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A Time Motion Study of Selected Hospital Services in a Tertiary Care Hospital in Navi Mumbai

Vaishnavi Yadav
Masters in Hospital Administration
MGM institute of health sciences

Abstract

In healthcare settings, patient satisfaction is heavily influenced by waiting times and the efficiency of service delivery. Long wait times can significantly impact patient satisfaction and overall perception of healthcare quality. This study aims to evaluate the waiting times at various stages of patient interaction in outpatient departments (OPDs) of a tertiary care hospital in Navi Mumbai. By conducting a time-motion study, the research seeks to identify key areas where delays occur and suggest improvements to enhance the patient experience. With a focus on registration and consultation processes in the Surgery, Medicine, and Orthopaedic OPDs, the study provides actionable insights into how hospital services can be optimized to reduce waiting times and improve patient satisfaction. Understanding these dynamics is crucial for developing effective strategies to streamline hospital operations and meet patient expectations.

Keywords - Waiting Time, Patient Satisfaction, Outpatient Departments (OPDs), Time-Motion Study, Hospital Services, Queue Management, Registration, Consultation Efficiency.

Introduction

Hospitals are essential for delivering a range of healthcare services, from routine check-ups to complex surgeries, and are vital for community health. In Navi Mumbai, Mahatma Gandhi Mission (MGM) Medical College, a 900-bedded tertiary hospital, plays a key role in meeting the region's healthcare needs. The hospital offers comprehensive services, including emergency care, specialized outpatient clinics, advanced diagnostic and therapeutic procedures, and has a dedicated team of professionals.

The Outpatient Department (OPD) is crucial for providing medical consultations and treatments on the same day, but complex registration procedures and high patient volumes can challenge efficiency and care quality. Long waiting times in OPDs negatively impact patient satisfaction and perceptions of the hospital.

This study uses a Time-Motion Study (TMS) approach to evaluate patient waiting time at the Registration department and selected OPDs (General Medicine, Orthopaedics, General Surgery) at MGM Hospital, Kamothe, Navi Mumbai. The goal is to identify areas for improving efficiency and patient satisfaction, streamline operations, and enhance the overall patient experience.

Review of Literature

Efficient healthcare service delivery is essential for ensuring patient well-being, with a key focus on reducing waiting times in outpatient departments (OPD) of tertiary care hospitals. This review synthesizes research on time-motion studies related to waiting times in registration and OPD processes and their impact on patient satisfaction.

Time-motion studies are a systematic approach to observing and analysing the time spent on various tasks within a process. Originating from Frederick Winslow Taylor's work on scientific management principles in the late 19th century, these studies have evolved to enhance efficiency across diverse fields, including healthcare [3].

In healthcare settings, time-motion studies are crucial for improving patient care processes, optimizing resource allocation, and enhancing workflow efficiency. By examining the time taken for Registration and OPD processes, these studies help identify inefficiencies, streamline workflows, and improve patient experiences, leading to cost savings and better healthcare delivery.

Several studies have investigated waiting times and their effects:

A study in Ethiopia found that patients at Jimma University Specialized Hospital waited an average of 4.5 hours for medical attention [1].

Research by Aqeel Albraheem et al. showed that increasing the number of triage nurses and doctors in emergency departments reduced waiting times for various patient categories and improved the quality of service, leading to a decrease in patients leaving without being seen [2]. Dr. Sandesh Kumar Sharma and Dr. Sudhinder Singh Chowhan's study assessed OPD waiting times and identified factors contributing to delays, offering recommendations to improve efficiency [4].

Vaishali K and Dr. Soundara Rajan's research highlighted patient dissatisfaction due to delays in the billing department and suggested increasing staff levels in the laboratory and radiology departments to alleviate these issues [5]. Pankaj Kumar Mandal's study revealed significant waiting times outside the OPD and recommended modernizing methods to reduce congestion [6]. Farah Naaz and Idris Mohammad reported that patients spent an average of 2 hours in the OPD, with consultation times being a major contributor to delays [7]. Ram Iswar Shah et al. emphasized the importance of time-motion studies in identifying bottlenecks and improving process efficiency in the OPD, aligning with Lean Six Sigma methodologies [8].

