Study on Turnaround Time of Patient in Emergency Department

By

Ayushka Chopra

Dissertation submitted for the partial fulfillment of the

MBA Hospital and Health Management

Academic year, 2015-2017

The IIHMR University, Jaipur

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INSTITUTE OF HEALTH
MANAGEMENT RESEARCH
(WHO Collaborating Centre for District Health System Based on Primary Health Care)

IIHMR UNIVERSITY

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Ayushka Chopra, a student of MBA Hospital and Health Management from The IIHMR University, Jaipur has undergone internship training at Max Superspeciality Hospital, Vaishali from 6th February to 5th May, 2017.

The Candidate has successfully carried out the study designated to him during internship training and his approach to the study has been sincere, scientific and analytical.

The Internship is in fulfillment of the course requirements.

I wish him all success in all his future endeavors.

Col. (Dr.) Ashok Kaushik

Dean, Academics and Student Affairs

The IIHMR University, Jaipur

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Date: 8th May'2017

TO WHOMSOEVER IT MAY CONCERN

The certificate is awarded to **Dr. Ayushka Chopra** in recognition of having successfully completed her Internship in the department of **Medical Administration** and has successfully completed her Project on **Study of turnaround time (TAT) of patient in emergency** From **6th February'2017 to 5th May 2017** at **Max Super Speciality Hospital, Vaishali.**

She comes across as a committed, sincere & diligent person who has a strong drive and zeal for learning

We wish her all the best for future endeavors.

Training & Development

Dr. Prashant Vashistha
MBBS (MAMC), MBA HCA (FMS), Six Sigma BB
Addl. Medical Superintendent
Max Super Speciality Hospital
W-3, Sec-1, Vaishali, GZB-201012

Head-Human Resources

NABH ACCREDITED

THE IIHMR UNIVERSITY, JAIPUR

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled "**A Study on Turnaround time of patients in Emergency Department**" and submitted by **Ayushka Chopra** Enrollment No. **IIHMR-U/01/2015-17/0266** under the supervision of **Col. (Dr) Ashok Kaushik** for award of MBA in Hospital and Health Management of the University carried out during the period from **6th February 2017 to 5th May 2017** embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other institute or other similar institution of higher learning.

Ayushka

Signature

THE IIHMR UNIVERSITY, JAIPUR

CERTIFICATE BY SCHOLAR

This is to certify that all ethical issues have been considered while collecting data for my dissertation titled "**A Study on Turnaround time of patients in Emergency Department at Max Superspeciality Hospital, Vaishali.**"

Signature of student

PREFACE

The conceptual knowledge acquired by the MBA students is best manifested in the projects. As a part of curriculum, every student studying MBA has to undertake a dissertation report on a particular subject assigned to him/her.

Accordingly, I have been assigned the project work on **"**Turnaround time of patients at Emergency Department**"** at Max Super Speciality hospital, Vaishali. The present project gives a perfect vent to my understanding of one the important aspect of the organization that is patient satisfaction related to their length of stay in hospital .

The dissertation report is entitled. **"A Study on Turnaround Time of patients at Emergency Department"**

The present study was undertaken to understand the factors that cause a delay in the turnaround time of patients.

I have tried to put my best effort to complete the task on the basis of the skills that I have achieved during my studies in the institute. I also hope this report will be beneficial for my next batches and for those who will be related to this topic.

Acknowledgements

On the completion of this project, I would like to extend my sincere and heartfelt obligation towards all the people both in my college as well as my working organization who helped me in this endeavour. Without their help, their active guidance, cooperation and encouragement, it would have been very difficult to complete the project and learn new things from them.

I am extremely thankful to my mentor **Dr.PrashantVashistha**, Additional Medical Superintendent at Max Super Speciality Hospital, Vaishali. I thank him for being my greatest support and helping me to climb up the corporate ladder step by step.

My special thanks to **Dr.Mohita Chandra**, Medical Superintendent at Max Super Speciality Hospital, Vaishali to guide me and whose stimulating suggestions and encouragement helped me to move forward with my project.

I am obliged to Max Super Speciality Hospital, Vaishalifor providing me the opportunity.

I am extremely thankful and pay my extreme gratitude to my faculty guide, **Col.(Dr)Ashok Kaushik (Professor and Dean, IIMHR University)** for his valuable guidance and support in completion of this project.

I would like to extend my gratitude and appreciation to my college authorities and staff.

I also acknowledge with a deep sense of reverence, my gratitude towards my parents, family and friends who supported me morally in accomplishing the task.

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Abbreviations:

A & E	Accident and Emergency
CGHS	Central Government Health Scheme
ED	Emergency Department
EMO	Emergency Medical Officer
ER	Emergency Room
GDA	General Duty Assistant
HIS	Hospital Information System
ICU	Intensive Care Unit
PSU	Public Sector Unit
TAT	Turnaround Time
TPA	Third Party Administrator

Abstract

Introduction

Turnaround Time (TAT) for Emergency department is taken as the time from patient arrival to either bed allotment or discharge as reflected in the system.

Walrath JM, Maguire JM (2004) opined that "In the department examined it is defined as the time from patient arrival to either discharge or hospitalization. The measurement of turnaround time is a helpful variable of efficacy which is feasible in most emergency departments. Measuring turnaround times may have two major goals: improving the medical care delivered within reasonable time and taking care of for patients' satisfaction."

According to Baker B, Rochon J. (1989), "Turnaround time is an important parameter that strongly influences patients and staff satisfaction in the emergency department and there are early reports considering this important issue."

According to Kar, Datta and Ahmed (2015) "Turnaround Time (TAT) of patients shifted to ICU from Emergency department is of outmost importance as delay in transfer is associated with increasing mortality as shown in different studies. The longer the patient stays in ER the more likely their care could be compromised."

Long length of stay in ER can lead to decreased patient satisfaction, revenue loss for the hospital, compromised care for patients with acute illness and employee dissatisfaction.

Objectives:

This study was undertaken with the following objectives:

- To study the process flow of emergency department
- To determine the TAT of patients at ER.
- To perform a gap analysis of the process.

Research Methodology:

A prospective observational study was carried out during the period of March 24, 2017 to April 24, 2017 at a Tertiary Care hospital in Delhi NCR. The data collected was both primary and secondary. Primary data was collected for the patients arriving at the Emergency Department, by direct observation while the secondary data was collected with the form the Hospital Information system and the ER register. The sample considered was 172 based on convenience sampling. The study was carried out by recording the findings in a self-structured ER list. Data Analysis was done through advanced Microsoft Excel functions.

Result:

28% of the cases (i.e. 48 cases) recorded a TAT of more than 4 hours with an average TAT of 6 hours i.e. an average delay of 2 hours. Of all the delayed cases, 37% were cash & TPA patients while 67% of patients belonged to PSU. The major factors identified for an increase in Turnaround Time were non availability of beds in 81% of the cases, delay from investigations in 25% of the cases and communication failure between nursing and the front office staff in 19% of the cases. Delays in patient transfer were caused due to non-availability of GDAs in 43% of the cases and non-availability of nurses in 28% of the cases while housekeeping related issues and lack of coordination between nursing and admission staff was observed in 10% and 12% of cases respectively.

