UTILIZATION OF FMEA AS A TOOL TO UNDERSTAND THE CAUSES AND ADVERSE EFFECTS OF OVERCROWDING OF EMERGENCY DEPARTMENT IN HJ HOSPITALS, KINSHASA

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

Anish Kumar Adak

Under the Supervision and Guidance of

Dr. Sandesh Kumar Sharma

2024

Date: 15th July 2024

TO WHOM SO EVER IT MAY CONCERN

This is to certify that Dr. Anish Kumar Adak, an Indian national and the holder of passport number #X4215397 is working with HJ Hospitals as designation **Assistant Manager-Clinical**.

Also, Dr. Anish Kumar Adak has done his dissertation project alongside his employment.

Dated- 10.05.2024 to 15.07.2024

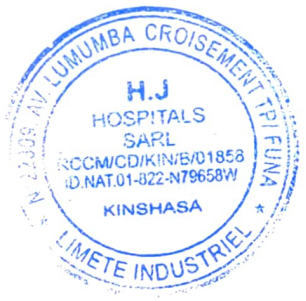
For HJ Hospitals, Kinshasa, Democratic Republic of the Congo,

Best Regards,

Gyanendra Singh

Manager - HR

15/7/2024



DECLARATION BY STUDENT :

I hereby declare that the dissertation titled " UTILIZATION OF FAILURE MODE AND EFFECT ANALYSIS TO UNDERSTAND THE CAUSES AND ADVERSE EFFECTS OF OVERCROWDING IN EMERGENCY DEPARTMENT" is the bonafide record of my original research work. I declare that it has not been submitted to any other institution or university for the award of any degree or diploma. Any information derived from other published or unpublished works have been duly acknowledged in the text.

Name of the student : DR. ANISH KUMAR ADAK

Date : 10th July 2024

IIHMR UNIVERSITY

Certificate

This is to certify that dissertation titled **"Utilization of Failure Mode and Effect Analysis to Understand the Causes and Adverse Effects of Overcrowding in Emergency Department at HJ Hospitals, Kinshasa, DRC."** is a record of the research work undertaken by **Dr. Anish Kumar Adak** in partial fulfillment of the requirements for the award of the degree of MBA (Hospital and Health Management) from the IIHMR University, Jaipur under my guidance and supervision and his approach to the research study has been sincere, scientific, and analytical.

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ABSTRACT

INTRODUCTION

HJ Hospital is a multispecialty hospital located in Central Africa by Mr Harish Jagtani, who is an entrepreneur of Indian origin residing in Kinshasa, DRC, since two decades.

The hospital is a state of the art facility with diagnostic center with all facilities

available in the 205 bedded multispecialty facility in Central Africa.

The center was inaugurated on 2nd April, 2016. It is equipped with high end radiology equipments like xray, CT scan, MRI, Mammography, bone densitometry and OPG.

Other services include ECG, TMT, PFT, ophthalmology, audiometry. The addition Clinic Limete for maternity and NICU was a major inclusion for HJ Hospital in the recent years.

OBJECTIVE

- To understand the underlying causes of ED overcrowding and their adverse effects .
- To provide solutions to reduce Average Length of Stay (ALOS) of patients admitted in ED.
- The objective of the study is to analyze the ED patients conversion to IPD (Wards, OT and ICU).

METHODOLOGY

STUDY DESIGN:

At HJ Hospital's ED, a prospective cohort study was done on 1500 patients in the first quarter of 2024. Data was gathered from the ED to make a thorough trend analysis.

SETTING:

The study was conducted in Emergency Department of HJ Hospitals, Kinshasa, DRC.

STUDY POPULATION

- Inclusion criteria: The monthly patient flow in the Emergency Department along with ALOS was analyzed. The patient encounter in ED till discharge/exit or admission to IPD is recorded through excel data tracker sheets and coordination with ED.
- Study tools: Patient journey in ED - data which included admission, discharge and admission from ED to IPD or OT. Extensive use of Hospital Operating System (HOPS) was done (PROSPECTIVE COHORT STUDY).
- Exclusion Criteria : Patients receiving required treatment within the TAT in emergency department.

