

**“TO STUDY THE WORKFLOW OF THE DIALYSIS
DEPARTMENT AND COMPARE THE CHANGES
AFTER IMPLEMENTATION OF APPOINTMENT
SCHEDULE”**

Dissertation Submitted to



The IIHMR University, Jaipur

for the partial fulfilment for the award of the degree of
Master of Business Administration (MBA) in Hospital and Health Management

By,

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Under the Supervision and Guidance of

Dr. Goutam Sadhu

Professor

DECLARATION BY STUDENT

I hereby declare that this dissertation titled **“To study the workflow of the dialysis department and compare the changes after implementation of appointment schedule.”** 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 Information derived from the published or unpublished work of others has been duly acknowledged in the text.

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CERTIFICATE

This is to certify that Resham Goutam in partial fulfilment 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 IIHMR University, Jaipur during March 22, 2021 to June 19, 2021.

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CERTIFICATE

This is to certify that dissertation titled **“To study the workflow of the dialysis department and compare the changes after implementation of appointment schedule.”** is a record of the research work undertaken by Resham Goutam 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 his/her approach to the research study has been sincere, scientific, and analytical.

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ABSTRACT

BACKGROUND:

Dialysis department in a hospital usually caters mostly to chronic patients who often have high blood sugar levels and dyselectrolytemia. Due to these circumstances the patients need to be provided good quality of care.

A patient spends close to 5:00–5:30 hours in the department as dialysis which is time consuming. If the patient isn't provided appropriate treatment or the treatment is prolonged, the patient become dissatisfied. The schedule of treatment which was followed in the department was first come first serve. The treatment schedule changed to appointment basis. Objective of this study was-

1. To understand the workflow of the dialysis department in order to minimize the maximum waiting time for patients to start the dialysis session.
2. To quantify the effectiveness of change in patients scheduling on overall waiting time from arrival to start of treatment.

METHODOLOGY:

The study was a cross sectional and observatory study. The data was collected through observation and time study. The gathered data was filtered using excel to find out patients whose data was recorded continuously for 4-5 days in 2 weeks.

RESULT: The patients were shown to have reduced waiting time till the start of the treatments. The average time between patient arrivals, to the time the patient enters for treatment had reduced to 25 minutes.

CONCLUSION:

Based on the observation of the patient's flow in the department and generated results, it can be concluded that due to the positive relation between the staff and the patients, the transition from earlier form of scheduling to the new appointment-based scheduling system, with staff facing some minor challenges in educating the patients & their relatives. The patients were visually satisfied, this caused the patients to follow the treatment on their own and as the week progressed the patients started coming half an hour before their dialysis schedule. Hence, reduction in waiting time of the patient and improvement in the patients' approach towards treatment.

KEYWORDS: haemodialysis, patient satisfaction, scheduling, waiting time

ACKNOWLEDGEMENT

At the outset, I would like to articulate this project as small journey which was remarkable learning experience for me. The successful completion of this project is only because of the extraordinary support, guidance, counselling and motivation from my respectable staff, of IIHMR University.

This journey could not be completed without the support of my family and friends. I express my deep gratitude to Dr. Goutam Sadhu (Professor) mentor for his constant and timely support and supervision during my project. Through the support provided by him, I have imparted knowledge on the avenues which this project has opened and explored. His directions in making this project at this stage of successful completion.

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MBA-HM24

TABLE OF CONTENTS

S. No.	Content	Page No.
1.	Introduction	11, 12
1.1	Research Gap	13
1.2	Research Questions	13
1.3	Research Objectives	13
2.	Review of Literature	14-17
3.	Methodology	18, 19
4.	Results	20 - 28
4.1	Analysis	20 - 28
5.	Discussion	29-32
6.	Conclusion	33
7.	Recommendations	23, 34
8.	References	35-37
9.	Annexure	38

LIST OF FIGURES

Figure 4.1 – Patient time from arrival to start of treatment (Pratul R)	14
Figure 4.2 – Patient time from arrival to start of treatment (Anjana S	15
Figure 4.3 – Patient time from arrival to start of treatment (Karthik)	16
Figure 4.4 – Patient time from arrival to start of treatment (Damodar)	17
Figure 4.5 – Patient time from arrival to start of treatment (Jagdeesh M)	18
Figure 4.6 – Patient time from arrival to start of treatment (Kamla)	19
Figure 4.7 – Patient time from arrival to start of treatment (Nutan T)	20
Figure 4.8 – Patient time from arrival to start of treatment (Sharda K)	21
Figure 4.9 – Average time for dialysis process	22
Figure 6.1 - Flow Chart of Outpatient visiting a for dialysis in Hospital.....	29

ABBERRIATIONS/ACRYNOMS

- **CKD:** Chronic kidney disease
- **NCD:** Non-communicable diseases
- **PD:** Peritoneal dialysis
- **IPD:** Inpatient Department
- **OPD:** Out-Patient Department
- **HD:** Haemodialysis
- **NABH:** National Accreditation Board for Hospitals & Healthcare Providers
- **AFR:** Acute renal failure

1. INTRODUCTION

With the increasing burden of non-communicable diseases like diabetes and hypertension that account for 40–60% cases of CKD (Rajapurkar MM, John GT et al, 2012), the burden of chronic kidney disease, which is directly indirectly associated with these diseases, is also escalating. The number of deaths attributable to CKD in India rose from 0.59 million in 1990 to 1.18 million in 2016 (Xie Y, Bowe B et al, 2018). According to the 2018 estimate, the number of patients on chronic dialysis in India at about 175,000, giving a prevalence of 129 per million population (Jha V, Ur-Rashid H et al, 2019). A systematic review estimated that about two-thirds of all patients with kidney failure died without receiving dialysis in 2010 (Liyanage T, Ninomiya T et al, 2015).

Dialysis is a medical procedure required to remove the waste products (toxins) and excess fluid that is accumulated in the blood when the kidneys of patients with kidney disorders cannot perform these body functions naturally. This is referred to as renal replacement therapy.

The procedure of dialysis involves attaching a tube to a patient's arm via needle, through which blood passes into an external machine that performs the filtering function before passing it back into the arm along another tube. At dialysis centers, this is usually carried out 2-3 days a week, with each session lasting around 4-5 hours. It is known that the waiting times at these centers are long and patients had to wait during their visit that results in overcrowding in the waiting area, which often gives rise to patient dissatisfaction or sometimes could lead to risk in patients' health.

The out-patient department (OPD) of Nephrology at hospitals, caters to the healthcare needs of the patients who require dialysis with the help of highly qualified & experienced doctors, nurses, paramedical staff, technical staff, and state-of-the-art hemodialysis machines, high capacity reverse osmosis water plant with the facility to provide bedside dialysis to all critical patients.

The hospital aims to serve the patients most effectively as possible when the patient is in the utmost need of it. A person visiting a hospital for dialysis is already in an uncommon mental state due and the last thing he/she would want is to wait. But with the continuous increase in demand and complexity of the procedure errors happens that in turn causes delay in service and overcrowding.

In Indian hospitals, generally, the proper appointment time for dialysis is not given to the patients, instead patients are treated in first come first serve basis, which results in long waiting times, overcrowding, hence patient dissatisfaction. The average patient coming for dialysis, spends 15 hours per week on dialysis procedure (waiting time + treatment time), extrapolating to 65 hours monthly and 780 hours on dialysis annually, which is equivalent to 1 month (32.5 days) of every year tethered to the dialysis procedure. In this, on average 1 hour is spent in the waiting area, which if with some intervention is reduced to 20 minutes can save one-week (5 to days) patient's time.

Long waiting time in hospitals remains the most significant problem faced by our health care system, it may give poor overall impression of the setting. As we know waiting time is a significant component of patient satisfaction and is an increasingly important parameter in assessing the quality of care. Understanding the most important factors impacting overall satisfaction can help health care administrators and providers improve patient care.

Therefore, a suitable system should be designed with the assistance of technology and taskforce to minimize the trouble to patients waiting for dialysis and to maximize the effectiveness and efficiency of resources and capacity. Reducing delays and making sure that receive right care at right time will have a significant beneficial effect on the quality of care and with this reduction in waiting time for dialysis would not only improve the patient satisfaction but also reduce the health risk for patients.

