Dissertation at

Max Super Speciality Hospital, Patparganj

By

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International Institute of Health Management Research

New Delhi

Dissertation at

Max Hospital Super Speciality, Patparganj

Evaluation of Drug Availability in OP Pharmacy

By

Dr. Nikita Alexander

Under the guidance of

Mrs. Kirti Udayai

Post-Graduate Diploma in Hospital & Health Management

2014

International Institute of Health Management Research

New Delhi

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The Certificate is awarded to

Dr. Nikita Alexander

In recognition of having successfully completed her

Internship in the department of

Service Quality

And has successfully completed her Project on

"Evaluation of Stock Availability in OP Pharmacy"

From **5th March 2014** till **5th April 2014**

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

We wish her all the best for future endeavors

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This is to certify that Dr. Nikita Alexander, student of Post Graduate Diploma in Hospital and Health Management (PGDHM) from International Institute of Health Management Research, New Delhi has undergone internship training at Max Super-Specialty Hospital, Patparganj & Max Hospital, Pitampura from 05.03.14 to 07.05.14.

The Candidate has successfully carried out the study designated to her during dissertation and her approach to the study has been sincere, scientific and analytical.

The Dissertation is in fulfillment of the course requirements.

I wish him all success in all his future endeavors.

9/5/14

Dean, Academics and Student Affairs Professor
IIHMR, New Delhi
Delhi

Assistant Professor
IIHMR, New

Certificate Of Approval

The following dissertation titled "**Evaluation of Drug Availability in OP Pharmacy"** at **Max Super Specialty Hospital, Patparganj,** is hereby approved as a certified study in management carried out and presented in a manner satisfactorily to warrant its acceptance as a prerequisite for the award of **Post Graduate Diploma in Health and Hospital Management** for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

Dissertation Examination Committee for evaluation of dissertation.

Name	Signature
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DR. B.S. SINGH	
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Certificate from Dissertation Advisory Committee

This is to certify that **Dr. Nikita Alexander,** a graduate student of the **Post- Graduate Diploma in Health and Hospital Management** has worked under our guidance and supervision. She is submitting this dissertation titled **"Evaluation of Drug Availability in OP Pharmacy"** at **Max Super Specialty Hospital, Patparganj** in partial fulfillment of the requirements for the award of the **Post- Graduate Diploma in Health and Hospital Management.**

This dissertation has the requisite standard and to the best of our knowledge no part of it has been reproduced from any other dissertation, monograph, report or book.

Institute Mentor Name, NITIN NAVISH GUPTA
DGM – Operations

Designation,

Organization

Max Hospital, Pitampura

Organization Mentor Name Kirti Udaya

Designation, Assistant Professor.

Organization

Certificate by Scholar

This is to certify that the dissertation titled ....EVALUATION OF STOCK AVAILABILITY IN O.P. PHARMACY..... and submitted by Dr. Nikita Alexander, Enrollment No. PG/12/ 055, under the supervision of Mrs. Kirti Udayai, for award of Postgraduate Diploma in Hospital and Health Management of the Institute carried out during the period from 05.03.2014 to 07.05.2014, 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.

Signature

Dr. Nikita Alexander

FEEDBACK FORM

Name of the Student: Dr. Nikita Alexander

Dissertation Organisation: Max Super Speciality Hospital, Patparganj, New Delhi

Area of Dissertation: Service Quality

Attendance: Attended (March) one month of internship.

Objectives achieved: Dr Nikita was utilized in Project data collation & compilation. The objectives were clearly met against the assigned tasks during the Project duration.

Deliverables:
Data management for ① Efficient deployment of GDA
② Stock analysis in OP Pharmacy -

Strengths: → Quick learner & strives to learn.
→ Diligent worker.

Suggestions for Improvement:
→ Enhance analytical skills
→ Proactive learning on individual basis.

Signature of the Officer-in-Charge/ Organisation Mentor (Dissertation)

Dr. Bhamini Thukral
(Assistant Manager - Service Quality)

Date: 2-May, 2014
Place: Max Hospital, Patparganj, New Delhi

Acknowledgement

This study is an accomplishment due to the timely help and constant support of several people. I take this opportunity to express my gratitude towards all those who have been instrumental in the successful completion of this endeavor.

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I am extremely grateful to all the staff of the hospital for their kind cooperation in providing the needed information for the study.

Finally, an honourable mention to the Almighty for his grace and a heartfelt thanks to my beloved family for their great moral support at all times during the project.

Table of Contents

ABSTRACT

Evaluation of Drug Availability in OP Pharmacy

Introduction: Pharmaceuticals are an integral part of patient care. Drug availability plays an important role in patient care, patient satisfaction and revenue generation. Consequences of stock-outs for patients are grave.

Methodology: An Observational Study was conducted in OP Pharmacies. Data collected was mainly primary as well as secondary. Tool used was a separate Observational Schedule for both the areas. A sample size of 530 prescriptions were taken.

Results: The results of this study have shown a total of 183 cases where prescribed drug was not available. 107 cases where substitutes were given and 76 cases were no drug was given. High level of patient dissatisfaction was seen in such cases. Main reason for unavailability was Stock-Outs.

Conclusion: Health care professionals dealing with drug shortages face the challenges of constant switching among different products and using unfamiliar drugs. For the most part, with judicious management of shortage medications are indicated. Stock-Outs can be avoided by simple measures taken by all stake-holders.