DURATION OF STUDY: 3 months of sample data collected.

SAMPLE SIZE: 1500 patients in the Emergency Department.

DATA COLLECTION PROCEDURE: The data was collected through Hospital Operating System of ED in coordination with Nursing In charge and In house doctors in ED.

RESULTS:

The higher rate of conversions was seen in the department of Internal Medicine as high as 61 percent of the total IPD conversions. The main focus was on the gaps which caused overcrowding in the ER leading to increased TAT and patient Length of Stay.

CONCLUSION:

In conclusion, the FMEA model at HJ Hospitals, Kinshasa provides valuable insights into various aspects of inpatient service gaps and admission conversion into IPD within the hospital setting. Through the utilization of FMEA in Emergency Department, the assessment has shed light on areas of strength as well as areas for improvement.

The assessment has highlighted the importance of effective communication between medical staff and patients, the delivery of high-quality care during hospital stays, accessibility to medical services and information, coordination of care among different healthcare professionals, and overall patient care satisfaction with their experience in the ED without extending the length of stay.

While certain aspects of ALOS may align with desired standards, there are opportunities for enhancement in other areas. Addressing identified gaps through targeted interventions and improvements is crucial to elevating the standard of care and ensuring optimal patient experiences within the ED at HJ Hospitals, Kinshasa, DRC.

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Dr. Anish Kumar Adak

MBA HM 27

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ABOUT HJ HOSPITALS, KINSHASA, DRC

VISION : The vision of HJ Hospital is to become the leading healthcare facility in entire Africa with the purpose of serving high quality healthcare services to the people and bring the ultimate change in African healthcare sector.

MISSION : The mission of HJ Hospital is to inculcate the best in class healthcare services to the people in entire Africa in the field of intervention, surgical and diagnostic services.

CORE VALUES : providing the best quality standards to the people with the most reasonable justified packages and make the healthcare facility available for everyone.

CURRENT PRESENCE :

1. HJ CLINIC - LIMETE
2. HJ CLINIC - GOMBE
3. LUBUMBASHI
4. HJ CLINIC – NSELE

SPECIALTIES PROVIDED :

- Cardiology
- Surgical oncology
- Maternity and NICU
- ENT
- Ophthalmology
- Urology
- Neuroscience
- Dentistry
- Diagnostics
- Physiotherapy
- Dermatology, Lasers and Cosmetic Sciences
- Orthopedics
- Laparotomy and general surgery
- Gastrointestinal specialty

- Critical care unit and Emergency room
- Nephrology specialty
- Medicine-Internal
- Plastic Surgery

HISTORY : HJ Hospital is a multispecialty hospital located in Central Africa by Mr Harish Jagtani, who is an entrepreneur of Indian origin residing in Kinshasa, DRC, since two decades.

The center was inaugurated on 2nd April, 2016. It is equipped with high end radiology equipment's like x-ray, CT scan, MRI, Mammography, bone densitometry and OPG.

Other services include ECG, TMT, PFT, ophthalmology, audiometry. The addition Clinic Limete for maternity and NICU was a major inclusion for HJ Hospital in the recent years.

INTRODUCTION

CHAPTER 1- UTILIZING THE FMEA TOOL TO UNDERSTAND AND ANALYZE THE CAUSES AND ADVERSE EFFECTS OF OVERCROWDING IN EMERGENCY DEPARTMENT.

Emergency Department plays a crucial role in treating and stabilizing the life threatening urgent cases 24*7. Emergency department becomes the first point of care for patients having urgent and life saving health care needs which is specialized in Emergency Medicine and provide acute care to patients who arrive at emergency by themselves or through ambulance.

Although there are few loopholes in healthcare system which causes the Emergency Department to be abused or overused.

There is a potent co-relation between patients getting admitted in ED and their psychological state. Not every other patient who gets admitted to Emergency is under urgent or life threatening situations. This is further explained in the following report ahead.