1.1. RESEARCH GAP –

Most of the studies done for assessing the satisfaction of the patients by the operations department of the hospital overlook dialysis day-care services. Patients coming to the dialysis center of the hospital must wait for hours for their turn.

Considering that the waiting time is an important factor in patient satisfaction which has not been widely studied for dialysis centers. The study was carried out with the purpose to compare the pre & post-intervention changes in overall waiting time from the arrival of the patient to the start of the treatment.

1.2. RESEARCH QUESTION –

- Does changes in patient scheduling affect the length of waiting time for the patients coming for hemodialysis at the hospital?
- Does patient scheduling in the hemodialysis service centers presents challenges in operations management?

1.3. RESEARCH OBJECTIVE –

To accomplish the above-mentioned criteria the objectives are set which includes-

- To understand the workflow of the dialysis department in order to minimize the maximum waiting time for patients to start the dialysis session.
- To quantify the effectiveness of change in patients scheduling on overall waiting time from arrival to start of treatment.

2. REVIEW OF LITERATURE-

S.No.	Authors (year)	Study Design	Objective	Key Findings
1.	Door ZH, Dr. Mukhtar HF	Cross-sectional descriptive study	The research was conducted at a selected dialysis unit to evaluate the satisfaction of patients with care.	The majority of the respondents (86.9%) were rated high nurses' willingness and flexibility in meeting their needs and nurses helping to understand and solve their problems rated low (52.7%). The analysis shows that residence, gender and occupation were red overall satisfaction scores ($p < 0.05$) and income.
2.	Batra R, Deswal BS	Cross-sectional study	The study was conducted to explore prime causes of length of time for medical treatment in OPD and also to provide the best strategy which can improve the appointment system to maximize the effectiveness and efficiency of resource and capacity.	It was observed that with the change in the appointment system for physicians by applying 'doctor on call' system, idle time for doctors has reduced, however patient waiting time has increase as a result.
3.	Jamalizadeh Z, Meshkani F, Naami A	Questionnaire- based survey study	The study was carried out in Iranian hospitals to determine the factor of most importance which can influence patients' satisfaction.	The factor of most importance which can influence patients' satisfaction are the management and organizational issues, followed by issues connected with physicians, nurses and employees and patients expect the

				officials of hospitals to reduce waiting time for their services.
4.	Turner ME, Kher KK, Reilly KM,	Cross-sectional questionnaire- based study	The objective of the study was to reduce costs and to improve the quality of care in a paediatric dialysis unit by implementing Continuous Quality Improvement Program.	After the Continuous Quality Improvement Program in paediatric peritoneal dialysis unit, it was observed that there is a significant reduction in clinic visit time by 44%. Also decrease in average waiting time and improvement in waiting time has been observed.
5.	Chuang HF, Chan SJ, Lin YC	Questionnaire- based survey study	The study was conducted with the aim to reduce the waiting time length for patients undergoing peritoneal dialysis (PD)	After the implementation of computerized appointment system, designated arrival times, rearrange the waiting areas and integrated the pre-visit preparation process, the patient waiting time had shortened and satisfaction score has significantly improved.
6.	Davis D, Pineda R, Waller A, Winthrop K	Cross- sectional study	The study was conducted to present substitute designs and suggestions which could be used in treatment delays reduction in the hemodialysis process.	It was found that the main reason of delays exists within the process including the water treatment system, tubing system, the dialyzer, and the needle attachment process.
7.	Nappo RW, Ross EA	Descriptive cross- sectional study	The study was carried out with the objective to optimize schedules for every dialysis	It was observed that the principles of Queuing theorem can be adopted to optimise haemodialysis scheduling that can

			process step by incorporating timing and workflow to design a new schedule, rather than the whole-shift blocks at baseline.	improve facility efficiency, minimises the long wait time dissatisfier, and is associated with improved URRs with more patients reaching target clearance thresholds.
8.	Yu B and Wijesekera D.	Descriptive study	The study aimed to create a workflow model of a functional diaysis center using an open-source software for the EMR components and workflow management system.	A properly enforced workflow system which complies with local or national standards and policies can improve the quality of care provided to dialysis patients, also provide flexibility that caregivers need to continue treatment
9.	Hingwala J, Tangri N, Rigatto C, Komenda P	Secondary	To was aimed to review quality improvement concepts and operations research that could provide clinician administrators to improve both efficiency and quality in facility based hemodialysis units	It was found that by creating scorecards and by correct utilization and application of process mapping techniques and LEAN principles, the delivery of haemodialysis care has improved.
10.	Dr. Iqbal MZ, Dr. Aamir M, Dr. Abbas S.	Descriptive cross-sectional study	Objective of this study was to determine the patient waiting time and to study the satisfaction level of patients on examination by doctor.	It was observed that patient satisfaction decrease with as the waiting time increases and majority of the Patients are satisfied with the behaviour of the doctors and services available at the OPD.
11.	Matthias Keil	Descriptive cross-sectional study	The aim of the study was to identify the benefits of introducing a treatment monitoring system into a dialysis ward for users and	Introducing a treatment monitoring system reduces the number of manually performed steps directly influencing the treatment (e.g. calculations and setting the dialysis

			patients and to analyse the workflow steps that are to be optimized and automated.	device). This reduces the risk of treatment errors and leads to more confidence of caretakers. The documentation quality is improved, leading to better data security and higher confidence of the nursing personnel.
12.	Ke Li Yew	Questionnaire-based survey study	This study aimed at documenting the impact of wait times at the waiting room and on the treatment chair, technical skills and interpersonal skills, and the environment on patient satisfaction in infusion center and dialysis center,	The study found that majority of the patients rated their visit to the infusion center and dialysis centers exceeded their expectations or it was what they expected, that could be credited to many factors including

3. METHODOLOGY

Study design: This project consists of real time data collected by direct observation method (longitudinal study). The time study was performed on patients who were there for treatment of dialysis department.

Study was regarding the change in scheduling of patients due to dissatisfaction of patients, as a result of long waiting time for treatment.

The waiting time was occurring between arrival time and in time (treatment) of patients for treatment. Observatory study was undertaken for 2 weeks in the dialysis department for the 1st and 2nd shift of treatment for patients.

Patient appointment times are written down in a white board in the dialysis department. Over the first week as and when patients came to the department where educated about the change in schedule.

The patients were instructed to come on time for the treatment. The appointment times are given at the end of each treatment so the patient could allot separate times in the coming week especially for treatment.

Study population: Patients attending Out-patient Department of Nephrology for Dialysis

Study site: The study was conducted in a NABH accredited, 300 bedded multispecialty, tertiary care hospital situated in the metropolitan urban area having population of 12.7 lakhs.

Sample size: 20 patients, the data collected from excel was filtered to find patients whose data was recorded continuously for 4-5 days in 2 weeks.

Sampling technique: Convenient sampling

Inclusion Criteria:

- All age and both sex of patients with regular visit of 2-3 visit a week for dialysis are considered.
- Only Ambulatory-care or OPD patients are considered for the study.

Exclusion Criteria:

- Irregular patients for dialysis are excluded from the study.

- IPD patients are excluded from the study

Data collection tool: Tracker sheet were used to note down the duration in times for the appointment, token, arrival and in time for patients. The times were noted as and when patients were arriving at the hospital and respectively their movements and time were noted down.

Data analysis: The collected data were entered into Microsoft Excel and analysed using various graphs.

