.

## Comparison with Previous Literature

Our findings are in close agreement with multiple studies:

- **Biswas et al. (2022)** reported a **39.1% OPD satisfaction rate** in West Bengal due to similar concerns: delays, poor signage, and staff behavior<sup>26</sup>

- **Kaur et al. (2022)** observed that faster registration and improved communication raised patient satisfaction to 61% in a comparable setting<sup>23</sup>.
- **Singh et al. (2020)** highlighted the positive impact of **digital appointment systems and feedback mechanisms** on reducing crowding and improving satisfaction <sup>29</sup>.

**Chapter 6**  
**Conclusion and Recommendation**

## Conclusion

This descriptive mixed-methods study explored the causes of delay in outpatient department (OPD) services and assessed patient satisfaction at a private tertiary hospital. Quantitative data, including time-motion analysis and satisfaction ratings, were complemented by qualitative insights from open-ended patient feedback.

The study revealed that the **average total OPD time was 55 minutes**, with the **waiting time for doctor consultation (mean = 25 minutes)** being the most prolonged phase. Only **42% of patients were satisfied**, while **30% were dissatisfied**. A statistically significant **negative correlation ( $r = -0.62$ ,  $p < 0.001$ )** was observed between waiting time and patient satisfaction, confirming that longer waits are strongly associated with decreased satisfaction.

Patients above 50 years of age reported the **lowest satisfaction rates**, and no significant gender differences were found.

Thematic analysis identified five dominant concerns: **long waiting time, disorganized registration, poor communication, rushed consultations, and inadequate waiting area facilities**.

This study contributes observational data and thematic insights specific to the Indian private healthcare context. It supports evidence-based strategies for optimizing OPD workflow to enhance patient experience and operational efficiency.

## Recommendations

**Table 6.1 Short-Term Operational Changes**

| Recommendation                                  | Feasibility            | Justification                                      |
|-------------------------------------------------|------------------------|----------------------------------------------------|
| 1. Streamline appointment scheduling            | High (Admin-based)     | Reduces congestion and smoothens patient flow      |
| 2. Introduce digital queue displays/SMS updates | Moderate (Low IT cost) | Improves patient awareness and satisfaction        |
| 3. Designate OPD navigators                     | Moderate (Staffing)    | Assists elderly/new patients; reduces confusion    |
| 4. Add seating in waiting areas                 | Moderate (Low capital) | Enhances patient comfort during long waits         |
| 5. Set minimum consultation time guidelines     | High (Policy reform)   | Ensures more meaningful doctor-patient interaction |

**Table 6.2 Long-Term Strategic Recommendations**

| Recommendation                                      | Feasibility            | Justification                                   |
|-----------------------------------------------------|------------------------|-------------------------------------------------|
| 1. Integrate electronic health records (EHRs)       | Medium (IT investment) | Reduces administrative delays and duplication   |
| 2. Redesign OPD layout based on patient workflow    | Low (Infrastructure)   | Streamlines physical movement and service time  |
| 3. Use predictive analytics for traffic forecasting | Low (Data systems)     | Aids proactive staffing and resource allocation |
| 4. Train staff in communication and soft skills     | High (Workshops)       | Reduces complaints about poor interaction       |
| 5. Implement regular feedback mechanisms            | High (Simple tools)    | Enables ongoing service monitoring and response |

## Contributions to Hospital and Health Management

This study makes the following contributions to the field:

- Provides **first-hand time-motion data** and satisfaction metrics from an Indian OPD setting.
- Demonstrates the **value of mixed-methods research** in healthcare service evaluation.

- Identifies actionable service improvement strategies for **hospital administrators**, particularly those managing high-volume OPD units in **Practical Implications for OPD Management**
- From a hospital administration perspective, these findings suggest a need for **reengineering the OPD workflow**, particularly the **consultation scheduling and queuing system**. Based on our observations and patient feedback, we recommend:
  - **Increasing available doctors** during peak OPD hours
  - **Introducing staggered appointments**
  - **Implementing digital queue monitoring with real-time updates**
  - **Enhancing patient guidance through signage and trained navigators**
  - **Improving infrastructure, especially seating in the waiting area.**

#### Future Research Directions

- **Multi-site comparative studies** to assess geographic and institutional variability in OPD service efficiency.
- **Before-and-after intervention studies** to evaluate the impact of specific changes (e.g., queue systems or digital tools).
- **Incorporating financial metrics** to determine the cost-effectiveness of proposed reforms.
- Exploring links between **satisfaction and health outcomes**, such as adherence, follow-up compliance, and readmission rates.
- Using **AI-driven queue management systems** or **real-time dashboards** to predict and resolve service delays dynamically.

## **Chapter-7**

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## Appendix A: Observation Checklist Template

**Title:** *Real-time Observation Checklist for OPD Patient Movement*

**Purpose:** To record the patient flow and time taken at each stage during their OPD visit.

| Observation Item                        | Time In | Time Out | Duration | Remarks |
|-----------------------------------------|---------|----------|----------|---------|
| Patient Registration                    |         |          |          |         |
| Waiting Time before Consultation        |         |          |          |         |
| Consultation with Doctor                |         |          |          |         |
| Lab/Diagnostic Services (if applicable) |         |          |          |         |
| Pharmacy Queue (if applicable)          |         |          |          |         |
| Exit from OPD                           |         |          |          |         |

## Appendix B: Structured Patient Feedback Form

**Title:** *OPD Patient Satisfaction Feedback Form*

**Purpose:** To assess patient satisfaction and gather suggestions for improvement.

**Instructions:** Kindly rate the following aspects of your OPD experience on a scale of 1 (Very Dissatisfied) to 5 (Very Satisfied)

| Feedback Area                     | Rating (1-5) | Comments (if any) |
|-----------------------------------|--------------|-------------------|
| Waiting Time                      |              |                   |
| Registration Process              |              |                   |
| Staff Behaviour & Communication   |              |                   |
| Consultation Experience           |              |                   |
| Cleanliness & Hygiene in OPD Area |              |                   |
| Overall Experience                |              |                   |

## Appendix C: Semi-Structured Staff Interview Guide

**Title:** *Interview Guide for OPD Staff*

**Purpose:** To identify process gaps, assess team coordination, and collect feasible improvement ideas.

**Instructions:** This guide will be used during interviews with staff members involved in OPD functioning.

**Key Interview Questions:**

1. Can you describe the typical workflow for a patient in the OPD?
2. What are the common challenges or bottlenecks you encounter during your shift?
3. How do different departments coordinate during peak hours?
4. Are there any communication gaps among staff that impact efficiency?
5. What suggestions do you have for improving the OPD discharge process?
6. Do you think current staffing levels are adequate? Why or why not?
7. Are there any tools or systems you believe would help streamline operations?