SIGNIFICANCE OF THE STUDY

This study allowed us to understand the causes of overcrowding in ED and their adverse

effects which includes aspects of staff, equipment's and longer waiting times for patients. FMEA method was a crucial part of the study to understand and find the root cause of problems.

FMEA : Failure Mode and Effect Analysis is a tool used to identify drawbacks and setbacks of a process in the most minimal budget possible.

In context of this study, potential errors included insufficient triage protocol, patient abusing ED system by admitting themselves without urgent life threatening issues and patients also admit themselves to ED to skip the waiting times for OPD and to receive immediate care, which is not ethical. Through this study we have worked upon solutions to prevent ED overcrowding and abuse.

PROBLEM STATEMENT:

The primary issue observed in ED are correlated with each other. On average patient ALOS in ED is 6 hours which is higher than the standard TAT. Patient waiting time has increased due to ED overcrowding. Bed availability and management issues arise due to the overcrowding of ED.

KEY WORDS:

- ED
- Overcrowding Of ED
- FMEA
- Patient ALOS

CHAPTER 2- REVIEW OF LITERATURE:

SR NO.	AUTHOR	TITLE	STUDY LOCATION	SAMPLE SIZE AND TECHNIQUE	SALIENT FEATURES
1.	Safari s, Hashemi, Kariman and Rahmati	Utilizing FMEA tool for increasing financial gain of Emergency Department; a	I.H Hospital, Iran.	100 samples**,** Prospective cohort study.	This theoretical study helps to analyze the drawbacks of potential failures in ED which results in financial decline of the hospital.

		Prospective Cohort Study.			
2.	Breanna M. King	Negative impacts of Emergency department overcrowding and longer wait times.	Murray State University	Data collected from West Lincoln Memorial Hospital	The thesis sheds light on the negative impact of healthcare quality services due to ED overcrowding and long patient stays in hospital due to incompetent triaging and bed management.
3.	G. Evren, M. Gulen, A. Avci, I. Ozgur, S. Md, M.S. Gedik, S. Satar	Role of an effective critical care unit in Emergency Department	Adana City Training and research Hospital, Turkey.	Archival data from 2015 to 2016 in ED. 8254 patient size.	The analysis of the study focused on follow up of the patients who got their continued care from ED to critical unit care.

CHAPTER 2: METHODOLOGY

STUDY DESIGN:

1500 sample data of emergency department in the HJ Hospitals . Data is gathered from the 1st quarter of 2024 through HOPS and excel daily data tracker.

SETTING:

HJ Hospitals – Emergency department in the hospital.

STUDY POPULATION

 Inclusion criteria: 1500 samples for 1st quarter of 2024 data was collected from HOPS in Emergency Department of HJ Hospitals, Kinshasa, DRC.

 Study tools: Prospective Cohort Study was used. Hospital Operating System (HOPS) was extensively used to import data. Microsoft Excel was used to track data in ED.

DURATION OF STUDY: 3 months duration of sample data collected.

SAMPLE SIZE: 1500 sample of patients in the Emergency Department.

DATA COLLECTION PROCEDURE: The data was collected through excel sheet and HOPS of HJ Hospitals.

DATA ANALYSIS PLAN:

Data was analysed through Microsoft excel pictorial representations and comparative analysis. Alongside these factors RCA was also incorporated to find the depth of overcrowding in ED.

ETHICAL CONSIDERATIONS: Informed consent was taken from HJ hospitals, Kinshasa. Privacy of data is regularly maintained in ED and IPD.

IMPLICATIONS OF RESEARCH: This research was useful for the hospital to keep an account of the assessing patient ALOS, overuse of ED, non-urgent non-life-threatening cases analysis which led to longer wait times and bed unavailability in ED.

RESEARCH QUESTIONS:

- What are the underlying causes of ED overcrowding and their adverse effects ?
- Available solutions to reduce Average Length of Stay (ALOS) of patients admitted in ED?
- What was the ED patient's conversion to IPD (Wards, OT and ICU) ?

What are the underlying causes of overcrowding in Emergency Department?