Table of Figures

Acronyms

AMS – Assistant Medical Superintendent

CT – Computerized Tomography

CTVS – Cardiothoracic Vascular Surgery

DTC – Drug Therapeutic Committee

ENT – Ear, Nose & Throat

GS – General Surgery

HCW – Health-care Worker

HIC – Hospital Infection Control

HIV – Human Immunodeficiency Virus

ICU – Intensive Care Unit

LEED - Leadership in Energy and Environmental Design

MICU – Medical Intensive Care Unit

Misc – Miscellaneous

MLC – Medico Legal Cases

MOM – Management of Medication

MRD – Medical Records Department

MRI – Magnetic Resonance Imaging

NABH - National Accreditation Board for Hospital and Healthcare Providers

NFD – Non-Formulary Drug

OPD – Out Patient Department

OR – Operating Room

OT – Operation Theatre

PICU – Paediatric Intensive Care Unit

SICU – Surgical Intensive Care Unit

TPA – Third Party Administrator

WHO - World Health Organization

PART I
HOSPITAL PROFILE

Max Healthcare commenced operations in 2001 and is India's first provider of comprehensive, seamlessly integrated, world-class healthcare services. Max Healthcare has 11 facilities in North India, offering services in over 32 medical disciplines. Of this 8 facilities are located in Delhi & NCR and the others in Mohali, Bathinda and Dehradun. These include state-of-the-art tertiary care hospitals in Saket, Patparganj, Shalimar Bagh, Mohali, Bathinda and Dehradun, secondary care hospitals at Gurgaon, Pitampura and Noida and an out-patient facility at Panchsheel Park. The 11 hospitals together have over 1900 beds.

Max Super Speciality Hospital, Patparganj is a premier state-of-the-art NABH accredited multi speciality facility for diagnosis and treatment of advanced and complex diseases. The hospital provides world class care with a service focus and setting unparalleled standards of medical and service excellence with super specializations in the disciplines of Cardiac Sciences, Cancer, Neuro Sciences, Orthopedics (Joints), Urology and Kidney transplants. Max Super Speciality Hospital at Patparganj has been certified with 'Gold' rating by Indian Green Building Council under LEED rating system for Green Buildings. It is a resource-efficient and environment-friendly building equipped with eco-friendly, energy and water efficient equipments and non-toxic and recycled materials. It is the first Gold certified Green Hospital in North India.

Vision:

To deliver world-class healthcare with a service focus by creating an institution committed to the highest standards of medical & service excellence, patient care, scientific knowledge and medical education.

Mission:

Creating unparalleled standards of medical & service outcomes. To be a care provider of first choice, be the principal choice for physicians, and be committed to follow ethical practices.

Passion:

To deliver International Class healthcare with a total service focus, by creating an institution committed to the highest standards of medical & service excellence, patient care, scientific knowledge and medical education

Logo:

The cross is the accepted symbol for Healthcare the world over. The hands within it are inspired by Michaelangelo's famous painting. In this work, which has endured for

centuries, God bestows the gift of life on mankind through his touch, a truly fitting symbol for a group that endeavors to enhance the quality of life through healing and care.

Hospital Specialties:

It offers an array of medical services, ranging from preventive to curative to consultancy. Their specialties include:

*Aesthetic & Reconstructive Surgery

*ENT

*Dietician

*Cardiac Surgery (CTVS)

*Minimal Access Surgery

*Neurosciences

*Oncology / Cancer Care

*Ophthalmology

*Orthopedics

*Nephrology

*Renal Sciences / Kidney Transplant

*Urology / Andrology

Services & Facilities:

MSSH, Patparganj is a centrally air-conditioned hospital with a total bed capacity of more than 400+ beds with Classic Deluxe, Single Deluxe, Standard (twin sharing), Economy rooms. Also there are 10 operation theaters, 1 Cath Lab with DYNA CT and 8 types of ICUs & Highly Equipped Emergency room.

Max Super Speciality Hospital, Patparganj has one super-specialty Cardiac OT, one dedicated Neuro and Ortho OT, two Transplant OTs and three modular operation theatres, one cardiac Cath

Lab with DYNA CT which is first in New Delhi, fully equipped with Coronary Care Unit, Neuro ICU, Transplant ICU, Medical ICU High Dependency Unit, Surgical ICU and Paediatric ICU, Neonatal ICU and Nursery.

Listing the services and amenities that are provided:

- Blood Bank
- 24*7 Max Pharmacy
- Cafeteria - Cafe Coffee Day, Whole Foods, Kwality Express, Temptation cafe.
- Waiting Lounge
- ATM – RBS Bank ATM in Premises, ICICI Bank & HDFC Bank ATM near hospital.
- TPAs

PART II – DISSERTATION REPORT

CHAPTER 1 - INTRODUCTION

A hospital exists to provide diagnostic and curative services to patients. Pharmaceuticals are an integral part of patient care. Appropriate use of medicines in the hospital is a multidisciplinary responsibility shared by physicians, nurses, pharmacists, administrators, support personnel, and patients.

A pharmacy department, under the direction of a qualified pharmacist, is responsible for the procurement, storage, and distribution of medications throughout the hospital. In larger hospitals, satellite pharmacies may bring the pharmacist closer to patient care areas, facilitating interactions between pharmacists and patients. In some settings the pharmacist is used as a resource for medicine information and specialized medication therapy management.

When a pharmacy temporarily has no medicine on the shelf, it is known as a "stock-out". It may affect one medicine or many medicines, or in the worst case, all medicines. A stock-out can be documented at one point-in-time or over a period of days, weeks or months. When there is good stock management systems in place, the stock-out duration will be minimal or, ideally, never.

The consequences of stock-outs for patients are grave:

- They have to travel to other health facilities or private sector which may be far away and often many times more expensive.
- They may go without the medicines they need.
- They may get an alternative, appropriate or not, medicine.
- They lose confidence in the health facility to meet their needs.