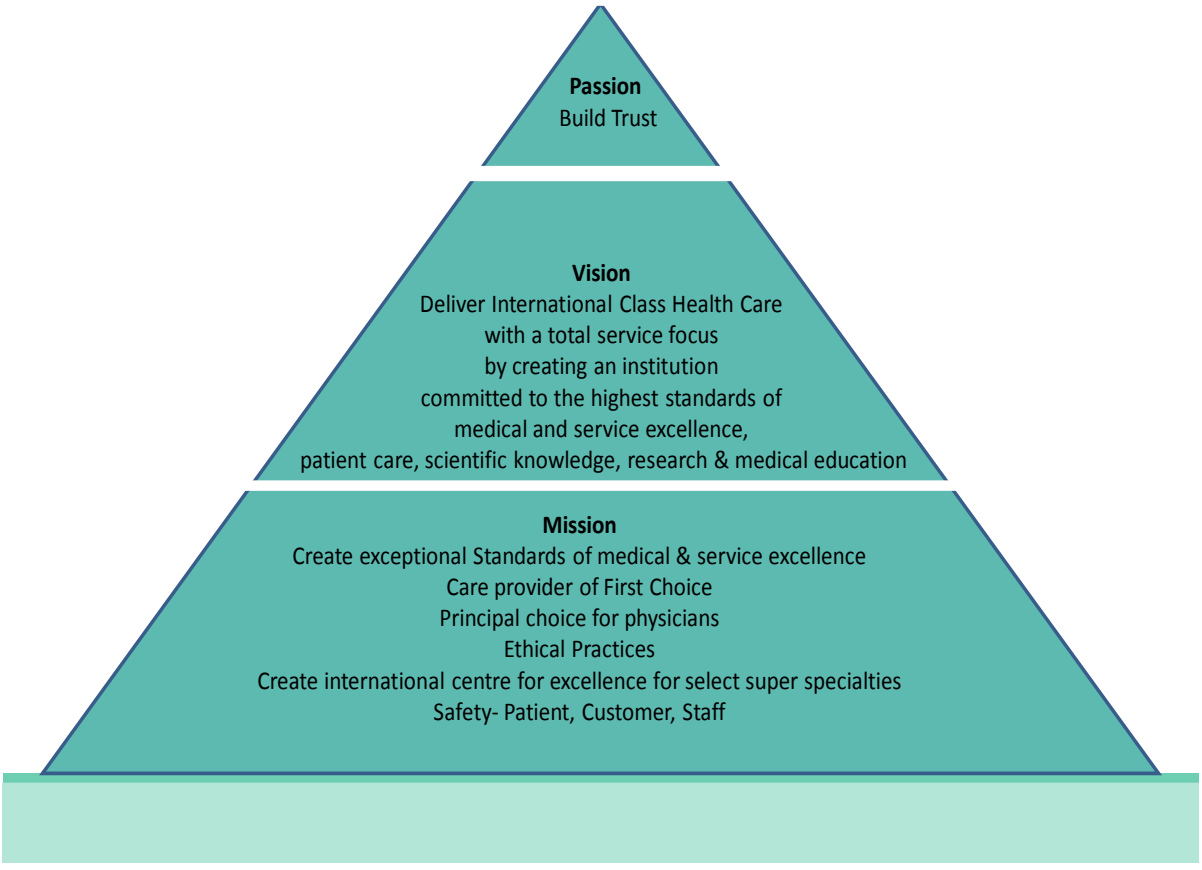
Conclusion

Causes that delayed the Turnaround time of patients in ER were non- availability of beds, delay in investigations and communication failure between nursing and the front office staff. While other reasons like GDA, nursing and housekeeping related issues further delayed the shifting of patient from ER, leading to an increase in the length of stay for patients. Addressing these factors would decrease the TAT to an optimum level.

INTRODUCTION:

Max Super Speciality Hospital is a distinguished 350-bedded healthcare service provider offering Specialty Treatments and Tertiary Care facilities to its national and international patients. Built on 3.5 acres of land, this hospital is conveniently situated on NH24, and has been designed to exude a curative ambiance for all. The best in class infrastructure and technologically advanced equipment conjoined with a massive clinical talent pool ensures that the patients receive safe and compassionate patient care. The management team of the hospital carries an unrelenting zeal of developing an affordable and efficient health care system. Driven by its mission of providing innovative, efficient, high quality, and cost-effective health care solutions, the team at this hospital constantly endeavors to leverage its skill and expertise to the maximum. The dedicated team of seasoned specialists, accomplished surgeons, efficient nursing staff, and knowledgeable technicians offer the patients with a clinical experience which is at par with excellence.

Mission Vision Statement



The hospital caters to relatively all the specialties, such as:

- Cardiology
- Dermatology
- Gastroenterology
- Gynaecology
- Infertility
- Neuro Surgery
- Rheumatology
- Orthopedics
- Pulmonology
- Paediatrics
- Internal Medicine
- Oncology

Apart from offering Surgical, Preventive and Curative Services for all specialties, the establishment also offers:

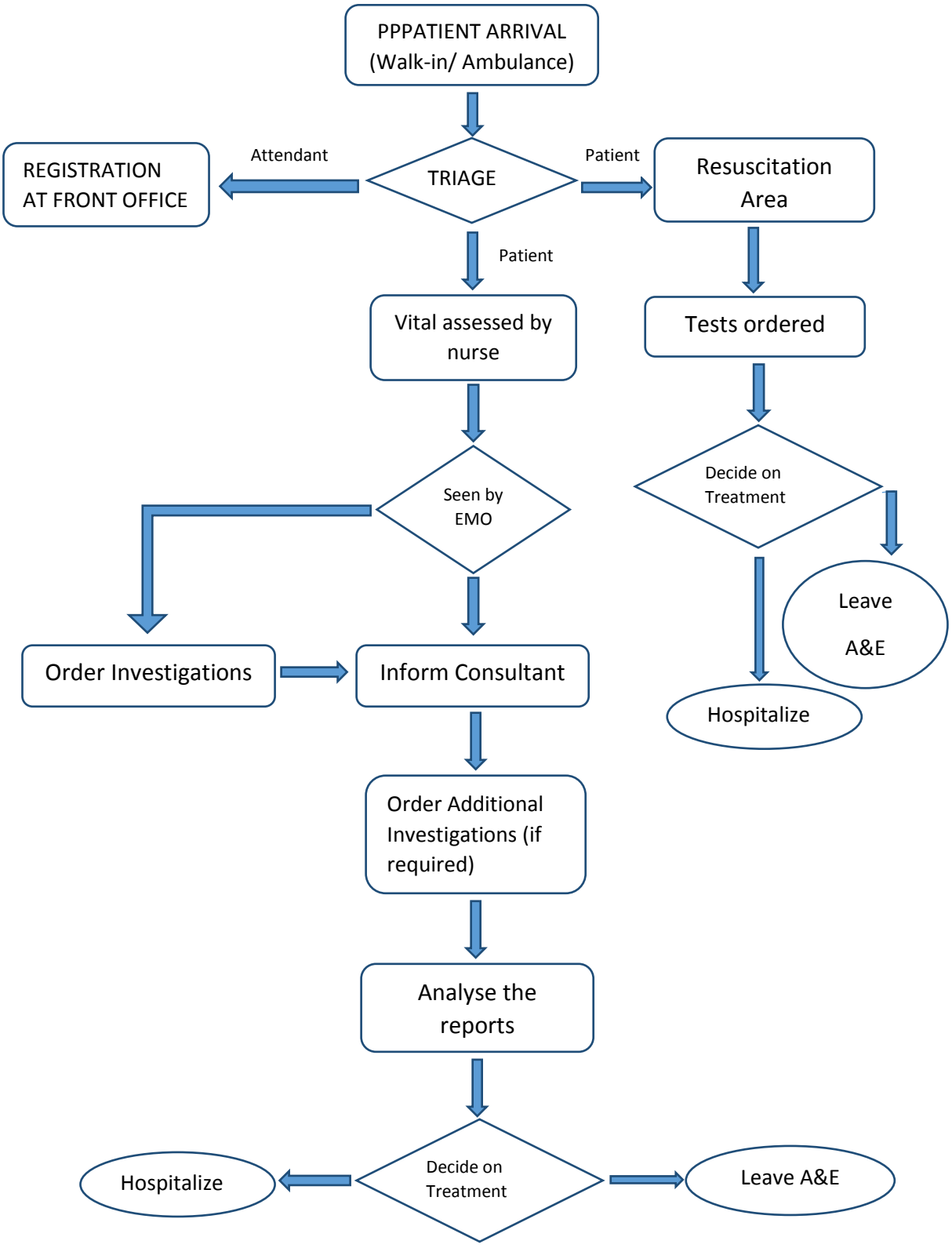
- Emergency & Trauma Services
- Critical Care Services
- Ambulance Services
- Laboratory Services
- Diagnostic Services
- Homeopathy Treatment
- Nuclear Medicine Services.

The hospital caters to its international patients by providing a wide array of services, such as, Travel Assistance, Language Services, and many more. Other facilities and amenities provided by the hospital include Blood Bank, Pharmacy, TPA Services, and Cafeteria.

The present study focuses on the Turnaround time of the emergency department at Max Super Speciality Hospital, Vaishali. Emergency department of a hospital responsible for the provision of medical and surgical care to patients arriving at the hospital in need of immediate care; either by their own means or that of an ambulance. The emergency department is also called the emergency room (ER), accident and emergency department (A&E) or casualty department. The department operates 24 hours a day with the staff well equipped to provide emergency care to the needy.It’s a 14 bedded facility

with 12 beds colour coded according to triage and 2 beds placed in the resuscitation area.

Process flow of Emergency Department:



Triage

To cater to the needs of all patients entering ER, prioritization of cases based on clinical needs is an important operational aspect of the department. This process is known as triage.

For those responsible for the triage of patients arriving in the emergency department, the purpose of triage is to determine to which predesignated patient care area the patient should be sent.The locations to which the patients are 'triaged' establishes priorities for care. ("Emergency Department", (2006), retrieved from http://www.emergencymedicine.in/Moreabout/Edepartment.htm)

The advanced triage system involves a color-coding scheme using red, yellow, green, white, and black tags:

- Red tags- (immediate) are used to label those who cannot survive without immediate treatment but who have a chance of survival.
- Yellow tags- (observation) for those who require observation (and possible later re-triage). Their condition is stable for the moment and, they are not in immediate danger of death. These victims will still need hospital care and would be treated immediately under normal circumstances.
- Green tags- (wait) are reserved for the "walking wounded" who will need medical care at some point, after more critical injuries have been treated.
- White tags - (dismiss) are given to those with minor injuries for whom a doctor's care is not required.
- Black tags- (expectant) are used for the deceased and for those whose injuries are so extensive that they will not be able to survive given the care that is available.

(Stoppler C M (2014), *Medical Triage: Code Tags and Triage Terminology.* Retrieved from http://www.medicinenet.com/script/main/art.asp?articlekey=79529)

Patients who require immediate medical care are taken to resuscitation areas, while the dead are moved directly to the morgue.

Resuscitation Area

"This area is dedicated to the immediate care of patients and victims in cardiac arrest, airway, breathing and circulation compromise. The 'Resus' area consists of two or more

resuscitation beds (sometimes up to 12) with all resuscitative equipment (monitors, defibrillators, airway, intubation & surgical equipment) available at an arm's distance including paediatric resuscitation kits.

A patient may be shifted to the Resus area from outside or from an area within the hospital or emergency department itself." ("Emergency Department", (2006), retrieved from http://www.emergencymedicine.in/Moreabout/Edepartment.htm)

Minor Procedure Room

"Procedures like washing, dressing & suturing of wounds, reduction & splinting of fractures & dislocations, and other minor surgical procedures are done here." ("Emergency Department", (2006), retrieved from http://www.emergencymedicine.in/Moreabout/Edepartment.htm)

Turnaround Time (TAT) for Emergency department is taken as the time from patient arrival to either bed allotment or discharge as reflected in the system.

Walrath JM, Maguire JM (2004) opined that "In the department examined it is defined as the time from patient arrival to either discharge or hospitalization. The measurement of turnaround time is a helpful variable of efficacy which is feasible in most emergency departments. Measuring turnaround times may have two major goals: improving the medical care delivered within reasonable time and taking care of for patients' satisfaction."

One of the challenging aspects of the emergency department (ED) environment is meeting a patients expectations. A study by Brendan T Parker and Catherine Marco (2013) has identified several factors associated with ED patient satisfaction. "Lengthy wait times have shown to be associated with dissatisfaction with ED care. Understanding that patients are inaccurate at their estimation of wait time, which could lead to lower satisfaction, provides administrators possible points of intervention to help improve accuracy of estimation and possibly satisfaction with the ED.", was stated in the study.

According to Baker B, Rochon J. (1989), "Turnaround time is an important parameter that strongly influences patients and staff satisfaction in the emergency department and there are early reports considering this important issue."

According to Kar, Datta and Ahmed (2015) "Turnaround Time (TAT) of patients shifted to ICU from Emergency department is of outmost importance as delay in transfer is associated with increasing mortality as shown in different studies. The longer the patient stays in ER the more likely their care could be compromised."
Long length of stay in ER can lead to decreased patient satisfaction, revenue loss for the hospital, compromised care for patients with acute illness and employee dissatisfaction.

