Study on Assessing the Effectiveness of Inventory Management in MMI Narayana Multispecialty Hospital (Raipur)

By

Kratika Rajawat

Dissertation submitted for the partial fulfillment of the

MBA Pharmaceutical Management

Academic year, 2017-2019

The IIHMR University, Jaipur

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IIHMR UNIVERSITY

TO WHOMSOEVER MAY CONCERN

This is to certify that ***Kratika Rajawat*** student of MBA Pharmaceutical Management from The IIHMR University, Jaipur has undergone Dissertation training at **MMI Narayana Multispecialty Hospital, Raipur** from 4th February to 3th May 2018.

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

The Internship is in fulfilment of the course requirements.

I wish him all success in all his future endeavours.

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Unit of Narayana Health

The certificate is awarded to

Kratika Rajawat

In recognition of having successfully completed her
Internship in the department of

SUPPLY CHAIN MANAGEMENT

and has successfully completed her Project on

A Study on Assessing Effectiveness of Inventory Management in MMI Narayana Multispeciality Hospital

Date- 04/MAY/2019

Organization- MMI Narayana Multispeciality Hospital, Raipur

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.

Head - Human Resource
Mr .Sankar Prasad Gouda

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NH MMI Narayana Multispeciality Hospital
(A Unit of Narayana Hrudayalaya Limited)
(Previously Narayana Hrudayalaya Pvt. Ltd.) CIN: L85110KA2000PLC027497
Registered Office: 258/A, Bommasandra Industrial Area, Anekal Taluk, Bangalore 560099
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CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **A Study on Assessing the Effectiveness of Inventory Management in MMI Narayana Multispecialty Hospital (Raipur)** and submitted by **Miss Kratika Rajawat,** Enrolment No –**0103,** under the supervision of **Dr. Saurabh Kumar** for award of MBA in Pharmaceutical Management of the University carried out during the period from **4th February, 2019** to **3rd May, 2019** 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.

Kratika
14/05/19

Signature

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Introduction-

Stock of the medication thing in the present situation is one of the significant current resources for the association. These are the significant way for the contribution of definite item. Stock is a zone where cost investment funds can be made. Stock choices are top hazard and top effect from the budgetary and fiscal perspective. "Stock, as present resource, varies from other current resources in light of the fact that just monetary chiefs are not included." Rather than the majority of the practical regions like, fund, promoting, creation, and acquiring are included." The significant activity of the money related director is to accommodate the clashing perspectives on the different useful territories with respect to the fitting stock dimensions so as to satisfy the general goal of augmenting the proprietor's riches." "Crude materials deficiencies can close down the assembling line or change a generation limit and its timetable, which, can presents included use and potential for completed merchandise deficiencies. "Deficiencies of the thing can upset arranged promoting and assembling activities, over supplied inventories additionally present issues. Overloads of thing can be prompts the addition in the expense and decrease the gainfulness of warehousing, working capital necessities, weakening, protection, duty and out of date quality."

Characteristics

- The holding of the drugs in the premises or the keeping of stock is exceedingly dangerous on account of the conjecture and the potential for out of date quality.
- Investments in the stock can't be utilized to acquire different products or resources and it can't be holding the equivalent, that could improve undertaking execution. "
- A fund can bolster the stock venture must get, expanding the association's advantage cost. The second type of hazard is the likelihood that the item will be stolen or become out of date.

Inventory Management Techniques

(1) ABC Analysis

ABC investigation of the things/merchandise is underlining a significant standard for example “Vital few: trivial many”. Measurements can demonstrate that the main bunch of things represent heft of the yearly consumption on materials. "These are a couple of things called A things subsequently hold the way to the business. Other things known as B and C things are various in number yet their inclusion is less critical to the business. ABC investigation will in general separate the things into three classes: A, B and C based on their yearly utilization.

A – Items: It is hard to find that 5-15% of things represent 70-80% of the absolute cash spent on materials. "These things require point by point and unbending control of their utilization example and should be loaded in littler amounts with the goal that the stock can keep up. These things are for the most part secured normally, the amount per event being low. This methodology goes into a contract with the makers and providers of these specific things and has their supply in stunned parcels as indicated by the necessities and generation program of the purchaser." However, it tends to be conceivable when the interest is unfaltering. On the other hand, the stock can be kept at least dimension by continuous requesting of these sort of things as per their need and utilization design.