Research by Shalya tantra et al. noted average registration and OPD waiting times, with varying patient satisfaction levels and suggestions for process improvements [9].

Dwi Pidjaningsih et al. analysed service durations and waiting times in outpatient pharmacies, identifying delays and recommending increased staffing [10].

H N Nagesha et al. investigated delays in billing processes and suggested expanding the workforce and improving process understanding to expedite billing [11].

These studies collectively underscore the need for targeted interventions to address inefficiencies in hospital operations. Implementing technology solutions, reallocating resources, enhancing staff training, and improving patient communication are crucial strategies for optimizing OPD operations and enhancing patient satisfaction.

Aim

To conduct a time-motion study of selected hospital services in a tertiary care hospital in Navi Mumbai.

Objectives

1. To study the causes of delay and suggest measures to reduce the waiting time of patients in the hospital.

2. To assess patient satisfaction with the hospital services (Registration and selected OPDs).

3. To determine the average time spent by patients at the registration counter and in selected OPDs.

Materials and Methodology

Study Design and Duration

This descriptive cross-sectional study was conducted from August 2023 to August 2024 at MGM Medical College and Hospital, Kamothe, Navi Mumbai. It assessed the time-motion dynamics of hospital services, including registration and OPDs (surgery, medicine, orthopaedics), and patient satisfaction.

Study Area

Data were collected from the Registration counter and OPDs (General Surgery, General Medicine, Orthopaedics) of MGM Hospital.

Sample and Sampling Technique

Sample Size: The pre-testing showed that 6 proforma (6 patients) can be filled up every day Given approximately 52 days for data collection during data collection period, the data is expected from 312 patients. However, this study is restricted to General Medicine, General Surgery and Orthopaedic OPDs, the data will be collected from 184 patients, after considering OPD patients in these selected OPDs and 10% non-response rate.

- **Inclusion Criteria:** Patients attending the Registration counter for General Surgery, General Medicine, and Orthopaedics OPDs.
- **Exclusion Criteria:** Emergency service seekers and non-consenting patients.

Study Tool

A structured questionnaire in English was used to collect data on:

- **Registration Counter:** Time spent, satisfaction, and clarity of information.
- **OPD:** Arrival time, consultation times, waiting times, and patient satisfaction.

Operational Definitions:

- **Waiting Time:** Total time from registration to departure.
- **New Patients:** Patients with no prior hospital interaction.
- **Follow-up Patients:** Patients previously registered with the hospital.
- **Value-Adding Time:** Time engaged with hospital staff.
- **Non-Value Adding Time:** Waiting time before consultation.

Data Collection

Data were collected via direct observation and a structured questionnaire. Time was recorded and analysed using mean and percentages in MS Excel.

Execution of the Study:

The study was approved by MGM Medical College and Hospital, Kamothe, and received full cooperation from the hospital administration. Data collection involved observing and timing specific processes within the hospital. A stopwatch was used to record the duration of the Registration process, from patient arrival to receiving their case paper. Following registration, patients were tracked to the outpatient departments (OPDs) of interest—surgery, medicine, and orthopaedics. Times for arrival at each OPD, entry into the OPD room, and consultation initiation and conclusion were recorded.

Data were collected on significant events, such as patient arrivals and transitions, and used to calculate total waiting times, value-adding time (time with the healthcare provider), and non-value adding time (waiting before consultation). The timestamps were then organized in a database and analysed to identify patterns and trends in waiting times across the different selected hospital services.

DATA ANALYSIS AND INTERPRETATION:

Table: Socio-Demographic Characteristics and Interpretations of Respondents (N=184)