AIM: To study the Turnaround time (TAT) of patients in Emergency Department of Max Super Speciality Hospital, Vaishali.

OBJECTIVES:

- To study the process flow of emergency department
- To determine the TAT of patients at ER.
- To perform a gap analysis of the process and give recommendations.

REVIEW OF LITERATURE

"Long wait times and an inefficient admissions process are problems that busy emergency departments often face." Claimed Robert Wood Johnson Foundation(2008) in their study titled "Reducing Turnaround Time for Fast Track Emergency Department (ED) Patients"

Similarly, ClinLeadershManag Rev (2004) reported that "The emergency departments (ED) at many medical centers are experiencing increased crowding and prolonged ED patient length of stay. During periods of heavy patient volume, the ED may go on divert status and be unable to care for new patients except for life-threatening illness."

Guttman A et al. (2011) in their study claimed that "Emergency department (ED) crowding and long waiting times are associated with numerous adverse consequences, including a higher risk of mortality,subsequent hospital admission and lower levels of patient satisfaction."

In addition to that, Huang, Thind, Dreyer, &Zaric (2010) report that approximately 11.6% of patients experienced admission delay and that admission delay was associated with 12.4% longer length of stay in the hospital (Huang et al., 2010). The delays of

transfer to the appropriate care area are associated with increased length of hospital stay and improving patient flow through the emergency department may reduce hospital costs and improve quality of care (Huang et al., 2010).

Lab and radiological investigations delay has also proved to have a direct impact on ER TAT. Stating this in their study, Johnson KD, Winkelman C. (2011) and Richardson DB (2006) opined that "Hospitals are looking for ways to reduce emergency department (ED) crowding and length of stay (LOS), both of which are associated with higher rates of preventable medical errors and poor patient outcomes, including increased mortality."

"Laboratory test results are crucial to diagnostic workup and patient management decisions and thus a potentially important contributor to ED patient flow. Turnaround time (TAT) for laboratory results is frequently used as a key performance indicator of laboratory service performance."Hawkins RC (2007).

A simulation study by Storrow et al. in 2008 suggested that decreased TAT could improve ED efficiency and reduce ED LOS.

In addition to this, in 2005, Holland et al.found that a reduction in tests with extremely long TATs was associated with a reduction in average ED LOS.

A study by Li L, Georgiou A, Vecellio E et al. (2015) stated that "The processing time for any hospital service, such as the time a patient remains in an ED bed while awaiting the results of laboratory testing, is associated with time that hospital resources (e.g., bed space, medical equipment, physician's time) are not available to other patients, such as those in the ED waiting room. In this way, laboratory TAT can indirectly influence all aspects of the patient's LOS in the ED, including the interval between arrival and triage and between triage and being seen by a physician. However, laboratory TAT can only directly influence the duration of an individual patient's stay in the ED once a laboratory test has been ordered." Their fingings suggested that "On an average, for every additional 30-minute increment in test TAT there was a 17-minute increase in median ED LOS. These findings provide an empirical confirmation of a simulation study undertaken by Storrow et al.,[**6**] which estimated the effect of decreasing TAT on ED efficiency and showed that a 60-minute reduction in TAT (from 120 to 60 minutes) was estimated to produce a 30-minute decrease in ED LOS (from 166 to 136 minutes)."

Alison Day and Carol Oldroyd (2012) in their study titled "Ättempting to reduce the maximum Emergency waiting time to four hours in England: Was the initiative successful?" stated that "Long wait times in the emergency department have been recognised as a concern throughout the worldas demand on services increases. A prolonged ED wait time reduces quality of care and can adversely affect outcome for patients with serious illness. In addition extended wait times and ED crowding contribute to patient dissatisfaction and staff frustration. In respone to these issues, The Department of health, England proposed, as a part of National Health Service (NHS) Plan, a maximum waiting time of 4 hours to admission, transfer or discharge."

As Liew D, Kennedy MP (2003) opined "Prolonged ED wait time and length of visit reduce quality of care and increase adverse events for patients with serious illnesses." To support the statement, Diercks DB, Roe MT, Chen AY, et al (2007) in their study cited that "For example, patients presenting with non-ST-elevation myocardial infarction (MI) who have an ED stay of more than 8 hours are more likely to have recurrent in-hospital MI than patients with an average ED stay."

Bukhari H, Albazli K et al. (2014) found a mean LOS of 3:02 hour (SD = 5:03 hour). They further claimed that"23.4% of visits to ED had a delay in LOS more than four hours. Prolonged LOS was associated with prolonged laboratory and consultation time, patient admission to observation or trauma areas, critical care management patients, and prolonged final decision time to time of physical response to the final decision."

"Prolonged wait time and length of visit also decrease patient satisfaction and increase the number of patients who leave before being seen." Rodi SW, GrauMV(2006) and Fernandes CM, Price A, Christenson JM (1997) in their study.

"Apart from Turnaround Time, other factors that affect ED service quality are the delays (Halland Press, 1996 and Fernandes et al. 1994) that patients experience while being treated.These include waiting for resources such as nurses, physicians, experts and logisticspersonnel, waiting for a bed, waiting for test results, etc."

Similarly, a study by Mortimore A, Cooper S (2007) claims that "The 4-hour target was considered an overall success in reducing waiting times and increasing patient satisfaction."

Renaud, Santin, Coma, Camus, Van Pelt, Hayon, Gurgui, Roupie, Herve, Fine, BrunBuisson, &Labarere (2009) report that delayed-transfer patients had a higher 28-

day mortality rate (23.4% vs. 11.7%) and a longer median hospital length of stay (13 days vs. 7 days) than direct-transfer patients. Patients who were directly transferred to the ICU from the ED had a mortality rate of 13.6% and patients who had a delayed transfer of at least 3 days had a mortality rate of 19.6% (Renaud et al., 2009).

The understanding that patient turnaround time is directly related to service quality prompted a large number of studies to focus on how to reduce this time (Gandhi et al., 2003; Lane et al., 2000; Gonzalez et al., 1997; Braly, 1995).

To explain the concept of ED overcrowding, Regan (2000) states that "The phenomenon of ED overcrowding can be easily described through Little's Law $\lambda=W/L$ (Little, 1961) where λ denotes the average arrival rate of entities to a system, L denotes the average turnaround time of these entities in the system and W denotes the average number of entities in the system at any given point in time. Little's Law clearly shows that any rise in the patient arrival rate, while the patient turnaround time remains constant, will result in an increase in the number of patients in the ED until a state of overcrowding is reached. Overcrowding usually aggravates patient discontent, particularly due to a decrease in the privacy these patients experience in the ED. Patient discontent may also raise frustration among the medical staff. When frustration leads to an increase in the staff's treatment time, i.e. when patient turnaround time becomes a function of patients' arrival rate – L(λ), the outcome may be even worse. At this point, ED overcrowding can become critical. It is obvious that under such circumstances the service quality offered to patients, patients' health, and even the clinical outcome may be affected. Therefore, turnaround time needs to be addressed, analysed and, wherever possible, reduced in order to improve patient satisfaction and recovery."