B – Items: These items are commonly 30% everything being equal and speak to 15% of the all-out esteem/consumption on the materials. These are the halfway item. The control of these things need not be as definite and as unbending as connected to C things.

C – Items: There are various (upwards of 50-60% of the all-out things), "modest (speak to barely 5-10% of the all consumption on materials) and henceforth these are the inconsequential (don't require close control) things. The acquisition approach of any association for these things is actually the switch of A thing. C things can be obtained inconsistently and in adequate amounts." This empowers purchaser to profit value limits and decrease outstanding task at hand of the concerned divisions."

Leading ABC Analysis:

"To leading of ABC examination, following seven stages are important to pursue:

1.Enlist the rundown of things and gauge their yearly utilization (units) agreeing their requirements and continuous method of utilization.

2.Determine the unit cost (or cost) of everything to be requested.

3.Multiply every one of the things yearly utilization by its unit cost (or cost) to acquire its yearly utilization in rupees (yearly use).

4.Arrange the things in the diving request of their yearly use beginning with the most elevated yearly use down to the littlest example of their utilization.

5.Calculate the total esteem yearly use of the things and express equivalent to total utilization rates. Likewise, express the number of things into aggregate thing rates.

6.Graph combined utilization rates against aggregate thing rates and isolate of the things into A, B and C classes.

7.To separate the things into the A, B and C classes, initial couple of things which are contribute between 70-75% of all-out yearly utilization and it tends to be considered as A classification, next couple of things which are as one with A classification things isolated before contribute between 80-90% of yearly utilization and it very well may be considered as B classification, and leftover things can be taken as C classification."

VED Analysis

"VED examination speaks to the characterization of things dependent on their criticality and their utilization example of that specific thing. " "The investigation can arrange the things into three gatherings called Vital, Essential and Desirable. "Fundamental" class include those things for the need of which creation would come to stop. "Basic" bunch incorporates the things whose stock-outs esteem is exceptionally high and "Alluring" bunch involves things which don't cause any quick loss of generation or their stock-out to involve the least use of the things and cause minor disturbances for a brief term of time. "

VED investigation is done to recognize the basic things. "A thing, which utilization insightful has a place with C-classification, might be basic from generation perspective if its stock-out reason substantial creation misfortune in that recorded things."

A thing might be crucial for a number for the accompanying reasons, in particular: -

1.If the non-accessibility of the specific thing can make genuine generation misfortunes that firm or association.

2.Lead-time for the obtainment is extremely vast to present the things at their conveyance place.

3. It is a non-standard thing and is obtained to purchaser's plan to the sources.

4. The wellsprings of supply are the just one and are situated a long way from the purchaser's plant.

Steps engaged with making VED examination are as under:

1)Identify the factor to be considered for VED examination: This factor can be considered as an influence on generation limit (i.e stock-out expense in case of its non-accessibility), lead time and nature of a thing and wellsprings of supply. "

2)Categorization arrangement is readied, which can give the premise of the grouping of .things into the three class, for example, indispensable, fundamental and attractive classes. "Assess the things one by one against each factor and relegate focuses to the thing based on the degree of quality of the factor in the thing place the things into V, E and D classifications relying on focuses scored by the thing (table underneath) and premise of the order set under advance.

2. Literature Review

S. no.	Author name	Aim of study	Conclusion	Learnings
1	Ida Fitriana, Raden Gagak Donny Satria **Asian Journal of Animal and Veterinary Advances** **December, 2017**	This study aimed to analyze the annual medical materials expenditure and consumption using inventory control techniques.	The ABC-VED investigation can be received in medication stock of emergency clinic so it can design the accessibility of medications productively the nature of patient care.	Study Shows the essential guideline of stock control utilized ABC examination dependent on cost and VED examination on significance, that can be profitable for medication supply, stock control, improvement in patient consideration as well as in the ideal utilization of assets.
2.	SandeepB. Pund, Bina M. Kuril International Journal of Community Medicine and Public Health Year- 2016	objective of the study is to categorize the drugs based on cost and criticality aspects and identify those which require stringent managerial control.	Medications having a place with classification I which requires top administrative control, likewise the things having a place with classifications II and III which require control by center and lower administrative dimension respectively.	The drug inventory se stock investigation empowered the order of medications into classifications dependent on their need and task to proper administrative dimensions