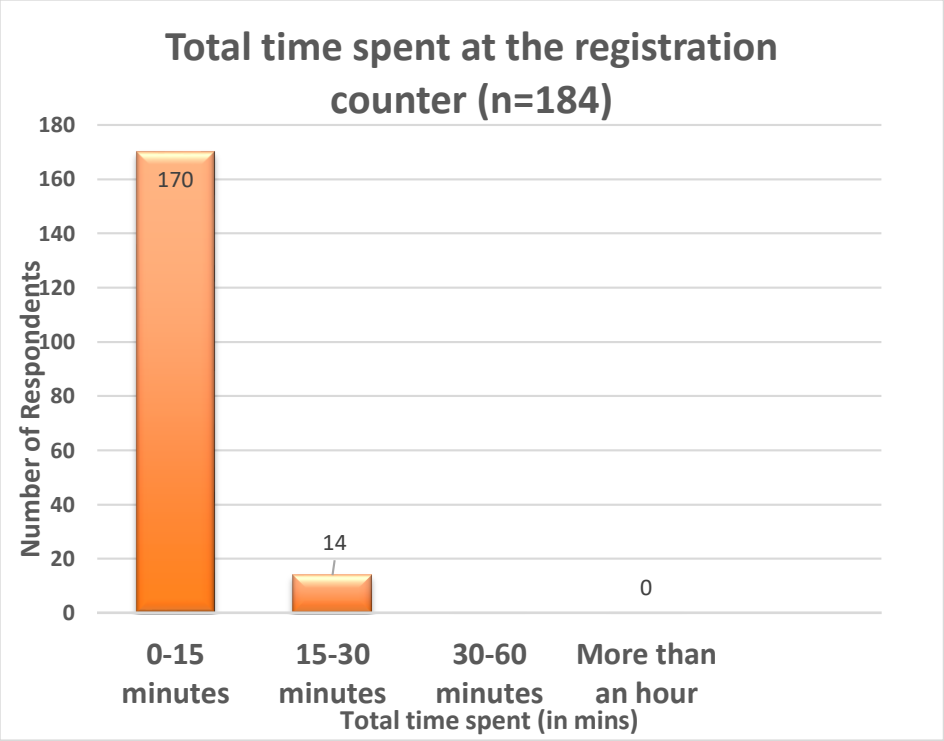
Description	Interpretation
Age of Respondents (n=184)	Majority are 31-40 years (28%), followed by 51-60 years (22%). Younger patients (18-20) are 10%, and those over 61 are 4%.
Gender of the Respondents (n=184) .	59% male and 41% female, indicating a higher male participation
Marital Status of Respondents (n=184)	80% married, 15% unmarried, 5% widowed. Shows higher engagement from married individuals.
Educational Status of Respondents (n=184)	13% illiterate, 35% primary education, 18% secondary, 23% high school, 11% graduated. Most have completed primary education.
Purpose of Hospital Visit (n=184)	Main reasons: initial consultations (47.8%), follow-ups (33.2%), diagnostic tests (17.4%), medical certificates (1.6%).

Table 1: Mean waiting time of selected hospital services (Registration, Medicine OPD, Surgery OPD, Orthopaedics OPD) in minutes.

DEPARTMENT	*MEAN OF WAITING TIME IN MINUTES.*
1. REGISTRATION COUNTER	***8.31 mins***
2. MEDICINE OPD	***38.93 mins***
3. SURGERY OPD	***50.84mins***
4. ORTHOPAEDICS OPD	***23.1mins***