METHODOLOGY

- **Study design:**AProspective Observational Study was conducted at Max Super Speciality Hospital, Vaishali.

- **Study duration:**The study was carried out for a period of 3 months (February 06, 2017- May 05, 2017)

- **Study area:** Emergency Department at Max Super Speciality Hospital, Vaishali.

- **Sampling technique:** Convenient sampling

- **Sample size:** A total of 172 patients were observed during the study.

- **Data collection method:**
    - Primary data collection: Direct observation and recording the findings in a customised ER list. Information was also collected by discussion with the ER staff.
    - Secondary data collection from HIS and ER register.

The data was captured as per the following parameters:

- **In time:** The time when the patient arrives at the Emergency department.
- **Attended by EMO:** The time when the patient is seen by the Emergency Medical Officer.
- **Consultant (Call Time):** The time at which the consultant from the concerned department was informed about the patient.
- **Consultant (Review):** The time at which the consultant reviews the patient in ER.
- **Admission/ Discharge advice given by doctor:** The time at which the doctor fills the admission request form and hands it over to nursing for further processing.
- **Admission time/ Discharge time:** The time of giving admission or discharge (as reflected in the system).
- **Shifting/ Discharge time:** The time at which the patient moves out physically from the Emergency Department. (either for admission or discharge)

- **Inclusions:** Patients arriving at the emergency department between 9am-6pm were taken for the study.

- **Exclusions:**
    - Patients arriving at the emergency before 9am and after 6pm
    - Brought dead cases
    - Patients who died during the treatment in ER

Study Tools Used:

- Observational study was used to understand the processes in Emergency department.
- Statistical analysis Data was done using Microsoft excel to calculate The Turnaround Time of the patients in the Emergency Department as well as to calculate the delay in moving out the patient from the ER (shifting to ward/ ICU/ OT or discharge)

Turnaround Time (TAT) = Admission time (also k/a bed allotment time) – Patient In time

Delay in shifting the patients= Physical shifting time from Emergency Department- Admission time

- Brainstorming sessions were undertaken to find out the causes for delay.
- Fish bone diagram was used to understand the causes of delay.

ETHICAL CONSIDERATIONS:

- Confidentiality of Patients was maintained.
- Information received was not be misused in any form.
- Data collected will solely be used for the purpose of academic project
- The study was undertaken with due consent of departmental head

RESULTS:

- Average Turnaround time = 3:09 hours.
- Average Turnaround time of delayed cases= 6 hours
- Average time for delay in physical shifting of the patient= 45 minutes.

28% of the cases (i.e. 48 cases) recorded a TAT of more than 4 hours with an average TAT of 6 hours i.e. an average delay of 2 hours. Of all the delayed cases, 37% were cash & TPA patients while 67% of patients belonged to PSU. The major factors identified for an increase in Turnaround Time were non availability of beds in 81% of the cases, delay from investigations in 25% of the cases and communication failure

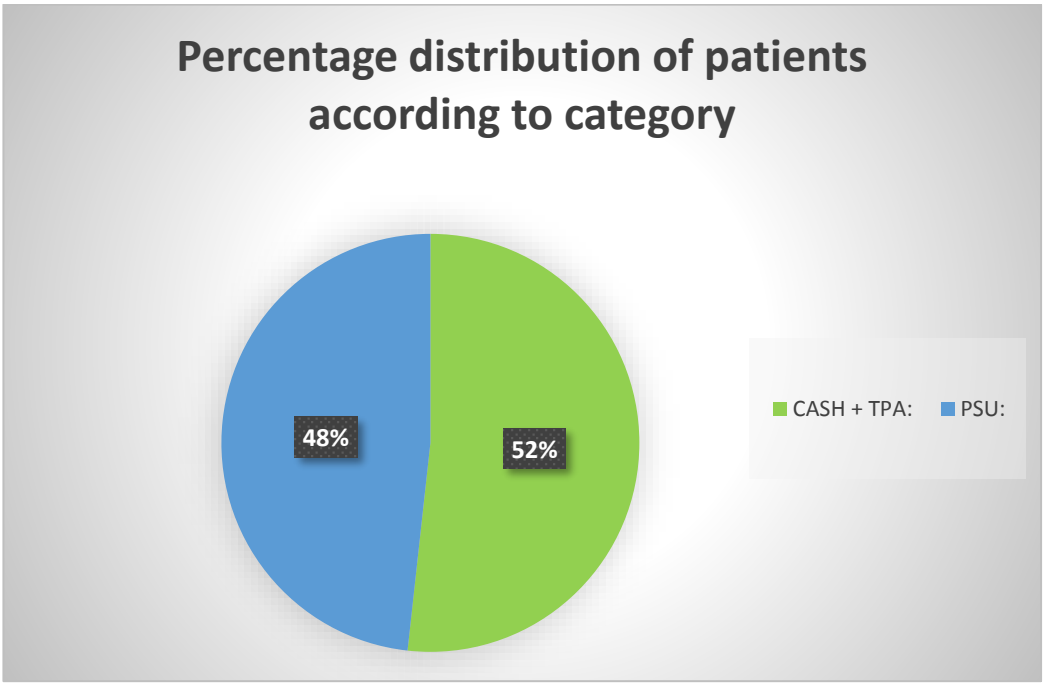
between nursing and the front office staff in 19% of the cases. Delays in patient transfer were caused due to non-availability of GDAs in 43% of the cases and non-availability of nurses in 28% of the cases while housekeeping related issues and lack of coordination between nursing and admission staff was observed in 10% and 12% of cases respectively.

I. Percentage distribution of patients according to category:

The data for a total of 172 patients entering Emergency Department was captured.

- 48% of the patients belonged to the category of PSU.
- 52% of the patients belonged to the category of cash and TPA.