The Emergency Department workforce has 3 components :

1. Nurses and in charges
2. Doctor on duty
3. Consultants
4. General physicians

Major causation factors in overcrowding in ED in broader perspective :

1. Non-emergent Visits
2. Limited In-patient Beds
3. Hospital Downsizing

Overcrowding adverse effects on ED(Emergency Department) :

1. High Out Of Pocket Expenditure
2. medication and treatment errors
3. Bed management issues
4. Fluctuations in deaths and HAI
5. Increased patients length of stay for patients
6. Degraded primary care to patients

Suggestions and takeaways :

1. Implementation of organizational structures
2. Developing triage nursing team

DATA ANALYSIS AND FINDINGS:

Specialty wise admission rate of patients admission :

	Qtr. I		
	Jan-24	Feb-24	Mar-24
Patient Flow	577	522	537
Admission	212	188	195
% Conversion	37%	36%	36%

IP Conversion					
Doctor Name	DEPARTMENT	24-Jan	24-Feb	24-Mar	Grand Total
Dr. Kaushik Parmar	INTERNAL MEDICINE	120	86	102	308
Dr. Abdul Zilani	NEUROLOGY	6	12	17	35
Dr. Sabarimalai	GASTROENTEROLOGY	3	9	14	26
Grand Total					

Month	Total No. of Patients	Within TAT (up to 6hrs stay)	No. of Patients staying more than 6 hours
January	568	516	52
February	518	477	41
March	535	502	33

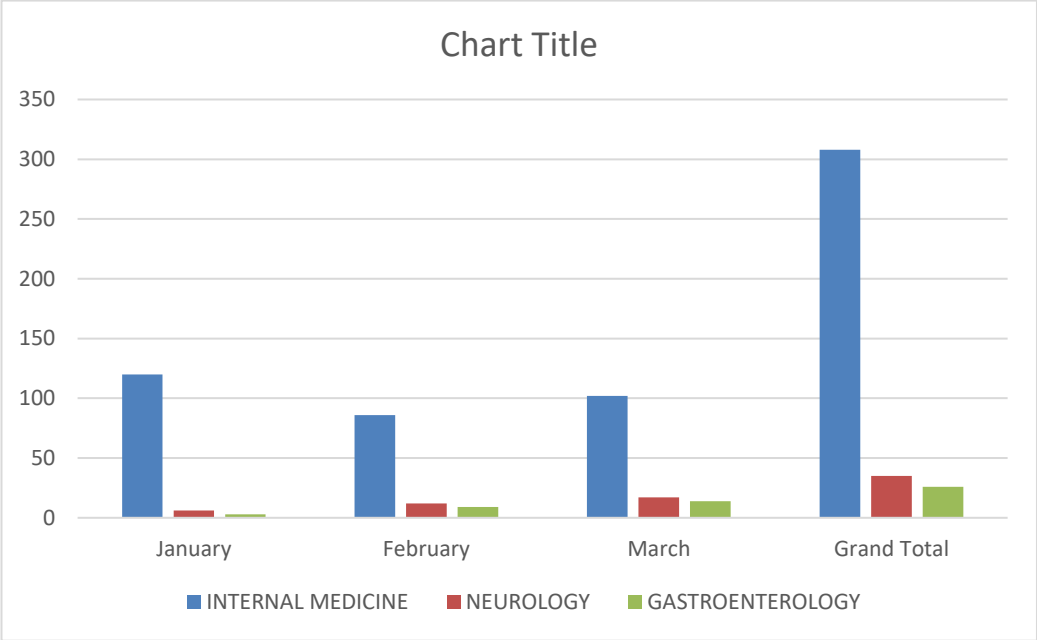

Fig 1. Top three specialty admissions in 1st quarter of 2024 from Emergency Department.