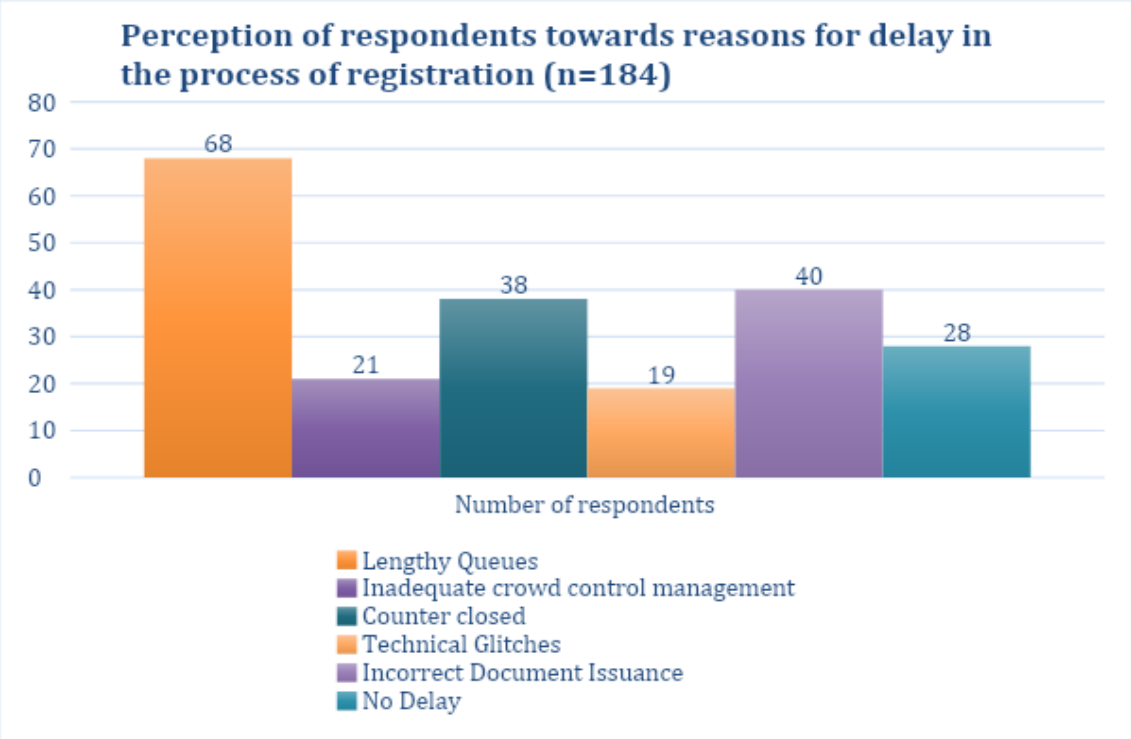
Interpretation: The shortest waiting time is at the Registration Counter (8.31 minutes), while the longest is at the Surgery OPD (50.84 minutes).

Graph 1: Total time spent by the Respondents at the Registration counter (n=184)



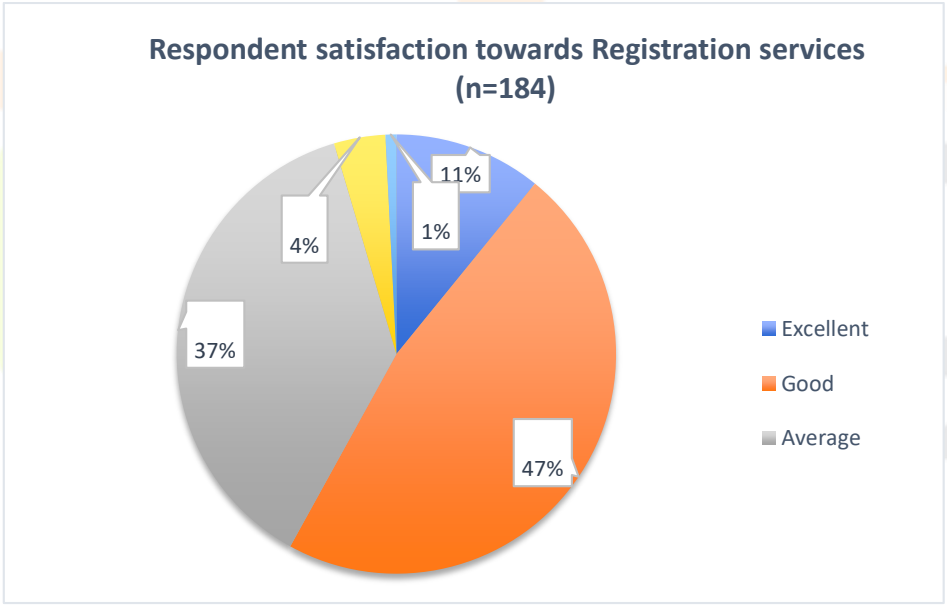
Interpretation: Most respondents (92%) spent 0-15 minutes at the registration counter, indicating a generally efficient registration process.