Figure 1

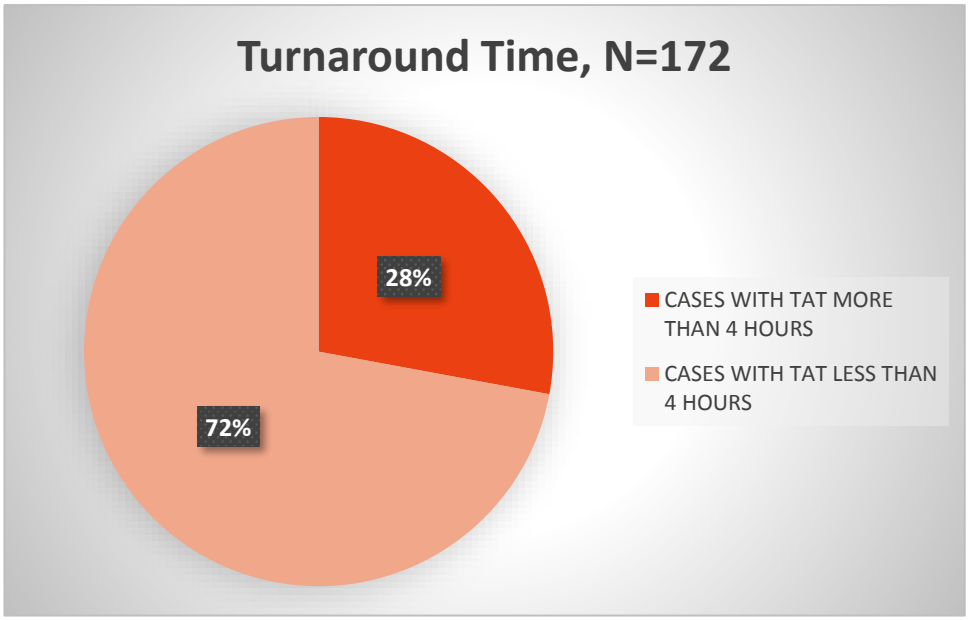


II. Percentage distribution of cases according to Turnaround Time:

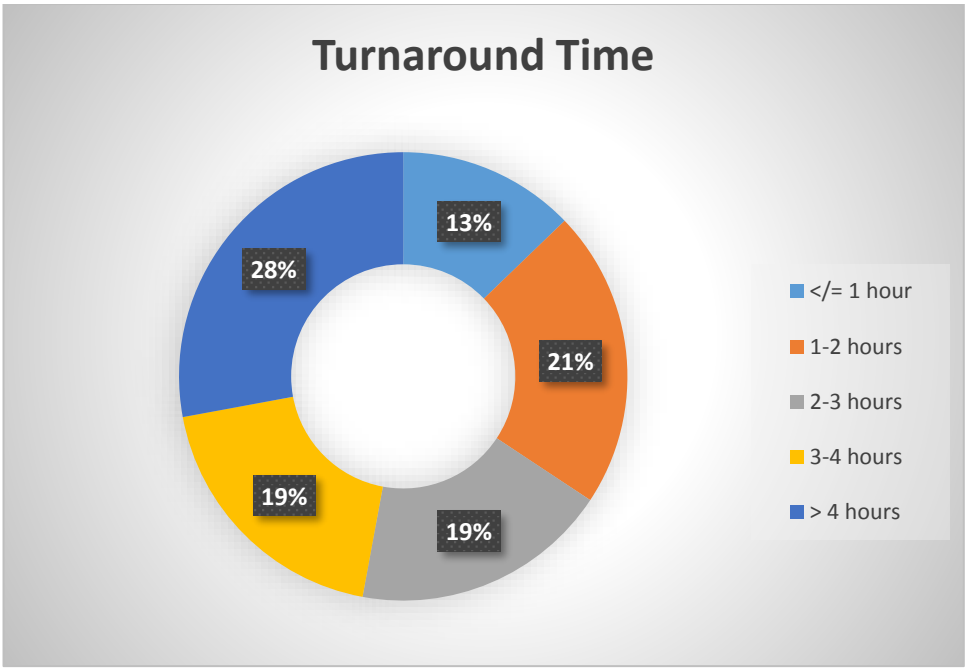
The Turnaround time for all 172 cases was calculated and compared against a benchmark of 4 hours.

- 48 cases (i.e. 28%) recorded a TAT of more than 4 hours with an average TAT of 6 hours i.e. a delay of 2 hours
- While 124 cases (i.e. 72%) recorded a TAT of less than 4 hours.

Figure 2



III. Overall distribution of Turnaround time:



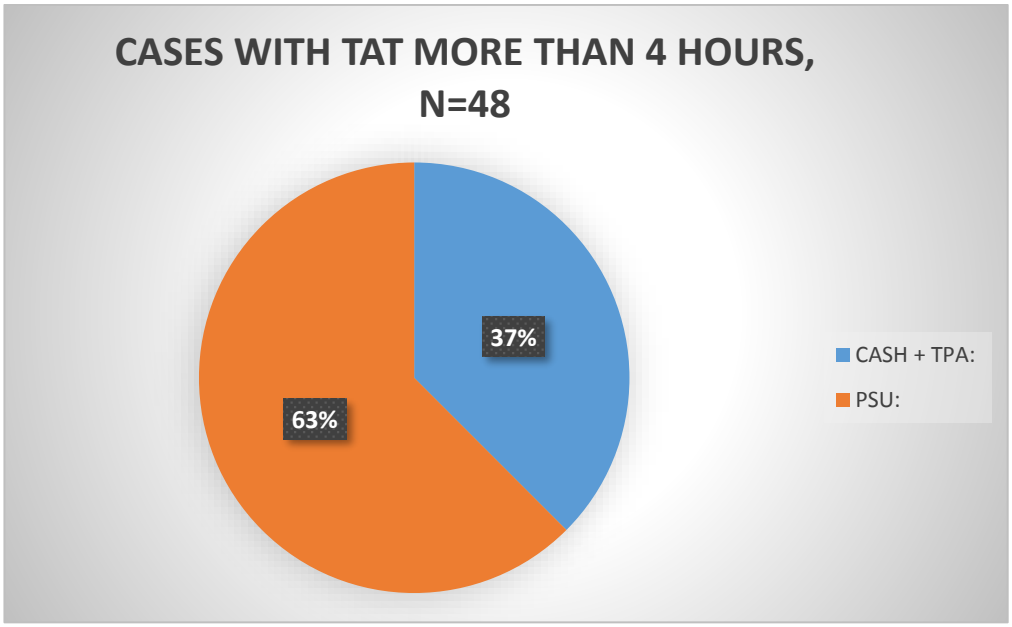
- It was observed that only 13% of the patients had a TAT of less than 1 hour i.e. they were admitted or discharged within 1 hour.
- On the other hand, 28% of the patients experienced a turnaround time of more than 4 hours in the Emergency Department.

IV. Percentage distribution of delayed cases according to category:

Of all the cases with a delay in TAT above 4 hours:

- Cash and TPA cases were 18 (63%)
- PSU cases were 30 (63%)

Figure 3



V. EMO TAT:

EMO TAT: All patients in the ER should be attended within 5 minutes of arriving by the Emergency Medical Officer.

- In this study, all the patients were attended by the Emergency Doctor within an average of 8 minutes.

VI. CONSULTANT TAT:

- Average consultant TAT: **18 minutes**

The average turnaround time for consultant review was 18 minutes which was well within the TAT benchmark of 1 hour.