Efficient drug management is the key strategy in reducing costs of drugs and ensuring their availability in the healthcare facilities. High incidence of drug stock outs is diverse and imitates perpetual problems including inadequate resources and weak healthcare systems to delineate procurement needs and manage stock flows. The selection of most cost-effective essential drugs to treat commonly encountered diseases, appropriate quantification, pre-selection of potential suppliers, procurement and monitoring of the performance of suppliers and the procurement system can be achieved by adopting efficient procedures. Failure in any of these areas leads to lack of access to appropriate drugs and waste of resources. Lack of properly trained staff in good procurement practices at key positions can also doom any procurement system to failure.

Therapeutic substitution (sometimes called therapeutic interchange) is based on the hospital formulary. The DTC provides guidelines for substituting specific formulary medicines for specific non-formulary medicines (or a specific category of medications), usually for specific disease conditions.

One-third of the global population does not have regular access to essential medicines and in some of the lowest-income countries in Africa and Asia, more than half of the population has no regular access to essential medicines [1]. The World Health Organization (WHO) estimated that over 10.5 million lives a year could be saved by 2015 by expanding access to existing interventions (mostly depending on accessibility to medicines) for infectious diseases, maternal and child health and non-communicable diseases [2].

CHAPTER 2 – LITERATURE REVIEW

A comprehensive search of the National Library of Medicine (NLM) literature indexing database (MEDLINE) was completed using the PubMed system. Because of the large amount of research completed in the last decade and a half, this literature review focused on published papers.

Selvaraj suggests that the key to improving access to medicines depends not only on high public expenditure on medicines but also on robust procurement and distribution system. Also, the availability of the most important class of drugs, namely, Antibiotics and Anti-pyretics was low at 40% in Bihar. [3]

Prescribing inappropriate alternatives, due to shortage of recommended anti-malarial drugs, was seen as a common practice in the healthcare facilities in Uganda and delayed procurement process was held responsible for the shortage of anti-malarial drugs. [4]

According to Nunan [5], national medicines policies, incorporating the principles of Essential Medicines, have improved drug availability and access. A large gap remains however, between policy frameworks and efficient, practical implementation.

According to WHO, one-third of the global population does not have regular access to essential medicines and in some of the lowest-income countries in Africa and Asia, more than half of the population has no regular access to essential medicines. [6]

Brightpearl [7] suggests that running an efficient and profitable business is all about sharing and using accurate information, usually through an integrated software system. Hospital staff should

know that the stock levels in the system are always up to date and accurate; this will place their trust in the software.

Andrew suggests that by applying the understanding of indicators such as inventory turnover and EOQ should result in optimal inventory levels which keep costs to a minimum while at the same time ensuring customer satisfaction. [8]

Maestre states that dispensary drugs should be in the safety stock in a tertiary hospital in accordance with the risk level and the number of days that the hospital is able to withstand a stockout. [9]

Good stock control practices require an adequate knowledge of the medicine requirements for a given locality. An under-stocked pharmacy cannot fulfill the needs of the community. Stock ordering relates to stock availability and stock demand.. These factors will vary depending on location and population. Therefore, regular monitoring and evaluation of stock levels ensures good stock management. [10]

CHAPTER 3 – RATIONALE

Drugs being expensive and resources limited, it becomes imperative to improve their supply, increase the use, and minimize the cost through a pharmaceutical management system to be effectively put in place. In the overall management of drugs, all essential drugs needed for health care should be available at all the times, at the health facilities and systems of procurement should be such that quality drugs are procured.

The consequences of stock-outs for patients are grave as patients might lose confidence in the health facility and loss of hospital revenue. The present study addresses this important issue of drug availability and aims at determining the occurrence in a tertiary care hospital. The rationale stemmed from the increasing need to promote patient satisfaction and drug availability. Therefore, assessing stock-outs and preventing revenue leakage.

CHAPTER 4 – OBJECTIVES

General:

- To evaluate the drug availability in OP Pharmacy.

Specific:

- To identify the reasons for unavailability of drugs.
- To evaluate the level of satisfaction / dissatisfaction of patients to unavailability of prescribed drugs.
- To assess the physician's prescribing patterns
- To suggest recommendations for further improvement in management of stocks.

CHAPTER 5 – METHODOLOGY

2.1 Study Area

The study was carried out in the OP Pharmacies of Max Super Specialty Hospital, Patparganj, New Delhi.

2.2 Study Duration

The study was carried out from 7th March, 2014 to 7th May, 2014.

2.3 Study Design

It was a Cross- Sectional & Observational Study.

2.4 Sampling

a) Method - Non-probability, Convenience sampling.
b) Size – 530 prescriptions a total of 2571 prescriptions during the study duration.
c) Unit – A patient's prescription.
d) Exclusion Criteria - Prescriptions of :
    - EWS patients.
    - Other Hospitals, Clinics, Physicians.

2.5 Data Collection

a) Type of Data:
    - Primary data was mainly obtained by observing the pharmacists in OP Pharmacy.
    - Some secondary data was collected by observing records in the HIS.

b) Technique: Technique adopted was Structured Observation.