Graph 2. Perception of respondents towards reasons for delay in the process of registration (n=184)



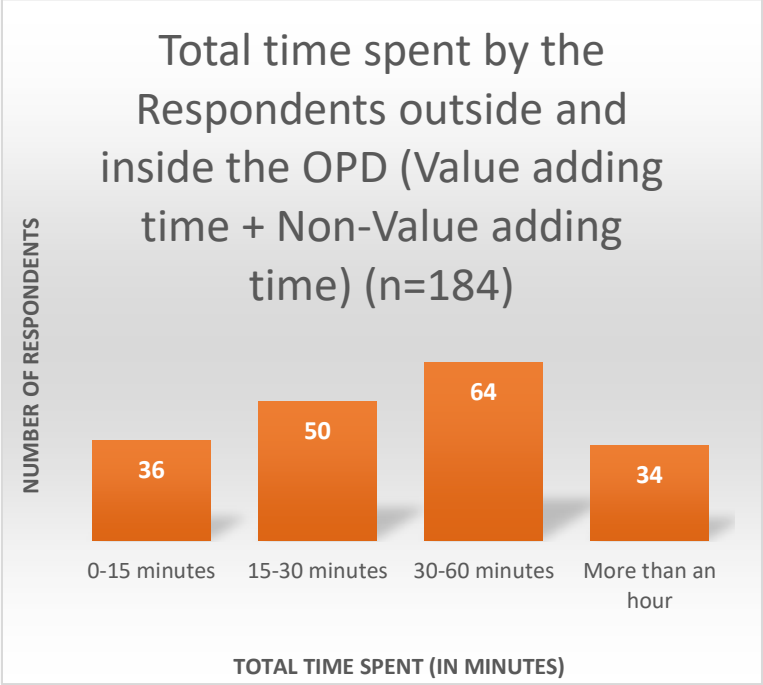
Interpretation: The most common reason for delay was lengthy queues (37%), followed by incorrect document issuance (21.7%) and the counter being closed (20.6%).

Figure 1. Respondent satisfaction towards Registration services (n=184)



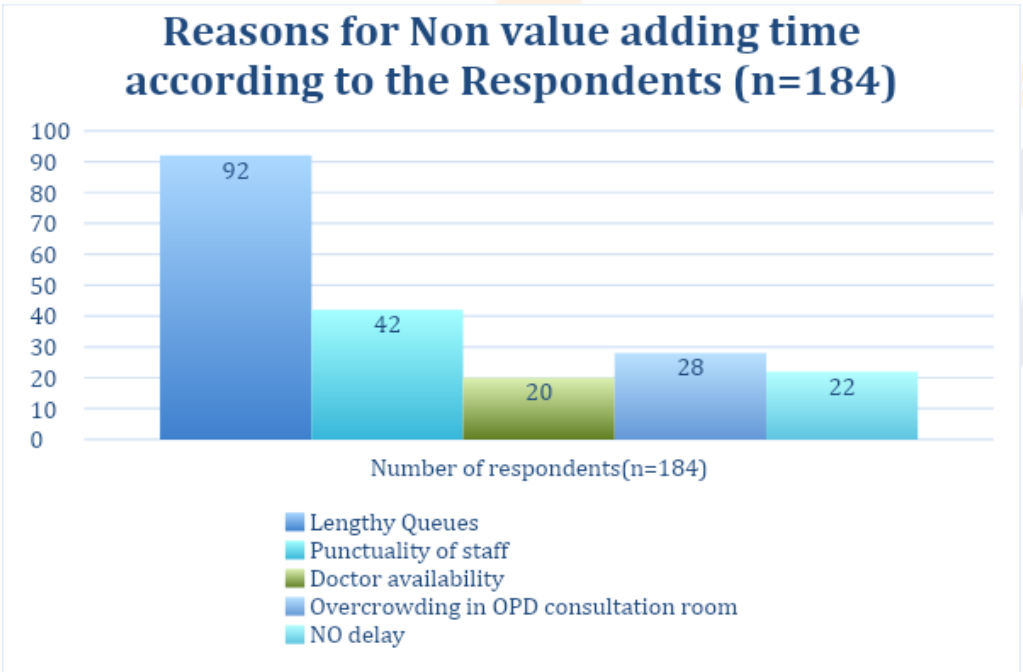
Interpretation: Most respondents rated registration services positively: 47.3% as good and 10.9% as excellent. However, 41.3% found the services average or below, indicating areas for improvement.