Study duration: 15 day

4. RESULTS-

4.1. DATA ANALYSIS

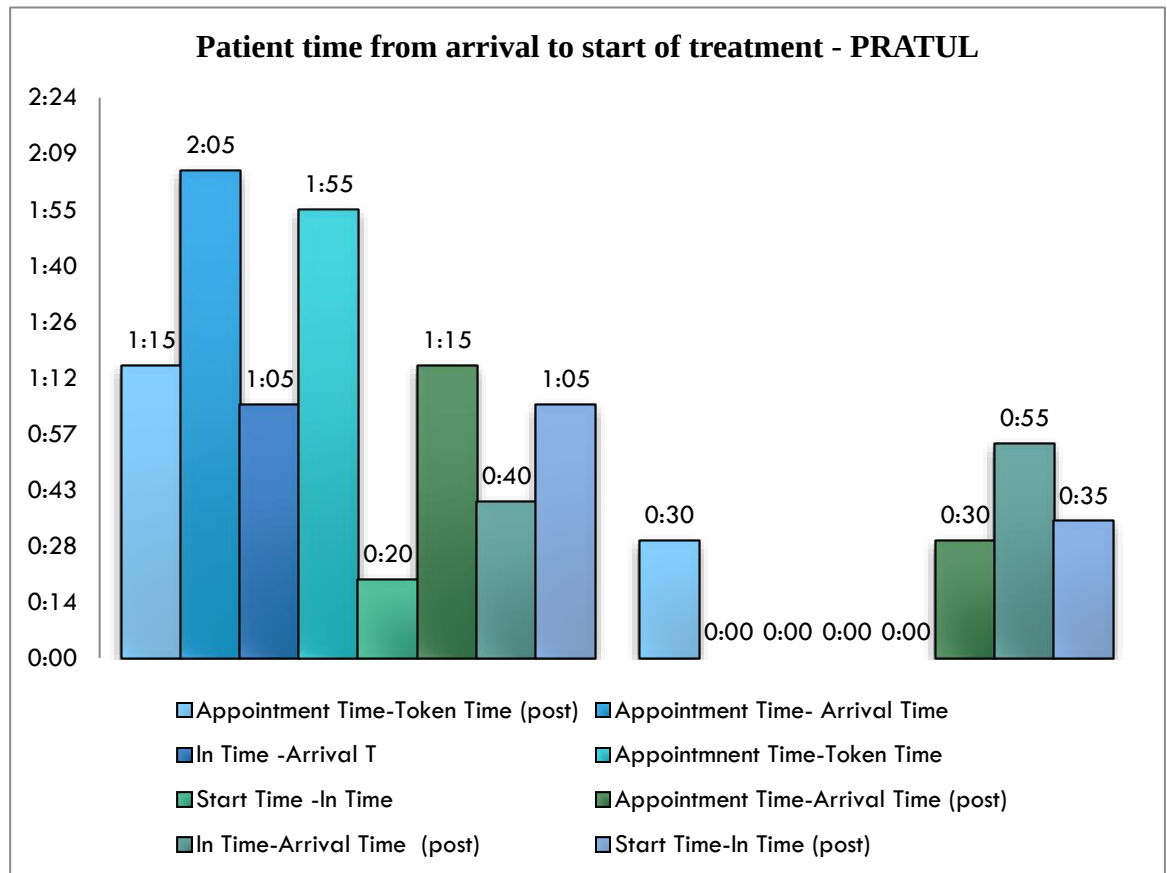


FIGURE 4.1.: PATIENT TIME FROM ARRIVAL TO START OF TREATMENT

INFERENCE:

The above figure depicts 4 variables which are involved in the overall time for each patient. The graphs have been made patient wise so as to signify the change in times after scheduling time changes accurately. The main variable which is concerned with patient satisfaction is patient arrival time to in time (for treatment). In this graph, the in time to arrival time was 1 hour before change in schedule and after the change in schedule of appoint time and patient education the time from arrival to in time had come down to 40 minutes. [fig.4.1]

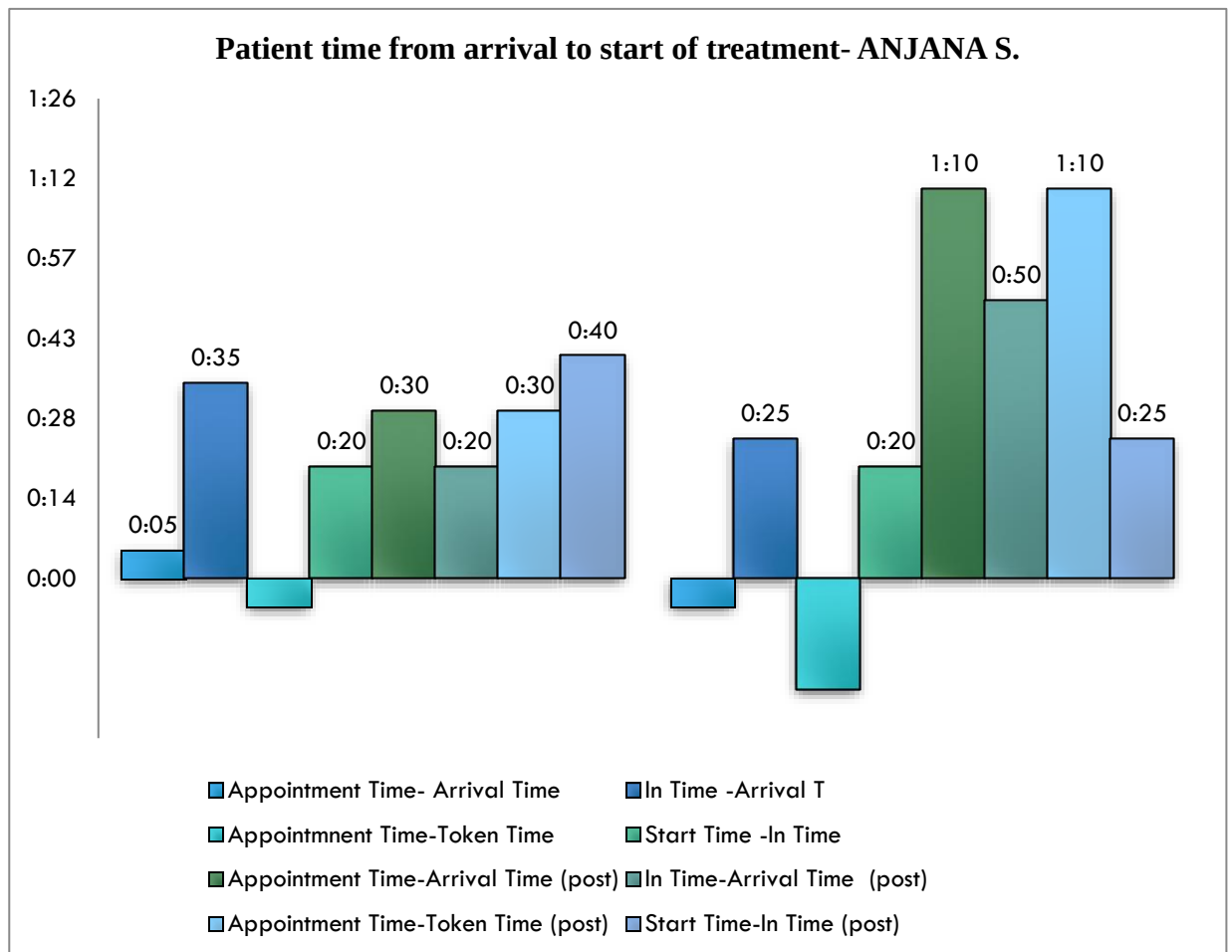


FIGURE 4.2: PATIENT TIME FROM ARRIVAL TO START OF TREATMENT

INFERENCE:

This figure depicts appointment time to arrival time, in time to arrival time, appointment time to token time, and start time to end time of patient. Patient arrival time to in time (for treatment) often is the main cause of dissatisfaction for patients. After the change in schedule of appoint time, and patient education the in time to arrival time has reduced from 35 minutes to 20 minutes for this particular patient, which shows that patient education and change schedule of patients has reduced time significantly. This graph also shows that in time to arrival time has become 50 minutes which was due to shortage of water in the hospital. [fig.4.2]