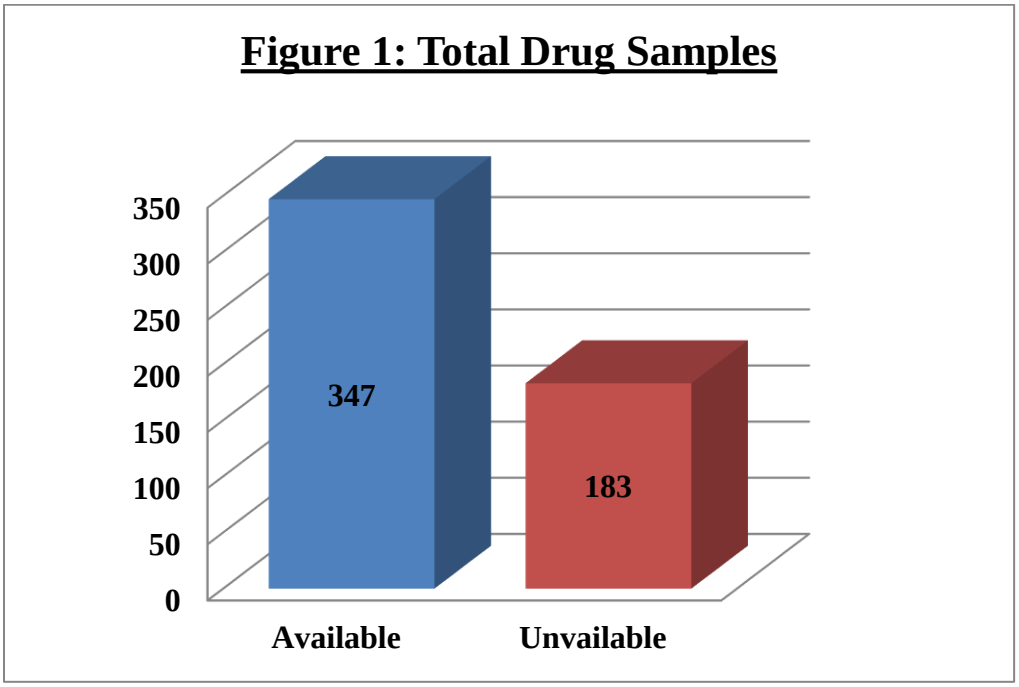
c) Tool: Tool used was an Observation Schedule.

2.6 Tools for Analysis

The Data so collected was fed into Microsoft Excel 2007, and the analysis was done using Excel 2007.

CHAPTER 6 – RESULTS AND FINDINGS

Figure 1 depicts that a total of 530 samples were taken, out of which in 347 samples of prescribed drugs were available in the pharmacy and 183 samples of prescribed drugs were un-available.



In Figure 2, the percentage of drug availability of the total 530 samples is shown.

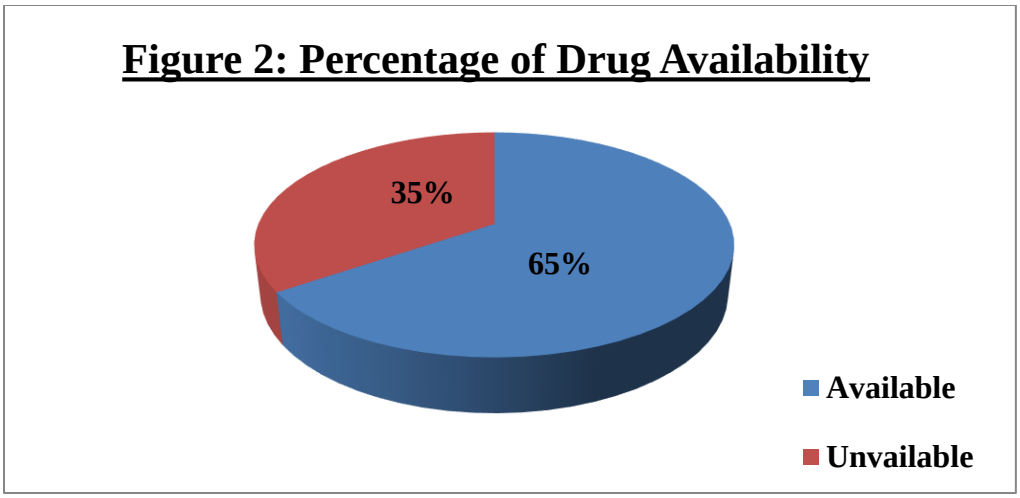


Figure 3 shows that out of 183 samples, in 107 cases substitutes were given and in 76 cases, even the substitute was unavailable.

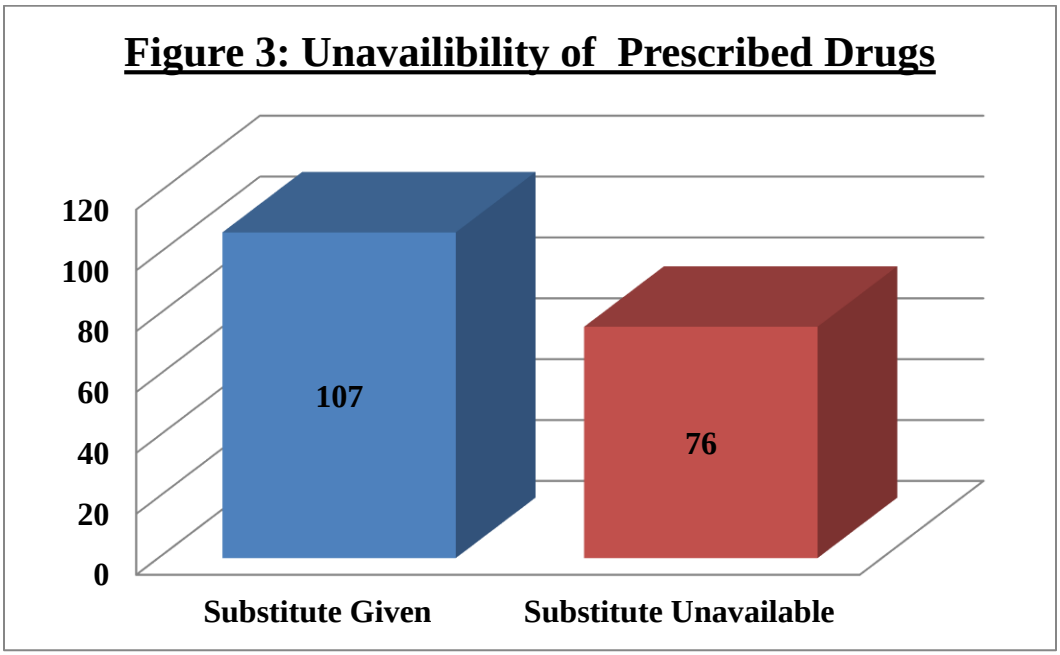
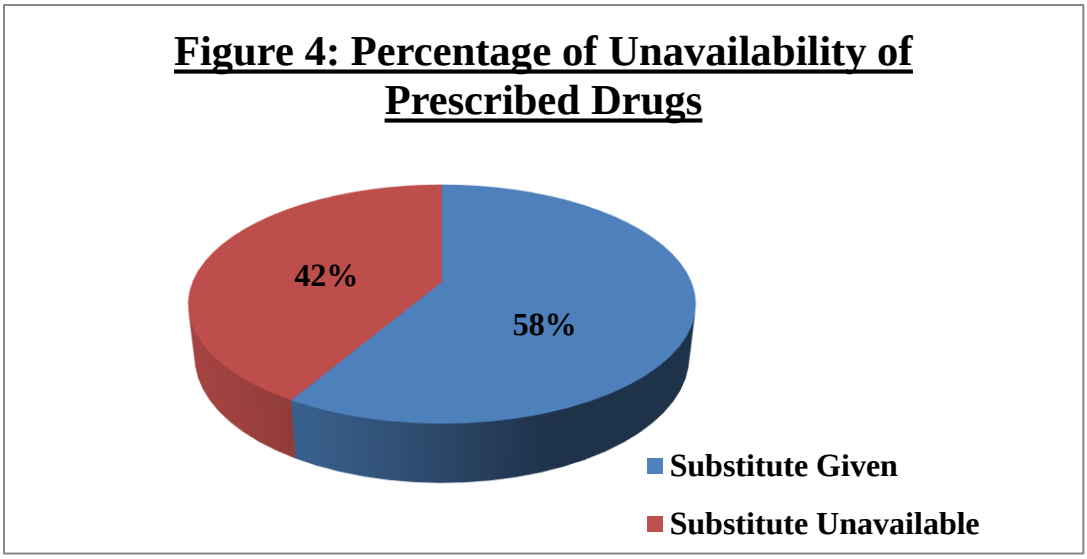