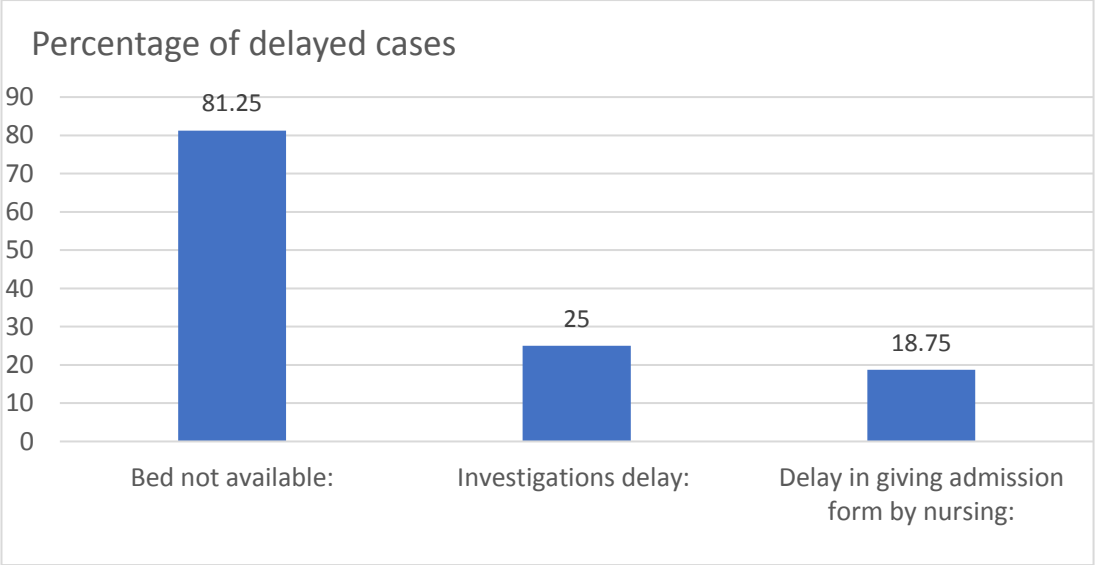
VII. Reasons for prolonged Turnaround Time:

Table 1:

REASONS	Cases	Delayed cases	Percentage of Delayed Cases
Bed not available:	39	48	81.25
Investigations delay:	12	48	25
Delay in giving admission form by nursing:	9	48	18.75

Figure 4

Reasons for prolonged Turnaround Time



- The main reason causing a delay in shifting of the patients from ER to ICU/ wards was the non-availability of beds which constituted 81% of the causes. A delay in the discharge process directly impacted the availability of beds due to which the patients had to wait in the ER causing overcrowding.
- While a delay in investigations also lead to an increased TAT in every one out of four cases.
- On further analysis it was observed that for all the cases for whom the beds were not available were of the following categories:
    - 13 patients belonged to the category of Cash & TPA
    - 26 patients belonged to the category of PSU.

VIII. Reasons for delay in physical shifting of the patients:

97 cases out of a total of 172 reported a delay in physical shifting of the patient from ER. (Time taken to shift the patient was more than 20 minutes).

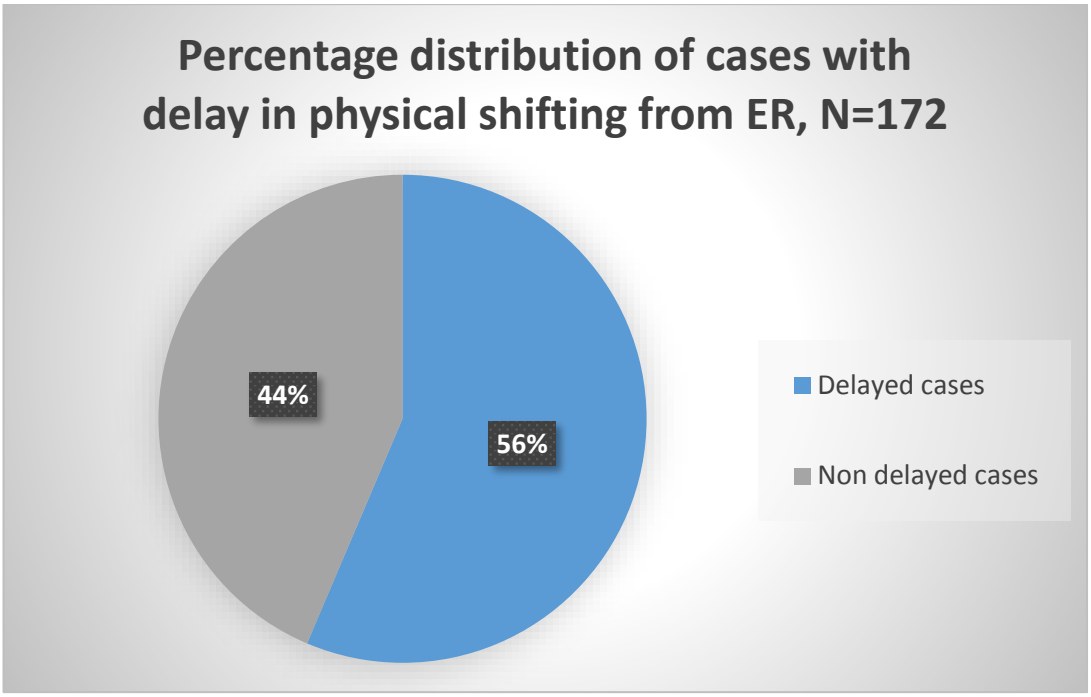
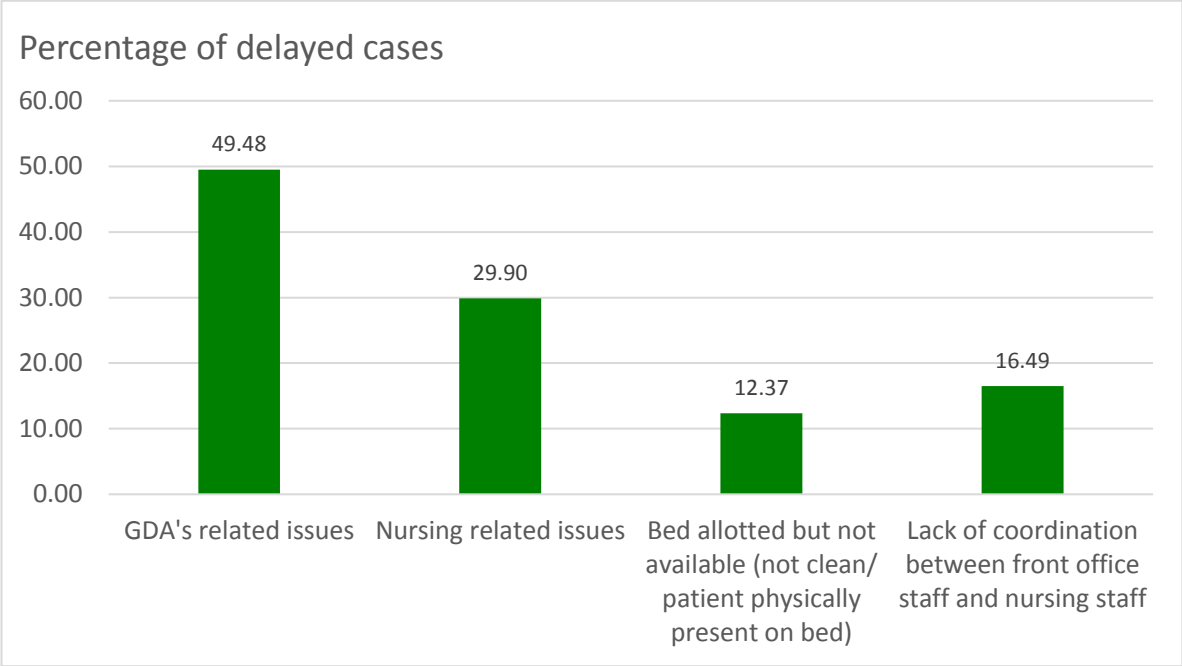