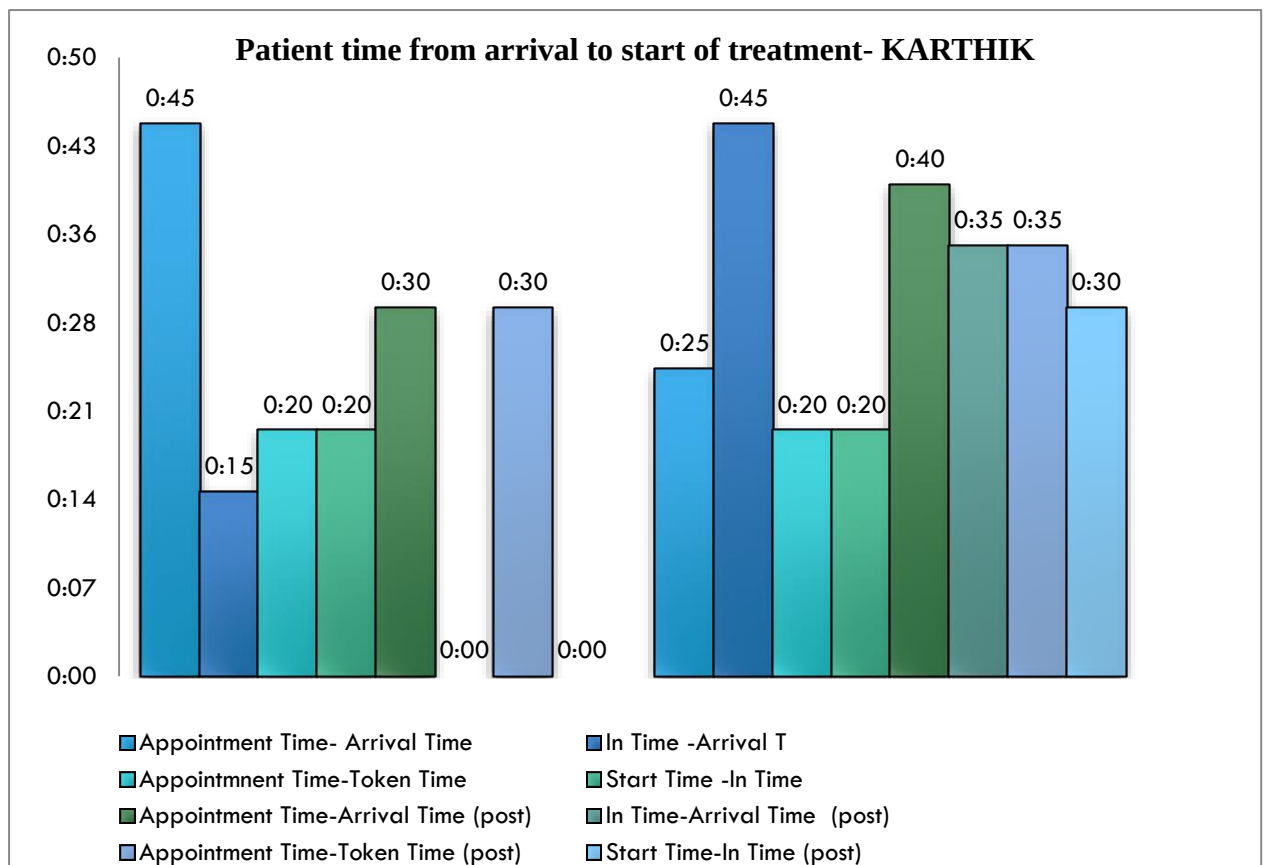


FIGURE 4.3: PATIENT TIME FROM ARRIVAL TO START OF TREATMENT

INFERENCE:

This figure depicts appointment time to arrival time, in time to arrival time, appointment time to token time, and start time to end time of patient. Patient arrival time to in time (for treatment) often is the main cause of dissatisfaction for patients. After the change in schedule of appoint time, and patient education the in time to arrival time has reduced from 45 minutes to 35 minutes for this particular patient, which shows that patient education and change schedule of patients has reduced time significantly. [fig.4.3]

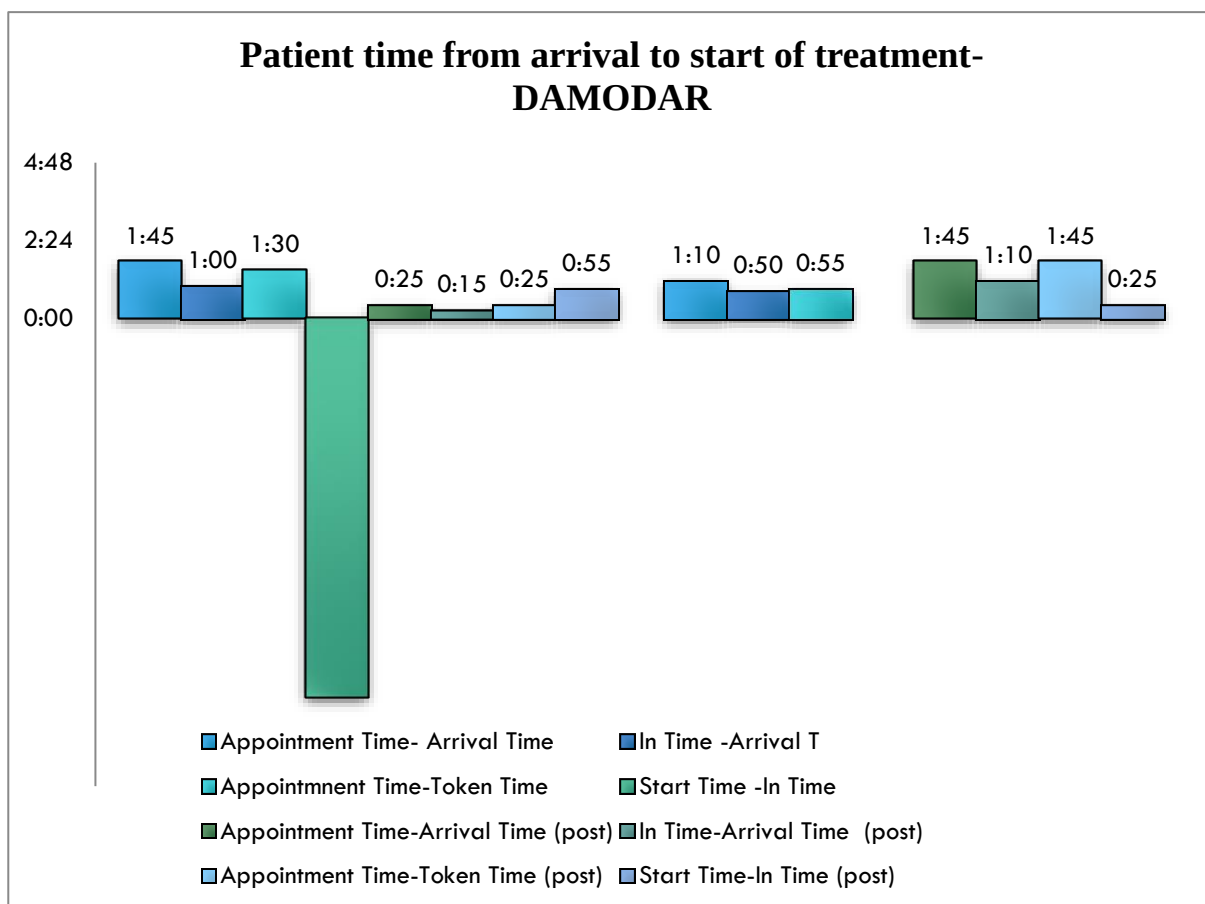
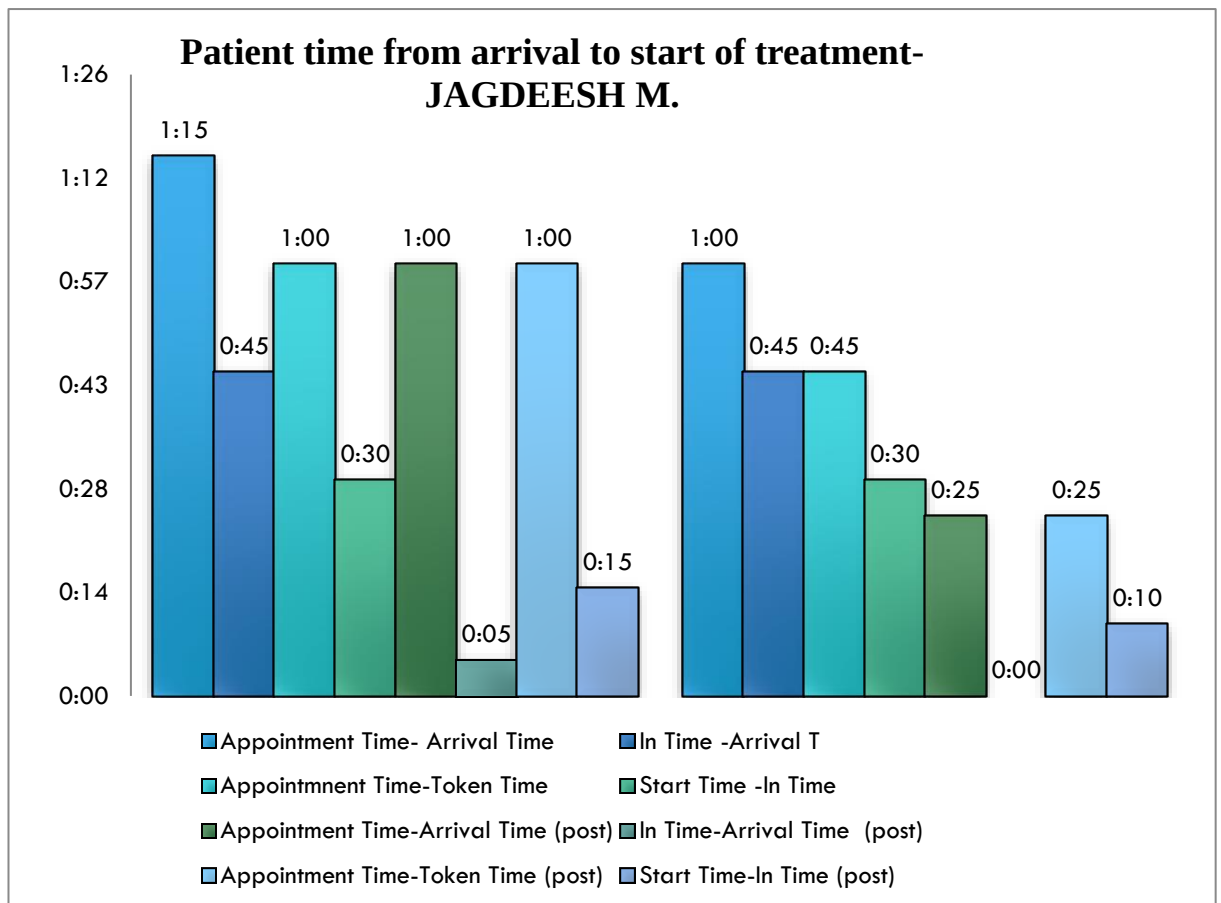