Average TAT of Emergency Patients :

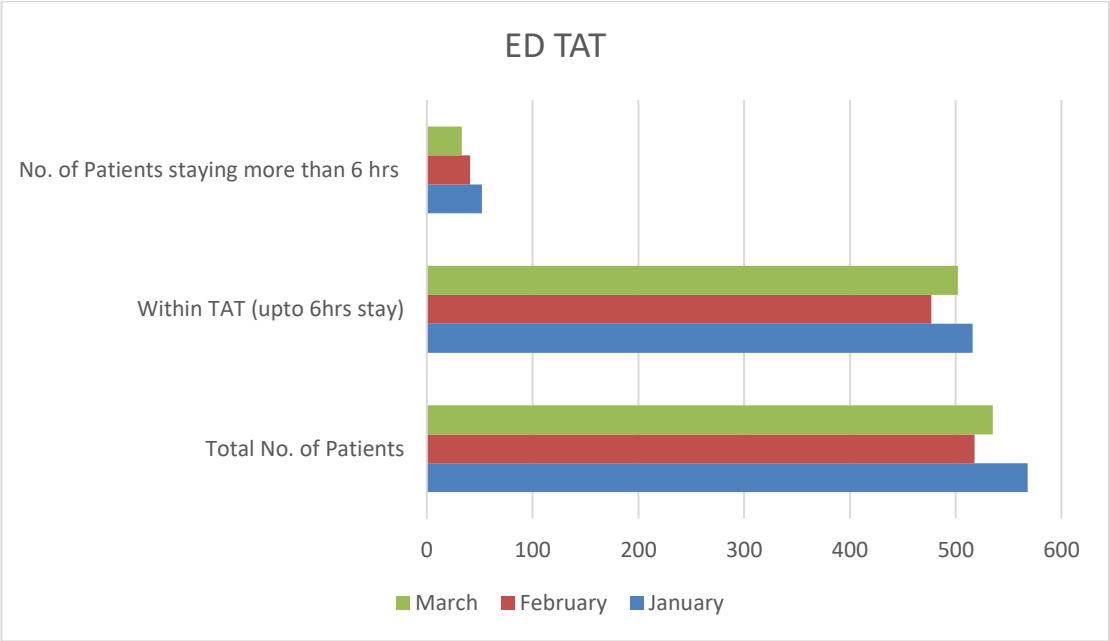

Fig 1.1 TAT of ED patients on average per month, depicting a constant decline in average TAT.

Takeaways :

- There has been a significant decline in average length of stay of patients in Emergency Department.
- The constant decline in ALOS continues from January to March which is a good sign of efficiency.

MORTALITY AND BROUGHT DEAD PATIENTS :

Month	No. of Mortality	Brought Dead
January	1	0
February	1	5
March	0	4

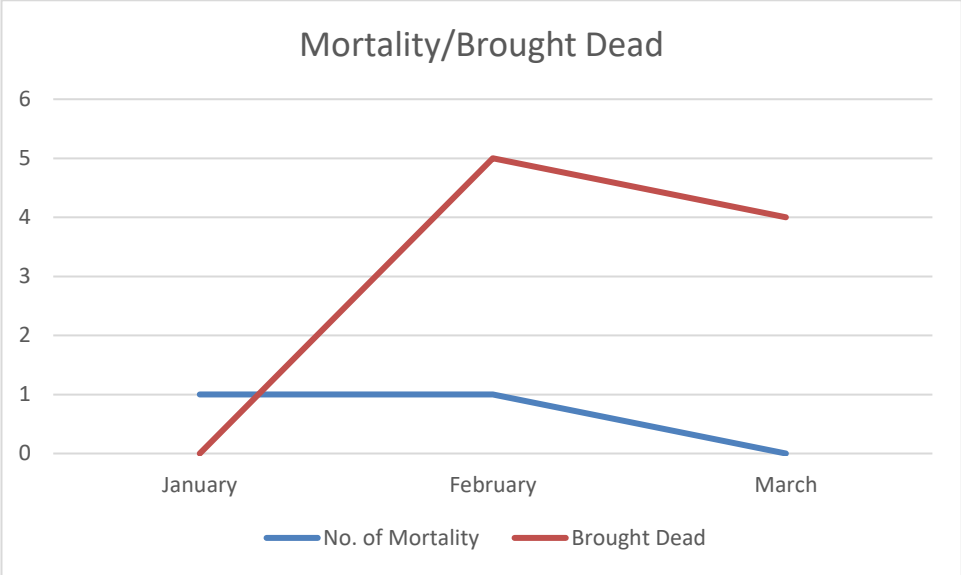

Fig 1.2 The line graph shows the no. of mortality and brought dead patients in 1st quarter of 2024. Mortality has gone down to zero in the month of March.