Figure 4, percentage-wise depiction of the samples, where substitute were given and where substitutes were unavailable. Therefore, 76 samples were not given any drug.



In Figure 5, the reason for 107 samples to be given a substitute is depicted suggested 59 cases of stock-outs and 48 cases of non-formulary drugs being prescribed.

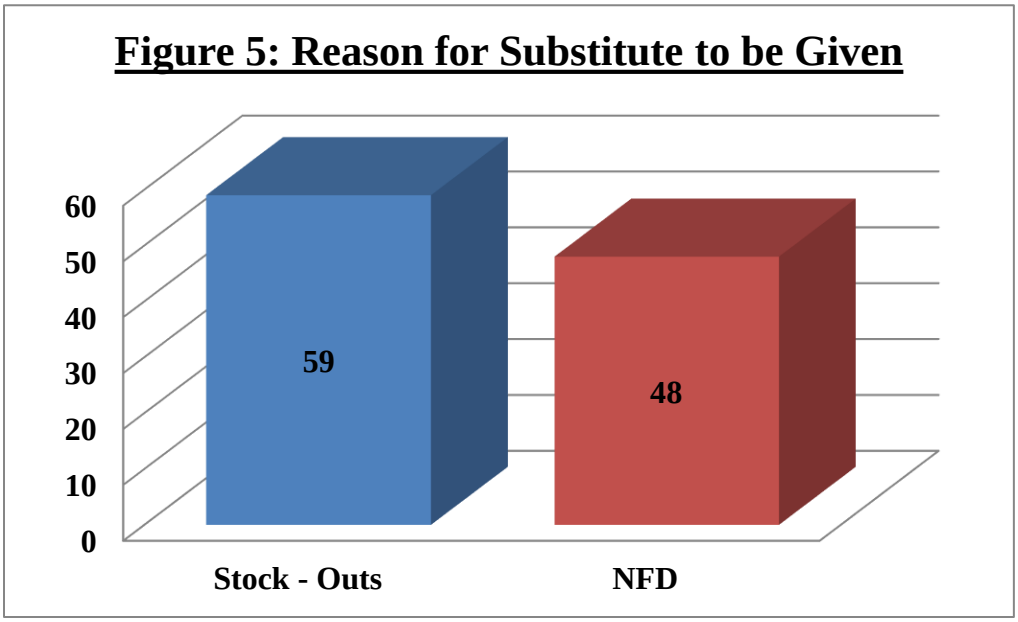


Figure 6 shows the main reason for which substitute is given is due to Stock-Outs. Therefore, suggesting a poor stock management system.