FIGURE 4.4: PATIENT TIME FROM ARRIVAL TO START OF TREATMENT

INFERENCE:

This figure depicts appointment time to arrival time, in time to arrival time, appointment time to token time, and start time to end time of patient. Patient arrival time to in time (for treatment) often is the main cause of dissatisfaction for patients. After the change in schedule of appoint time, and patient education the in time to arrival time has reduced from 1 hour 15 minutes to 1 hour 5 minutes for this particular patient, which shows that patient education and change schedule of patients has reduced time significantly. This patient has been observed to come quite earlier than appointment times. [fig.4.4]



**FIGURE 4.5: PATIENT TIME FROM ARRIVAL TO START OF
TREATMENT**

INFERENCE:

This figure depicts appointment time to arrival time, in time to arrival time, appointment time to token time, and start time to end time of patient. Patient arrival time to in time (for treatment) often is the main cause of dissatisfaction for patients. After the change in schedule of appoint time, and patient education the in time to arrival time has reduced from 32 minutes to 20 minutes for this particular patient, which shows that patient education and change schedule of patients has reduced time significantly. [fig.4.5]

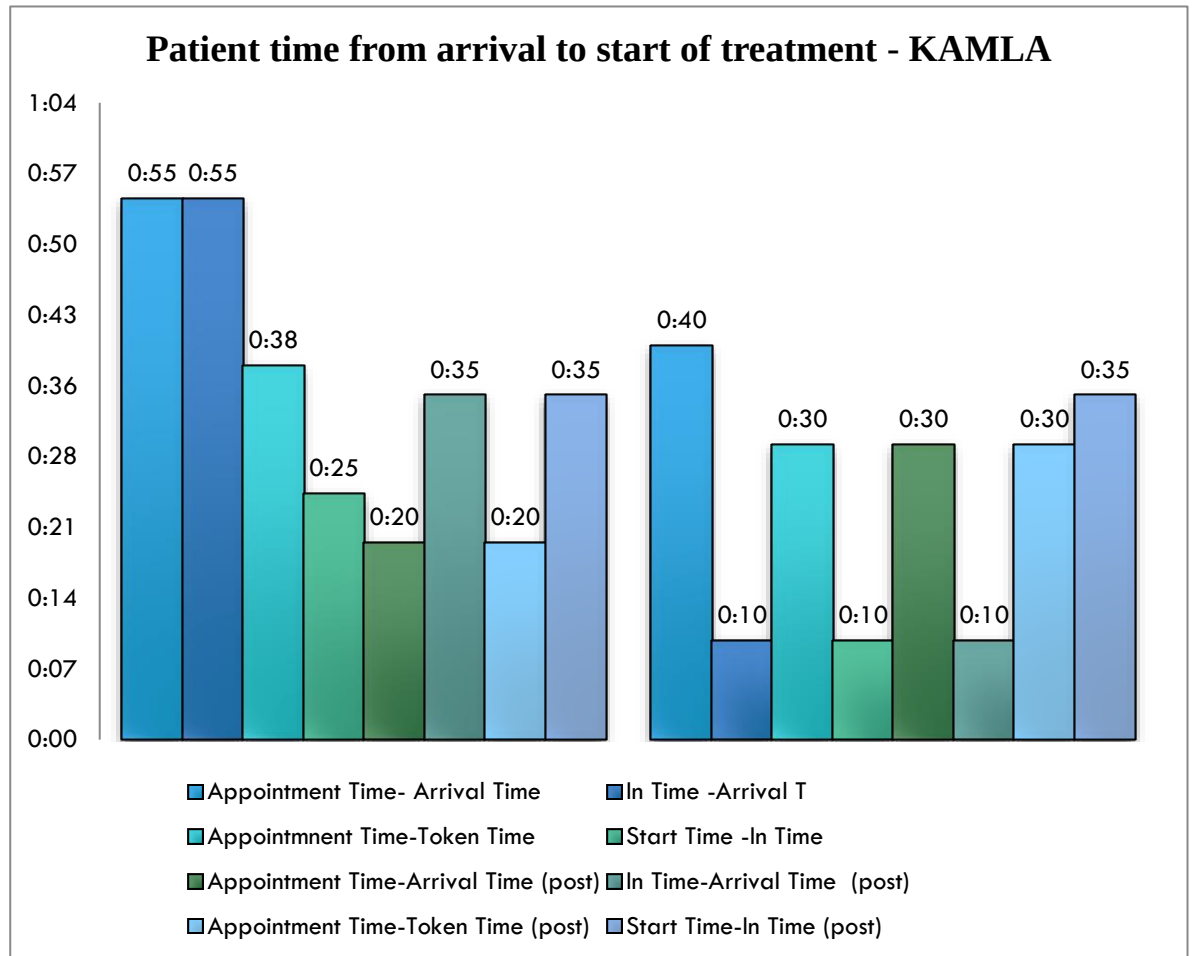


FIGURE 4.6: PATIENT TIME FROM ARRIVAL TO START OF TREATMENT

INFERENCE:

This figure depicts appointment time to arrival time, in time to arrival time, appointment time to token time, and start time to end time of patient. Patient arrival time to in time (for treatment) often is the main cause of dissatisfaction for patients. After the change in schedule of appoint time, and patient education the in time to arrival time has reduced from 45 minutes to 35 minutes for this particular patient, which shows that patient education and change schedule of patients has reduced time significantly [fig.4.6]