Takeaways :

The mortality rate has been 0 in the month of March compared to January in the first quarter of 2024.

DISCUSSION:

Understanding overcrowding causes and adverse effects within the Emergency services in the ED (Emergency Department) at HJ Hospitals, Kinshasa is crucial for improving the overall patient experience. This are evaluated on different aspects: such as:

Areas for Evaluation:

- Healthcare Providers:
- Doctor's response time

- Availability of doctors for emergency and addressing concerns.
- Competence and expertise of doctors and nurses based on examination

Nursing Care:

- Responsiveness and attentiveness of nurses to triaging
- Adequacy of patient management and other primary procedures.
- Emergency triaging system and priority basis of treatment

Hospital Amenities:

- Availability of ED beds and facilities.
- Quality and timeliness of service provided
- Efficiency of first encounter intervention and admission to IPD

Communication and Transparency:

- Clarity of information provided about diagnosis, treatment plan, and billing procedures
- Timely reports on patient investigations and discharge/admission procedures.
- Availability of staff for addressing patient overflow and concerns.

CONCLUSION:

The study on UTILIZATION of FMEA AS A TOOL TO ANALYSE AND SUMMARIZE THE OVERCROWDING ADVERSE EFFECTS/CAUSES AT EMERGENCY DEPARTMENT of HJ Hospitals, Kinshasa has brought in limelight the consequences of overcrowding in patient flow and efficiency of providing primary care at ED. There are multiple adverse effects which can be summarized as :

Major causes of overcrowding in ED in broader perspective :

1. Non-emergent Visits
2. Limited In-patient Beds

3. Hospital Downsizing

Overcrowding adverse effects on healthcare :

1. High OOP expenditures
2. medication and treatment errors
3. Bed management issues
4. Fluctuations in deaths and HAI
5. Increased patients length of stay for patients
6. Degraded primary care to patients

The variable factor that is often the underlying cause is the ED overuse by patients themselves. In short the patients who don't need emergency care are those who don't have any life threating health issues. Yet the psychological tendency of patients to skip long waiting times in OPD and opting for ED cause the extra hours of lab investigations which in turn increases the TAT timing of other critical patients waiting for primary care. The ED staff unfortunately have to provide care to all urgent and non-urgent patients together. Most insured patients on the other hand are solely in the belief that if there out of pocket expenditure is reimbursed or covered by insurance company then why should they opt for OPD care and not directly access the ED services which are done on priority. Many patients stay for longer in ED due to other reasons like absence attendant to take them back home, or inability to manage payment options. There are multiple reasons for ED overcrowding among which we have worked upon the critical issues leading to inefficiency in providing care to the patients in need and resolve issues of dissatisfied patients.

RECOMMENDATIONS :
Targeted Recommendations for Improving patient flow efficiency in Emergency Department :

Implement Organizational Structures :
Patient flow and encounter in Emergency department is one of the crucial deciding factors in a healthcare setting. To manage patient efficiently, the patients need to be addressed in priority basis of urgency. Any patients that require surgical interventions should be admitted into IPD, and ED bed should be vacated for the next patient. The lab investigation report TAT must be within the standard time in order to shift patients to wards or discharge them after providing primary care at Emergency.

Developing Nursing Triage Systems :
Triaging of non-urgent patients needs to be stringent in-order to manage the crowding and prevent over-use of Emergency Department. Many patients come to ED to escape the hassle from waiting in OPD for consultations. The next category of patients include those who are the credit or insured patients, these patients exploit the ED by presenting them in non-threatening health issues just because they are insured. Hence forth the ED team needs faster triaging in order to send back patients for homecare or OPD in order to vacate ED beds.

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