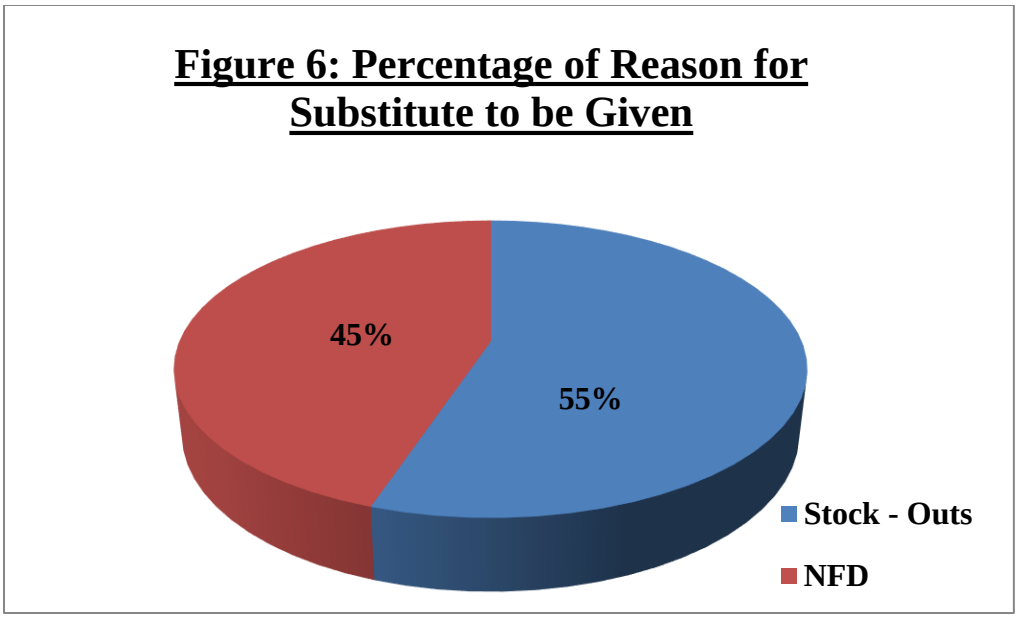
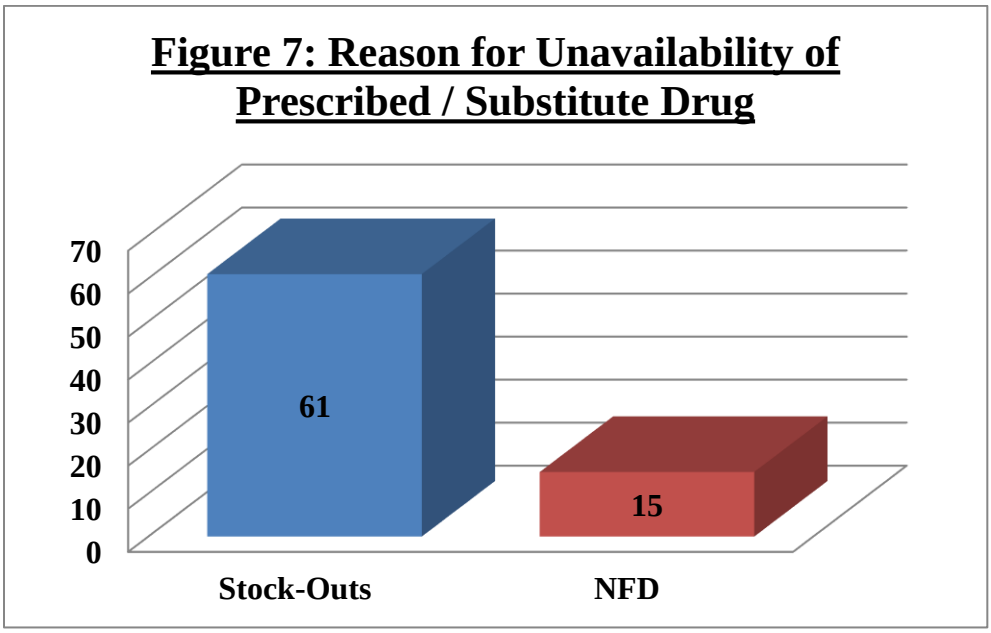


Figure 7 & 8; show the reason for which 76 samples were not given any drug. As depicted, 61 cases were due to Stock-Outs, contributing to 80% of 76 samples.