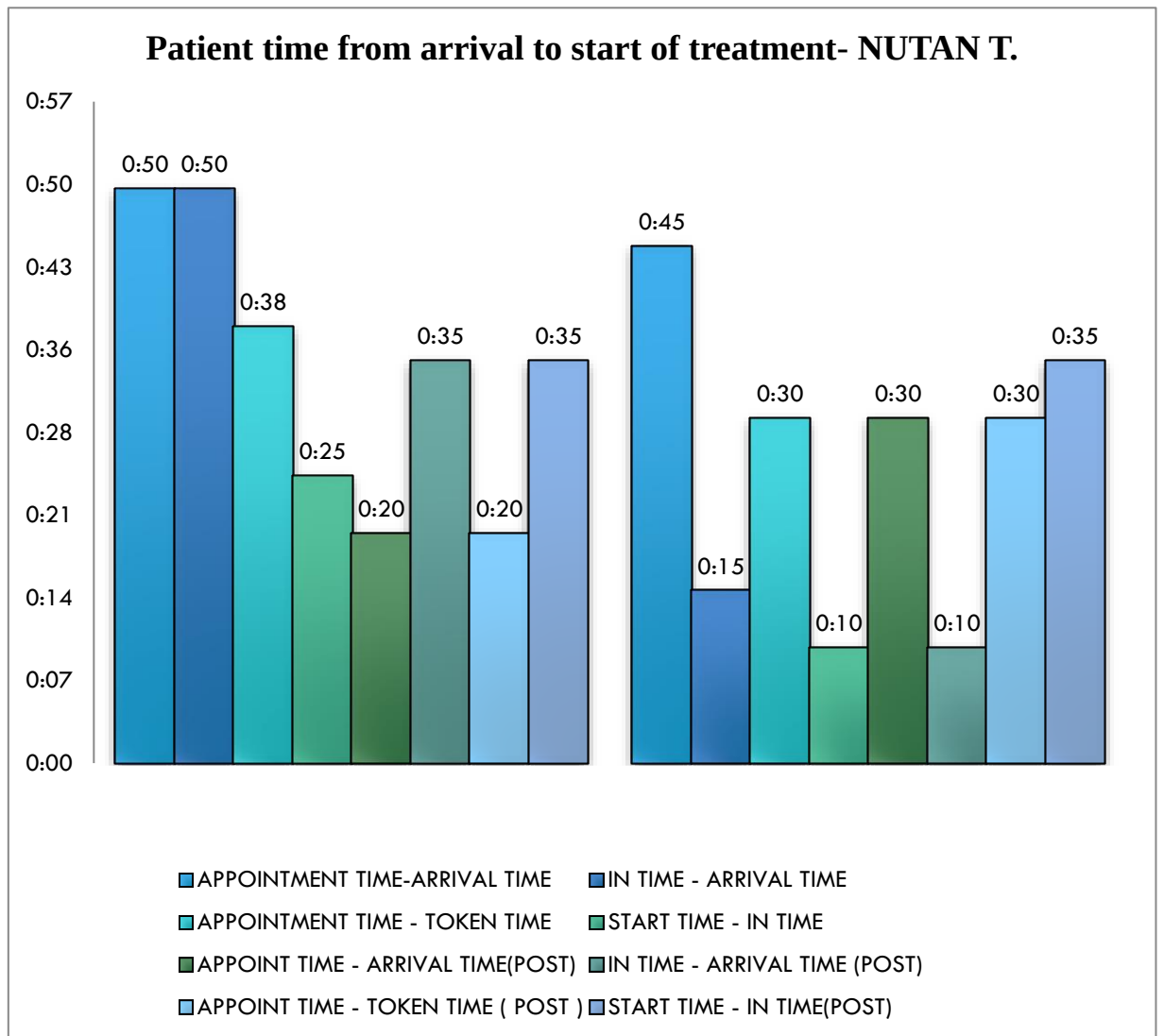


FIGURE 4.7: PATIENT TIME FROM ARRIVAL TO START OF TREATMENT

INFERENCE:

This figure depicts appointment time to arrival time, in time to arrival time, appointment time to token time, and start time to end time of patient. Patient arrival time to in time (for treatment) often is the main cause of dissatisfaction for patients. After the change in schedule of appoint time, and patient education the in time to arrival time has reduced from 55 minutes to 35 minutes for this particular patient, which shows that patient education and change of schedule of patients has reduced time significantly [fig.4.7]

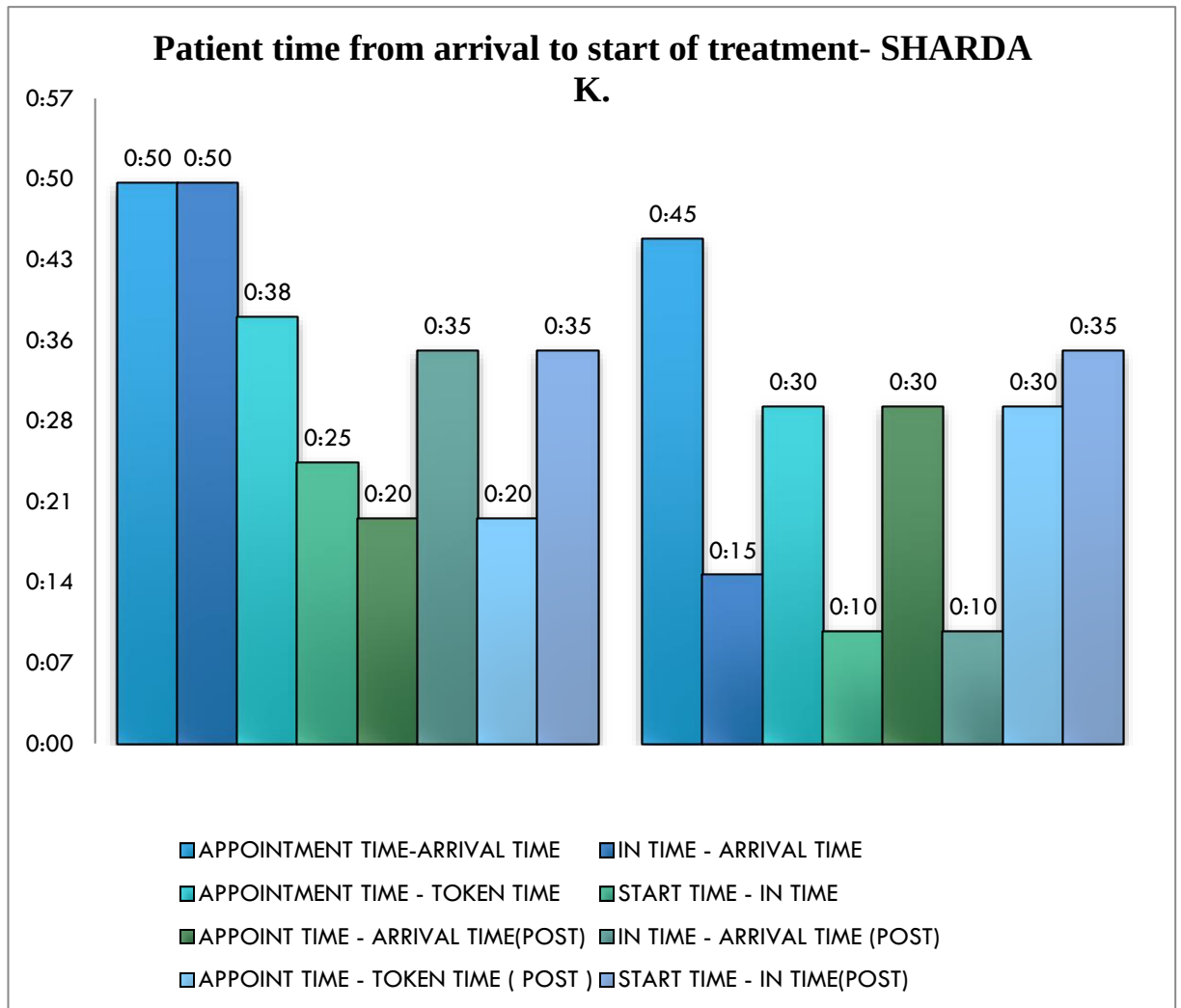
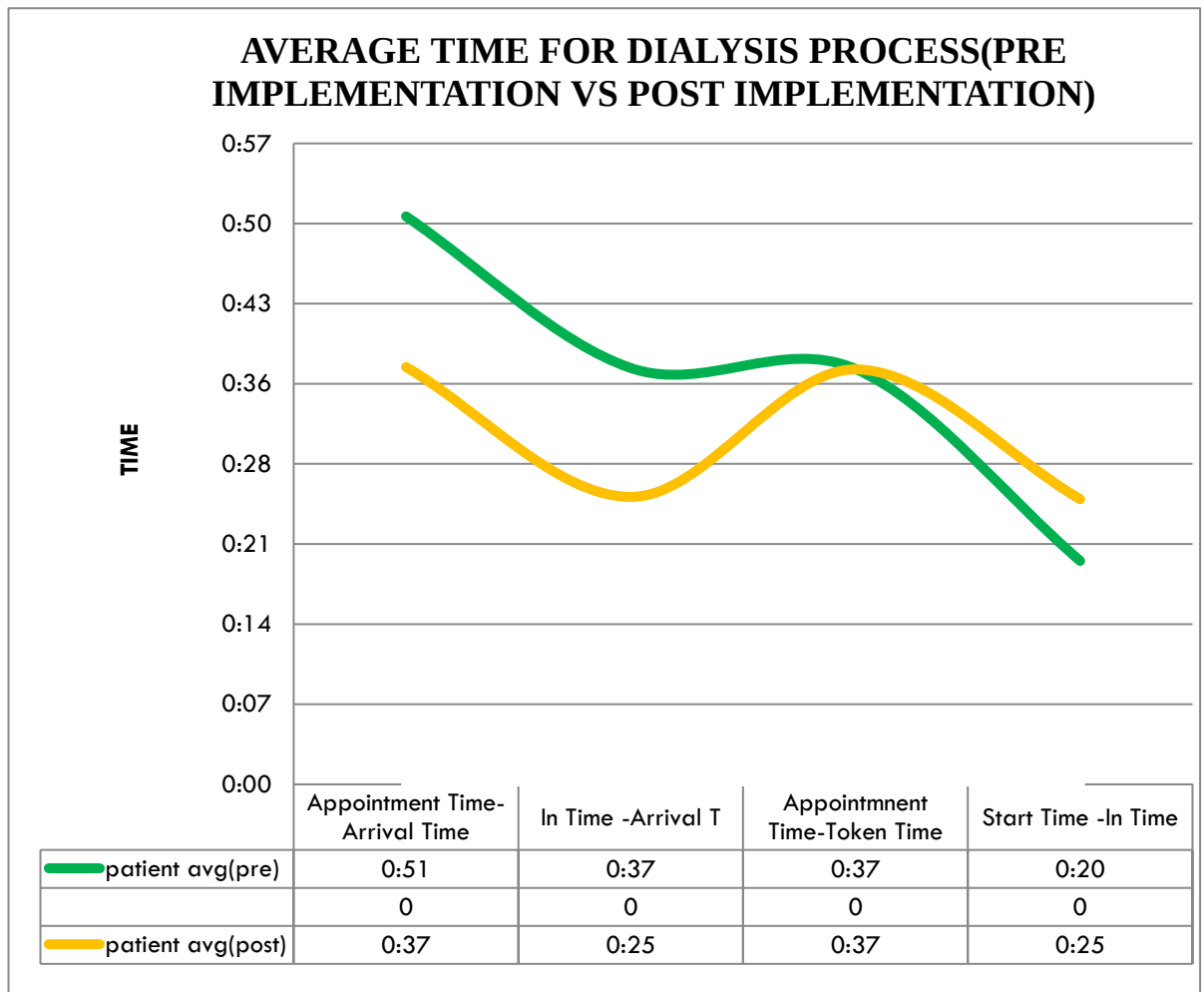