Graph 3. Total time spent by the Respondents outside and inside the OPD (Value adding time + Nonvalue adding time) (n=184)



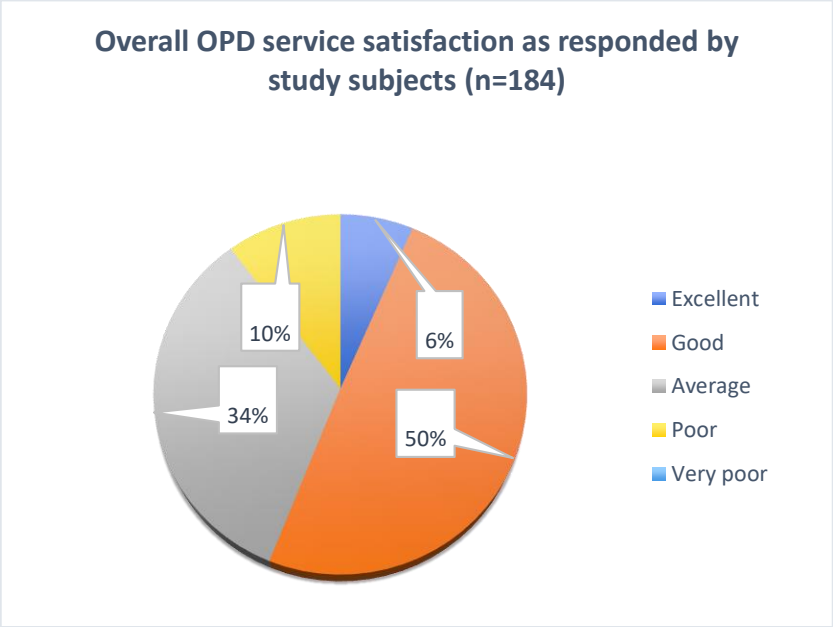
Interpretation: Most patients (34.8%) spent 30-60 minutes at the OPD. While 19.6% had a quick visit (0-15 minutes), 18.5% experienced visits over an hour, indicating areas for potential efficiency improvements.

Graph 4. Reasons for Non value adding time according to the Respondents (n=184)



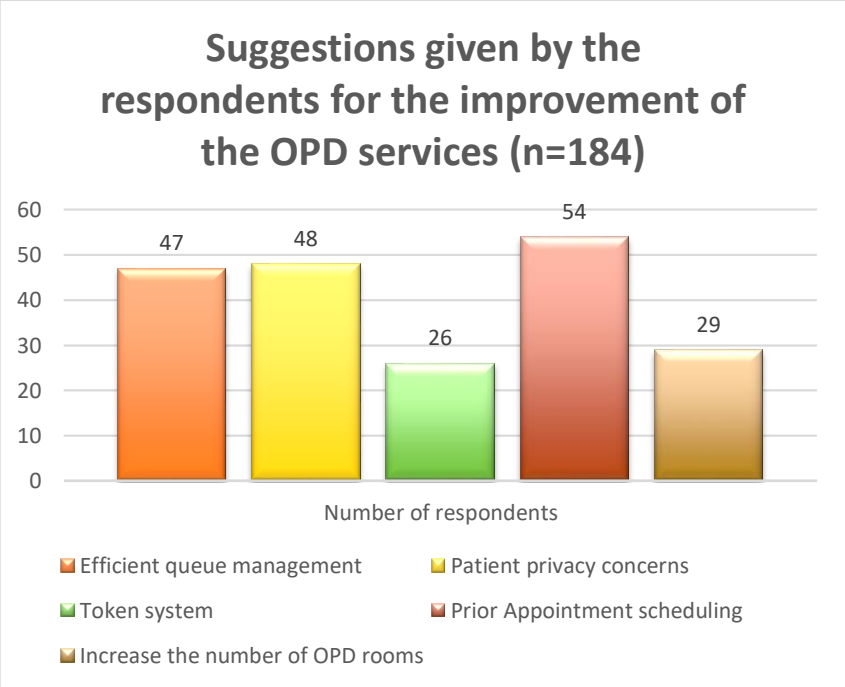
Interpretation: Graph 4 shows the main reasons for non-value-adding time outside the OPD. Lengthy queues were the top concern for 50% of respondents, followed by staff punctuality (22.8%) and doctor availability (10.9%). Overcrowding was noted by 15.2%, while 12% reported no delays.