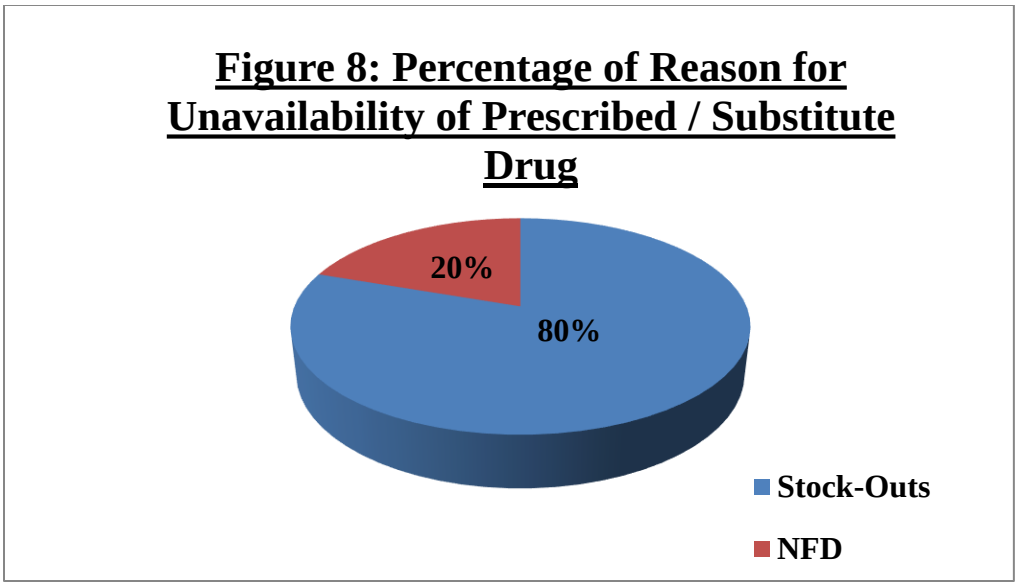
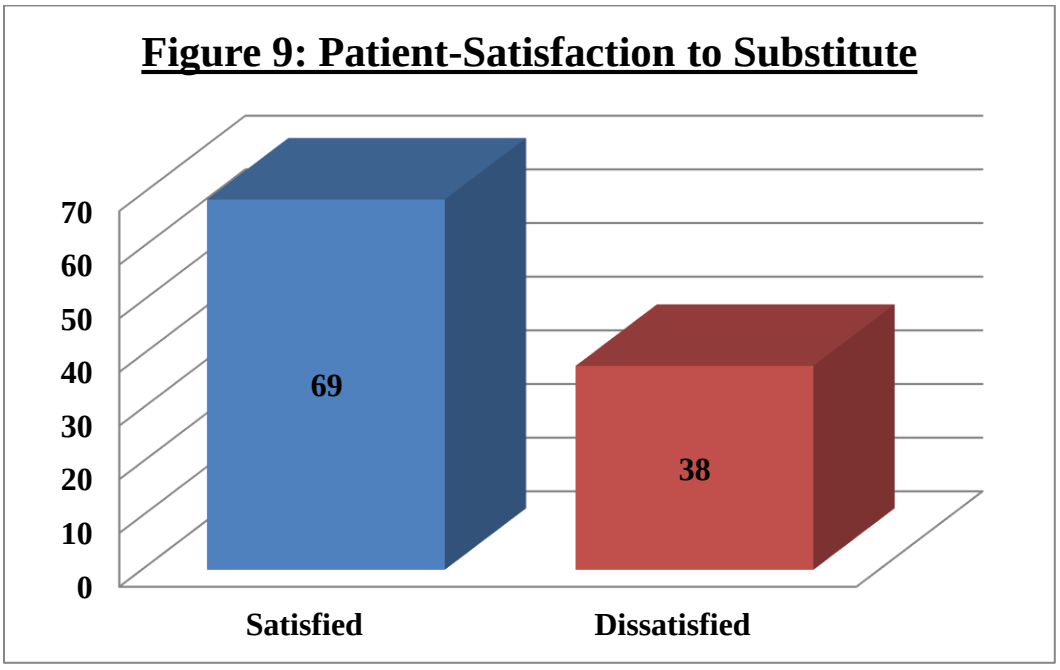
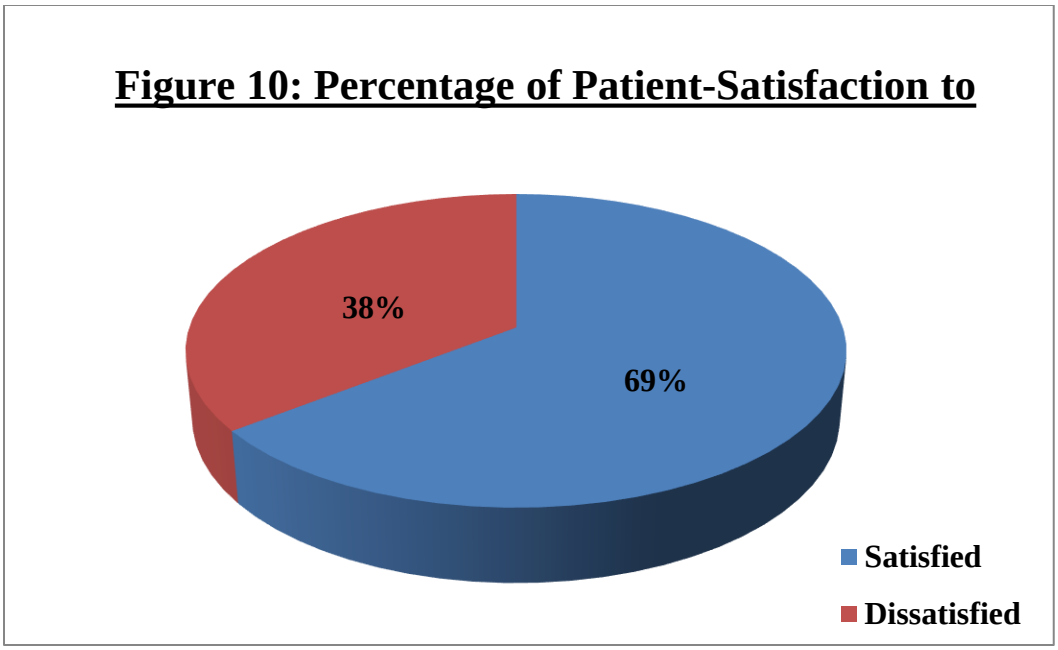


Figure 9 depicts the number of samples that were satisfied and dissatisfied with a substitute being given rather than the prescribed drug. 107 samples were given a substitute, out of which 38 were dissatisfied.



In Figure 10, 38 % of 107, were dissatisfied with a substitute.



In Figure 11, 76 cases were not given any drug and therefore, loss of revenue as well as high level of dissatisfaction was seen in 43 cases.