FIGURE 4.8: PATIENT TIME FROM ARRIVAL TO START OF TREATMENT

INFERENCE:

This figure depicts appointment time to arrival time, in time to arrival time, appointment time to token time, and start time to end time of patient. Patient arrival time to in time (for treatment) often is the main cause of dissatisfaction for patients. After the change in schedule of appoint time, and patient education the in time to arrival time has reduced from 45 minutes to 35 minutes for this particular patient, which shows that patient education and change schedule of patients has reduced time significantly [fig.4.8]



**FIGURE 4.9: AVERAGE TIME FOR DIALYSIS PROCESS
(PRE-IMPLEMENTATION VS POST- IMPLEMENTATION)**

INFERENCE:

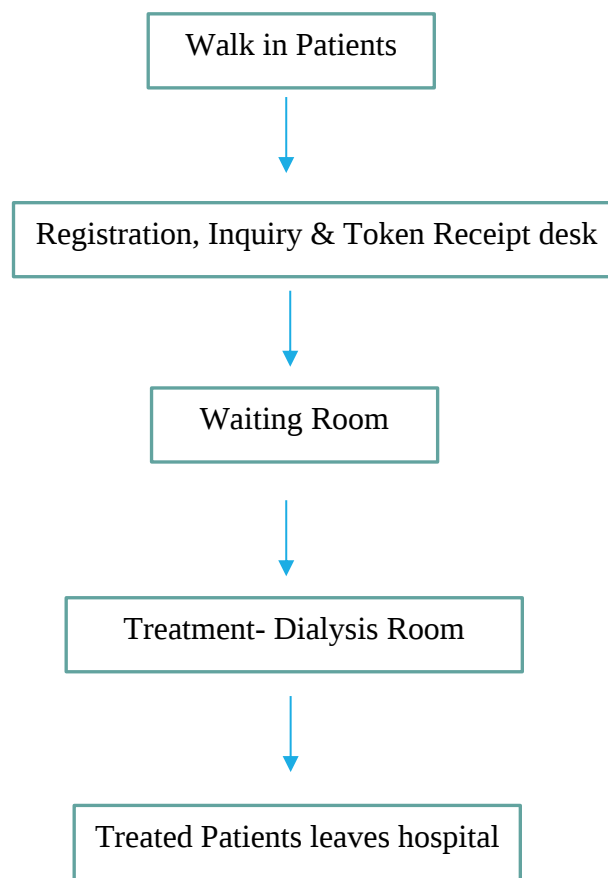
The figure given above gives average times of patients which were filtered. The major factor, which was the cause for dissatisfaction of patients, which is from arrival to in time, shows a significant improvement. Before changing the scheduling of patients, the in-time to arrival time was 35 minutes after the change it has come down to 25 minutes. That means within 30 minutes of patient arriving he is in for treatment in the department. [fig.4.9]

5. DISCUSSION –

Getting dialysis does take a lot of time. It is observed that dialysis is a routine many patients do not follow strictly due to the number of hours and number of times the person has to visit the dialysis department. That is why the patient education is very necessary for patients undergoing dialysis treatment. They have lack of conviction maintaining regime. They often skip alternate sessions due to the mental stress of travel for the treatment.

In the department of the multi-specialty hospital, talking to the patient revealed the staffs were all well equipped with soft skills, which was a positive for the patients. The staffs used to explain to them the type of treatment and long-term effects of the treatment. The technicians and nurses would often take time and encourage the patient to maintain the treatment regime.

Figure 6.1. Flow Chart of Outpatient visiting a for dialysis in Hospital



The workflow followed by the patients on normal OPD days for getting dialysis was observed in detail to look for a gap. Firstly, the walk-in patients coming for dialysis treatment receive a slot for the appointment time. After reaching to the hospital, they go directly to the registration desk, there they inquire about the services and can obtain a token after completing payment. Later on, patients wait for their turn in the waiting area for about an hour on average, then when called, goes inside the Dialysis Room, where it takes 4-5 hours for treatment.

It was highlighted in a study on Building Dialysis Workflows into EMRs done in 2013 by Yu B and Wijesekera D. that when the workflow system is properly enforced and that is in compliance with the local and national standards and policies like NABH standards, SOPs can improve the quality of care provided to dialysis patients, also provide flexibility that caregivers need to continue treatment

The whole workflow times observed in the hospital is divided in 4, that includes;

Appointment time that is given to the patients by the hospital staff based on the availability of services or doctors.

Arrival Time is when the patient arrives at the hospital for the treatment.

Token time is the time when the token is obtained from the registration desk.

In-time refers to the time of entering in the dialysis room for treatment.

The schedule of treatment which was followed in the department was first come first serve based on the appointment time slot. This type of scheduling used to be irregular and hence the patients used to get in for the treatment after an hour of arriving to the department. Also, it was observed that the gap between patient's arrival time and the treatment time is wide, that is the main cause behind increasing the overall waiting time. This would further cause the patient to lose confidence and could lead to dissatisfaction.

So, with the aim to reduce the gap between arrival time and in-time, it was decided to introduce an appointment system for patient scheduling in which the treatment schedule would be changed from first come basis to appointment. This seemed to be a difficult task as all the patients needed to be educated first. The relatives and the patients were given through instructions to follow time and the importance of coming on time.

The in-time to arrival-time observed pre implementation was an average of 37 minutes, which meant the patient had to wait for 37 minutes to get in for the treatment. The same

time post implementation of schedule had come down to 25 minutes, which inferred that the patient education and appointment system had an effect on the waiting time of patient.

The appointment time to arrival time was recorded to be 51 minutes pre implementation of schedule, as it was first come first serve basis the appointment was given at the time arrival. The time taken was observed to be more as many patients used to be in line waiting for their treatment. Post implementation the time had come down to 37 minutes.