Table 2:

REASONS:	CASES	DELAYED CASES	Percentage of delayed cases
GDA's related issues	48	97	49.48
Nursing related issues	29	97	29.90
Bed allotted but not available (not clean/ patient physically present on bed)	12	97	12.37
Lack of coordination between front office staff and nursing staff	16	97	16.49

Figure 5

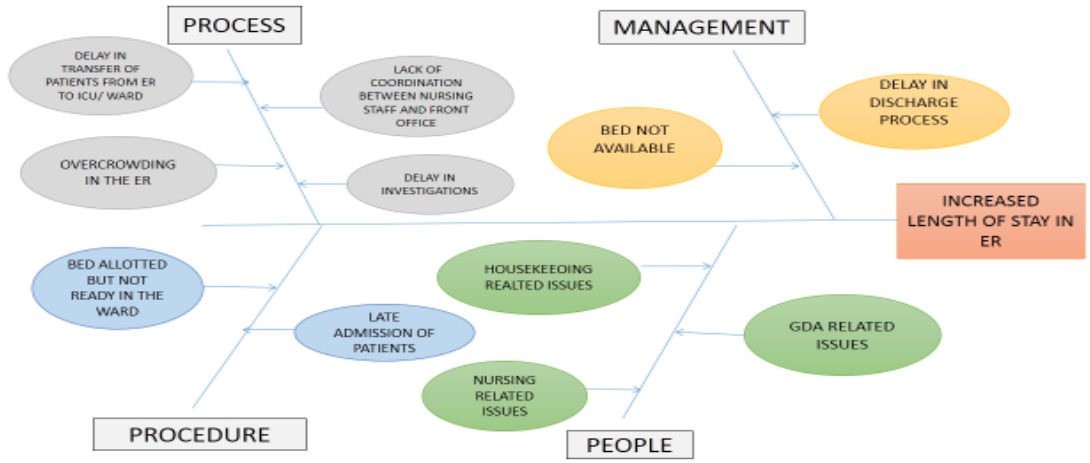
Reasons for delay in physical shifting of the patients:



- In approx. 43% of cases, non-availability of GDAs was observed as one of the major cause for delay in patient transfer.
- 28% of the delays were caused due to nursing related issues. A time interval where the nursing shifts were changed and handover took place, was identified as the period where nurses were not available to shift patients. Also, as every nurse had been allotted 2-3 beds, so while one patient was shifted, it did cause a delay in shifting the other patient of the same nurse.
- In 10 % of the cases, bed was allotted but was not available as it was not clean or in some cases the patient was physically present on the bed.
- Lack of coordination between the front office staff and the nursing staff was observed in approximately 12% of the cases. (Delay in communication between admission department and nursing staff). Many times the bed was allotted but admission department delayed in informing the ER nurses.

FISHBONE DIAGRAM:

Figure 6



This tool helped to find out all the possible causes for increased length of stay in the ER thereby increasing the Turnaround Time.

LIMITATIONS:

- Patients in ER, only during the duty hours, were observed for the study. Patients arriving before 9am and after 6pm could not be taken into consideration.
- Sundays and public holidays were excluded during the study.
- No questionnaire was designed to record the view of clinicians and staff.

DISCUSSION:

Robert Wood Johnson Foundation (2008) quoted "Long wait times and an inefficient admissions process are problems that busy emergency departments often face." Similarly, ClinLeadershManag Rev (2004) reported that "The emergency departments (ED) at many medical centers are experiencing increased crowding and prolonged ED patient length of stay. During periods of heavy patient volume, the ED may go on divert status and be unable to care for new patients except for life-threatening illness." This had been proved in our study that a prolonged length of stay in ED has been one of the major problems faced by the department thereby increasing the Turnaround Time of ED.

The average Turnaround time in our study was 3:09 hours. Similar to this, Bukhari H et al. (2014) revealed that in their study "The mean LOS was 3:02 hour (SD = 5:03 hour). 23.4% of visits to ED had a delay in LOS more than four hours. Prolonged LOS was

associated with prolonged laboratory and consultation time, patient admission to observation or trauma areas, critical care management patients, and prolonged final decision time to time of physical response to the final decision."

A study by Mortimore A, Cooper S (2007) claimed that "The 4-hour target was considered an overall success in reducing waiting times and increasing patient satisfaction." In our study, 172 patients were observed during the study period, keeping in mind a benchmark of 4 hours for TAT. While not all of the 172 patients observed, had a TAT of more than 4 hours, yet a significant percentage (approx.30%) crossed the benchmark. "This needs to be addressed as if the most of their length of stay in ER is spent only waiting and doing nothing, it will probably reflect badly on their service quality perceptions"(Sinreich D andMarmor Y, 2005)

As stated by Halland Press, 1996 and Fernandes et al. 1994, waiting for bed and waiting for test results also impacted service quality in ED. In our study. 81% of the patients experienced waiting for beds due to a delay in discharge process in wards, which directly led to an increased Turnaround Time for those patients.

CONCLUSION:

Turnaround time is an effective indicator to measure ER performance. Our data suggests that patients presenting to the ER had long waiting times due to various reasons. Causes that delayed the Turnaround time of patients in ER were non-availability of beds, delay in investigations and communication failure between nursing and the front office staff. While other reasons like GDA, nursing and housekeeping related issues further delayed the shifting of patient from ER, leading to an increase in the length of stay for patients. Addressing these factors would decrease the TAT to an optimum level.

RECOMMENDATIONS

- Admission lounge should be provided for the patients to be admitted. This will help in vacating the beds in Emergency without causing patient discomfort.
- Fast track discharge process with prompt action form floor coordinators.
- Regular trainings conducted for the staff.
- Time for physical shifting of the patient should be noted in the HIS.
- On bed allotment, a notification should be reflected in the system at nurse station, so as to avoid any delay in shifting patient.

- Integration of HIS on doctor's smart phone showing the patient's parameters and Investigations

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