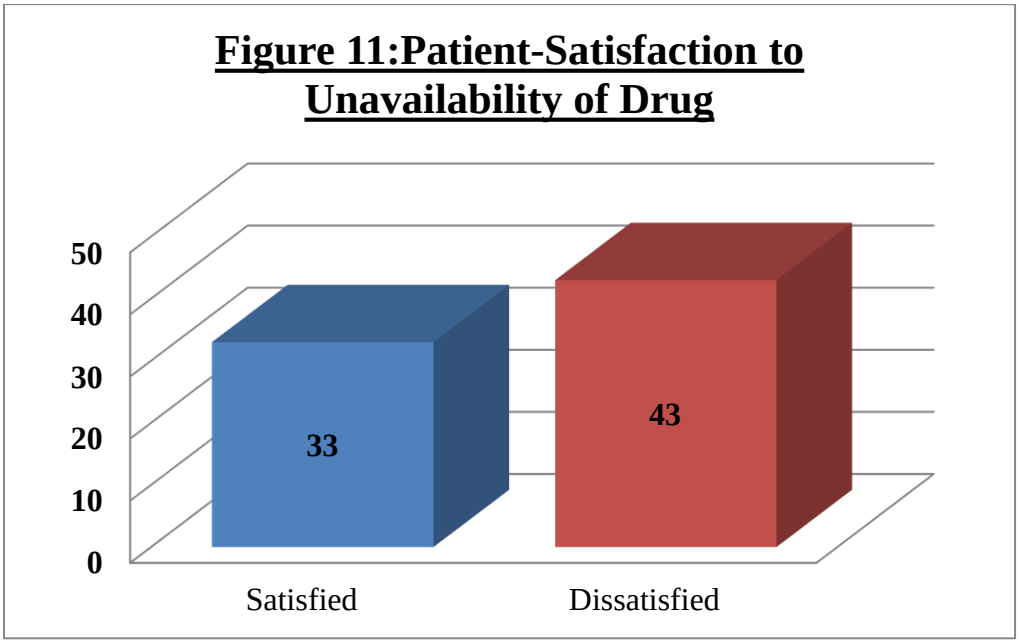
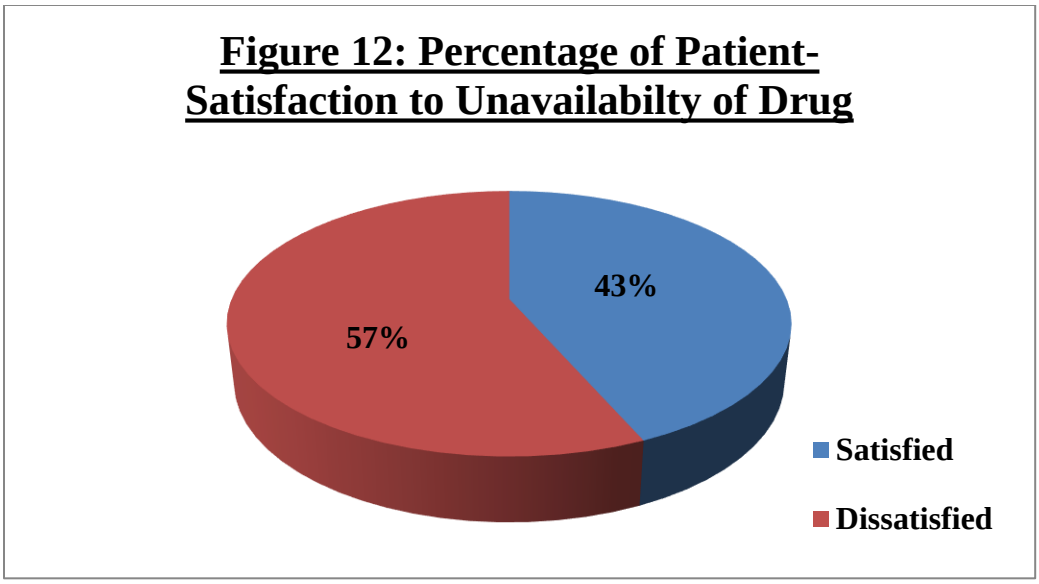


Figure 12, depicts the percentage of cases that were satisfied/dissatisfied to the unavailability of either prescribed/substitute drug. 57 % of 76 cases were highly dissatisfied.



CHAPTER 7 - DISCUSSION

A total of 530 samples were taken in this study, as a representative of the total prescriptions of 2571 that were made during the study duration. In 347 cases, the drug prescribed was available in the OP pharmacy. In 183 cases, the prescribed drug was not available; therefore, either the patient was given a substitute or was not given any drug. The later accounted to 76 cases of the 530 samples. In such cases, revenue was lost, therefore, being a point of revenue leakage to the organization.

Reasons for substitute drugs to be given to 107 cases, was mainly due to stock-outs and non-formulary drugs. Since in 55% cases, stock-out was seen, suggesting that the inventory controls and stock management was inadequate and could be strengthened further.

A level of dissatisfaction was seen in 38 cases of the 107 cases that were given substitute drugs, suggesting that 36 % cases preferred to be given prescribed drugs only.

In 76 cases, no drug was given, mainly due to drug stock-outs. This again indicates inadequate inventory control and stock-analysis. This should be considered by any organization as patient is dissatisfied as well as there is a loss of hospital revenue. A higher level of dissatisfaction was seen in 43 cases where no drug was given, accounting to 57% of patient dissatisfaction. Patient dissatisfaction is an important indicator of quality.

CHAPTER 8 - LIMITATIONS

The limitations of this study are as follows:

- Only Out-Patient Pharmacy was covered due to constraint of study duration.
- Cases of drug shortage in the market were not considered.
- Pharmacists arranged drugs as they were being observed.

CHAPTER 9 - RECOMMENDATION

The following recommendations were suggested after the study was completed:

- Indent Order to be done early in the morning and should be prompt.
- Early morning pop-ups of stock levels in HIS.
- New Physicians to be given Hospital Formulary and emphasis on Formulary Drugs.
- Staff to be trained on regular basis for Stock Management and Inventory Control Practices.
- Participatory forecasting
- Adequate buffer stock of essential medicines.
- Advocacy for 100% availability of medicines.

CHAPTER 10 - CONCLUSION

Drug shortages take a toll on hospitals and patients. Pharmacists are being pulled from taking care of patients so they can try to find the drugs their patients need. This can impact care as well as hospital resources, costing millions annually.

Health care professionals dealing with drug shortages also face the challenges of constant switching among different products and using unfamiliar drugs. For the most part, with judicious management of shortage medications and evidence-based use of alternative products, most patients have received the care they need. But for pharmacists, physicians, and the patients we take care of, this simply isn't good enough. It is frustrating and discouraging to no longer have many of the drugs that are basic to care.

Inefficiencies at any stage of the supply chain cause stock-outs and actions should be taken to eliminate stock-outs encourage transparency and accountability in the supply chain and monitoring of availability of medicines at the health facilities.

Unfortunately there are no easy short-term solutions for drug shortages and therefore, it requires various stakeholders to work together in order to provide patient care, patient satisfaction and loss of revenue. When a hospital pharmacy is leveraged to its full potential, it can become a key driver for achieving the organization's strategic agenda.

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