Based on the observations, it was noted that there was decrease in waiting time of the patient till the time they entered for treatment. The patient waiting time had reduced and which encouraged the patients to take a positive approach towards treatment. Resembling results had been observed in a 2008 study by Chuang HF, Chan SJ, Lin YC on their project to reduce waiting time during peritoneal dialysis visit's, in which computerized appointment system was implemented which resulted in shortened patient waiting time and improved satisfaction score.

However, another study by Nappo RW, Ross EA, explained how queuing theorem can be adopted to optimise haemodialysis scheduling that can improve facility efficiency, minimises the long wait time, which can be a big dissatisfier among patients, and is associated with improved URRs with more patients reaching target clearance thresholds.

The change in scheduling time from first come first serve basis to appointment basis has brought down waiting time considerably. The patients were aware of coming on time and maintaining proper schedule of treatment and patient were observed to be visually satisfied. Similar observation has been found by a 2018 study done in Iranian hospitals by Dr. Iqbal MZ, Dr. Aamir M to determine the factor that can influence patients' satisfaction that the management and organizational issues, followed by issues connected with physicians, nurses and employees and patients expect the officials of hospitals to reduce waiting time for their services.

Confirmation on this aspect can be done by a recent 2020 study by Ke Li Yew on Impact of Wait Times, Perception of Care and Environment on Patient Satisfaction at Infusion Centers and Dialysis Centers, concluded that one of the reasons for shorter wait times and perceived wait times at the dialysis centers is due to having scheduled appointments. This further suggests that having appointments might aid in the management of patient flow for centers. Wait times can be reduced significantly with scheduled appointments to improve patient satisfaction and there is a significant impact of Technical Skills, Interpersonal Skills & Environment on Patient Satisfaction

Another 2015 German study by Matthias Keil on ‘Workflow optimization and process automation in dialysis wards by introducing a treatment monitoring system’ describes the benefits of introducing various systems like patient monitoring system or appointment system can significantly reduce the manual work and improve the documentation quality, that in turn reduce the overall treatment time of dialysis, hence patient satisfaction.

The staff technicians and nurses had been cordial and courteous throughout the process. They share a good rapport with the patients. This had positive effect on the patient as they responded positively to the new schedule system. In the dialysis department, the patients are vulnerable hence the dialysis staff must always talk to the patient giving them detailed instructions. This was seen to be positive in the respective department of the multispecialty hospital.

As stated in a 2019 cross-sectional descriptive study done by Door ZH, Dr. Mukhtar HF in a cross-sectional descriptive study on ‘The Satisfaction of Patients on Maintenance Hemodialysis Concerning the Provided Nursing Care in Hemodialysis Units’ that the willingness and flexibility showed by nurses and staff in meeting patient’s needs improves patient satisfaction.

Similarly, in the hospital, as a result of flexibility showed by the staff, the relationship between the staff and patients were on a good note. This made the transition from earlier form of scheduling to the new appointment-based scheduling system very smooth. The patients and relatives used to abide by the instructions the staff were giving.

This impacted the morale and motivation of patients to come on time and come at the appointed time. This in turn had an effect on turnover of the beds, that can have significantly detrimental impact on hospitals, patients, and healthcare staff. Thus, improving the healthcare services.

6. CONCLUSION-

The patients coming to the dialysis department are vulnerable and their time is precious and they have to spend long waiting hours from arrival to entry into the dialysis department was a major factor of dissatisfaction of for the patients as the service was given on a first come first serve basis.

After the continuous observation of the patient workflow in the department, causing problem was pointed out and the new schedule was set according to time given by technician and nurses and the relationship between the staff and patients was noted to be on a positive side. This made the transition from earlier form of scheduling to the new appointment-based scheduling system smooth with challenges faced only to educate and aware the patients. The importance of scheduling of treatments were explained to the patients by the nurses and technicians, this caused the patients to follow the treatment on their own. In the process to do so, staff has faced few minor challenges while educating patients and their relatives such as patients' resistance to understand which eventually overcame by the determination of the staff.

As the week progressed the patients started coming half an hour before their dialysis schedule. The patients were visually satisfied that within half an hour of coming to the hospital their dialysis treatment was started. Waiting time of the patient of the had reduced, which encouraged the patients to take a positive approach towards treatment.

So, it is concluded that introducing an appointment system for patient scheduling reduces the length of waiting time for the patients coming for haemodialysis at the hospital and the appointment and arrival time is strongest independent modifiable risk factor for waiting time.

Dialysis being a continuous care system as opposed to a one-time activity, the most critical factor for offering enhanced patient care is patient satisfaction by improving their overall experience and by managing subsequent patient visits.

7. RECOMMENDATIONS

1. The department will have to adjust to the new computerized appointment scheduling system of the patients. The time taken from arrival to entry will come down further.

2. There could be better planned tasks and help from housekeeping department who are formally educated. These housekeeping staff could be trained to clean and prepare the dialyzer for the next patients.
3. There would be no addition of staff, but the existing internship candidates could assist the technician in priming the dialyzer. This could help with the quality of dialyzer and could increase durability of dialyzer.
4. Additionally, the workflow of the medical and paramedical should be concentrated to reduce errors.
5. The area of preparation of dialyzer seemed to be of old model, since the department has been running for a long time. Hence there is a requirement to renovate and upgrade the process of preparation of dialyzer in the department. This would increase the quality of dialysis being done in the department.
6. The patient attendant waits in the waiting area without any hassle, providing a proper lounge with facilities for the attendants could boost the morale of the patients.
7. Increasing flexibility within a system is vital to improving capacity and efficiency.

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ANNEXURE

TABULATION:

The data was collected and tabulated in excel. Since the analysis included comparison of pre and post schedule times collected. Out of the data of all the patients, the data of 8 patients had been recurring for 2 weeks. Hence the data comprises of compiled list of 8 patients and the times note

TABLE 1: 0141-2791431-718

	PRE-INTERVENTION				POST-INTERVENTION			
Patient name	Appointment Time- Arrival Time	Appointment Time-Token Time	In Time -Arrival Time	Start Time -In Time	Appointment Time-Arrival Time	Appointment Time-Token Time	In Time-Arrival Time	Start Time-In Time
Pratul Rai	1:55	1:40	0:45	0:40	0:10	0:10	0:40	0:10
	-0.01	-0.021	-0.006	0:00	0	0	0	0
Anjana Sharma	0:30	0:15	1:00	0:30	0:15	0:15	0:30	0:25
	0:00	-0.01	0:30	0:40	0:00	0:00	0:00	0:00
Karthik	0:05	-0.003	0:35	0:20	0:30	0:30	0:20	0:40
	-0.003	-0.014	0:25	0:20	1:10	1:10	0:50	0:25
Damodar	0:45	0:30	0:15	0:20	0:30	0:30	0:00	0:00
	0:25	0:10	0:45	0:20	0:40	0:35	0:35	0:30

Jagdeesh M.	2:05	1:55	1:05	0:20	1:15	1:15	0:40	1:05
	0:00	0:00	0:00	0:00	0:30	0:30	0:55	0:35
Kamla	1:45	1:30	1:00	0:20	0:25	0:25	0:15	0:55
	1:10	0:55	0:50	-0.486	1:45	1:45	1:10	0:25
Nutan T.	1:00	0:45	0:30	0:20	1:00	1:00	0:20	0:20
	0:45	0:30	0:35	0:10	0	0	0	0
Sharda K.	1:15	1:00	0:45	0:30	1:00	1:00	0:05	0:15
	1:00	0:45	0:45	0:30	0:25	0:25	0:00	0:10
Manorama	0:50	0:35	0:38	0:27	1:00	1:00	0:30	0:30
	1:45	1:30	0:55	0:15	1:00	1:00	0:40	0:45
Prakash T	1:25	1:10	0:45	0:30	1:00	1:00	0:30	0:25
	0:55	0:40	0:55	0:20	0:45	0:45	0:50	0:20
Sita	0:55	0:38	0:55	0:25	0:20	0:20	0:35	0:35
	0:40	0:30	0:10	0:10	0:30	0:30	0:10	0:35
Ranu	0:50	0:38	0:50	0:25	0:20	0:20	0:35	0:35
	0:45	0:30	0:15	0:10	0:30	0:30	0:10	0:35