Figure 2. Overall OPD service satisfaction as responded by study subjects (n=184)



Interpretation: The majority of respondents rated OPD services positively: 49.5% as good and 6.5% as excellent. However, 33.7% found the services average and 10.3% rated them poor, highlighting areas for potential improvement.

Graph 5. Suggestions given by the respondents for the improvement of the OPD services.



Interpretation: Graph 5 shows patients mainly suggest prior appointment scheduling (29.3%), queue management (25.5%), and privacy improvements (26.1%). Other recommendations include a token system (14.1%) and more OPD rooms (15.7%).

Discussion:

Hospital services encompass all actions taken to help patients stay well or recover, with quality measured by factors such as prompt appointments and appropriate care. An essential aspect of service quality is waiting time, as shorter waits generally enhance patient satisfaction.

This study measured the waiting time from registration to OPD consultation, distinguishing between value-adding time (directly related to medical care) and non-value-adding time (waiting). Graph 1 shows that 92% of respondents spent 0-15 minutes at the registration counter, indicating a relatively efficient process. Comparative data from Dr. S.N. Saoundara Rajan's study showed that 66% of respondents waited 10 minutes or less, suggesting similar efficiency.

The mean waiting time for registration was 8 minutes 31 seconds, while for combined OPDs it was 37 minutes 52 seconds. This contrasts with Sengupta et al.'s findings of 1 hour 15 minutes for OPD areas and 10 minutes 45 seconds for registration. To enhance efficiency, hospitals could implement digital solutions and optimize staffing during peak times.

Figure 1 reveals varied perceptions of registration pace: 41% found it normal, 26% fast, 20% slow, 11% very slow, and 2% unbearable. Farah NAAZ's study showed similar patterns, suggesting areas for improving registration speed.

Graph 3 illustrates that 36.4% of respondents spent 0-15 minutes waiting outside the OPD, with 12% waiting over 60 minutes. Mensur Biya's study found an average waiting time of 31 minutes, highlighting a need for better scheduling and staffing.

Figure 1 shows that 11% rated registration services as excellent, 47% as good, 37% as average, 4% as poor, and 1% as very poor. This indicates overall positive feedback but also areas for improvement. Comparatively, Sengupta et al. found 40% rated their experience as very good, suggesting different satisfaction levels.

Figure 2 shows 6.5% rated overall OPD service as excellent, 49.5% as good, 33.7% as average, 10.3% as poor, and none as very poor. This aligns with Rajan's findings of high satisfaction but also indicates room for enhancement.

In summary, improving hospital services involves reducing waiting times, optimizing registration and OPD processes, and addressing patient feedback to enhance overall satisfaction.

Conclusion

This study highlights key areas for improvement in patient waiting times and satisfaction. The average Registration waiting time of 8 minutes is positive, but patients face longer delays in OPD services, especially in Surgery OPD, with an average wait of 51 minutes. Inefficiencies are noted in non-value-adding time, with 14% of patients waiting 15 to 30 minutes at Registration and 36.4% outside the OPD. Streamlining queue management, enhancing staff training, and improving appointment scheduling can help address these delays.

While most patients are satisfied with their overall experience, 37% are dissatisfied with waiting times. Addressing these concerns through targeted improvements can enhance patient satisfaction and create a more efficient care environment.

RECOMMENDATIONS

1. Optimize Queue Management: Implement advanced systems to reduce wait times at registration and OPDs.

2. Enhance Staff Training and Punctuality: Invest in training and ensure staff punctuality to improve service quality.

3. Streamline Appointment Scheduling: Use advanced scheduling systems to minimize waiting times and enhance patient flow.

4. Increase OPD Room Capacity: Expand OPD rooms to reduce overcrowding and waiting times.

5. Regularly Evaluate Services: Continuously gather feedback and evaluate processes to address patient concerns and improve efficiency.

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