S. no.	Author name	Aim of study	Conclusion	Learnings
3.	Hacer GünerGören	The aim of this study to determine the importance of drugs in a hospital's pharmacy via ABC, VED and ABC-VED Matrix Analyses	The rule focus of the examination is to analyze the stock organization control grasped and the convincing	we should diminish some imp factors like local purchase by using some new techniques of inventory management control techniques
4	Sefinew Migbaru	The objective of the study to assess pharmaceutical inventory management of Tikur Anbessa Specialized Hospital (TASH) for fiscal years 2009-2013	The outcomes demonstrate the requirement for routine utilization of logical pharmaceutical stock administration apparatuses, for example, ABC-VEN lattice examination to improve the proficiency of asset use and patient consideration.	Classification I pharmaceuticals took higher extent than Category II and III and a large portion of Category I pharmaceuticals were additionally Class A and V things that need extraordinary consideration of top administration for yearly spending and their accessibility.

5.	Geetha Mani , Kalaivani Annadurai	To categorise the drugs based on cost and criticality aspects and identify those which require stringent managerial control.	An efficient inventory management system at a primary health care level will contribute to provision of uncompromised patient care.	There is a need for adoption of such scientific techniques of inventory control at all levels of health care

3. OBJECTIVES

Objectives of the study

- To access the current status of Inventory Management.
- To apply appropriate Inventory control tools for Optimum Utilization of Inventory.
- To check whether the current inventory control tools are effective or not by comparing our results by other studies.

4. RESEARCH METHODOLOGY

Research Methodology

4.1 Research Design

- The study design used for this project is descriptive study.
- The data was closely observed and analysed.

4.2 Duration

This Study was carried out from 04th Feb to 3rd May 2019.

4.3 Study Content:

- All drugs at the Central store.
- All drugs at the sub store which cover OT pharmacy, OP pharmacy, IP pharmacy, Cath Lab pharmacy.

4.4 Data size:

- Central Stores = 1369 Drugs
- OT Pharmacy = 150 Drugs.
- OP Pharmacy = 1393 Drugs.
- IP Pharmacy = 1440 Drugs.
- Cath Lab Pharmacy = 57 Drugs.

4.5 Sampling Technique:

The sampling Technique selected was Purposive Sampling.

4.6 Data Collection

Information on all Drugs and Consumables of central store and sub store were taken from the system and mathematically calculated as A, B and C items.

Criticality of the items were analysed by doing the V, E, D analysis after interviewing the pharmacist of sub-stores and HOD of the main stores.

Information about the Drugs were taken from the Oracle & HINAI System of the Hospital. After observing the data it was analysed on Microsoft Excel.

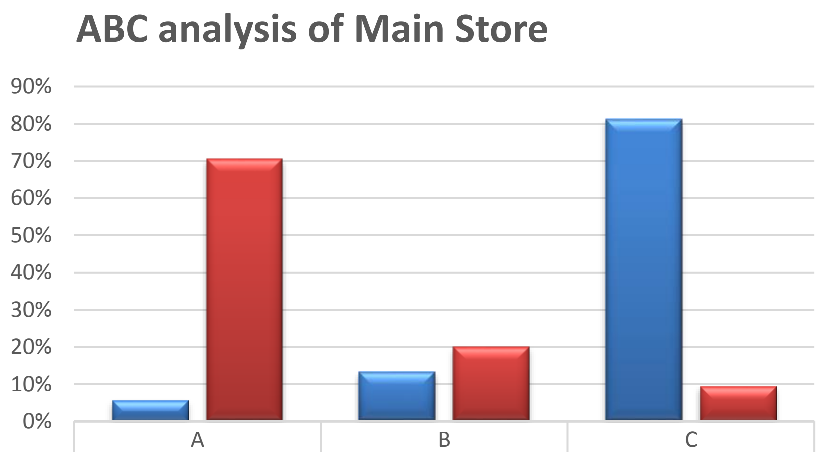
6. FINDINGS & ANALYSIS

Analysis: -

1. **Main Stores: -**

ABC Analysis

The total no of items under observation 1369 (4th Feb – 3rd May 2019)

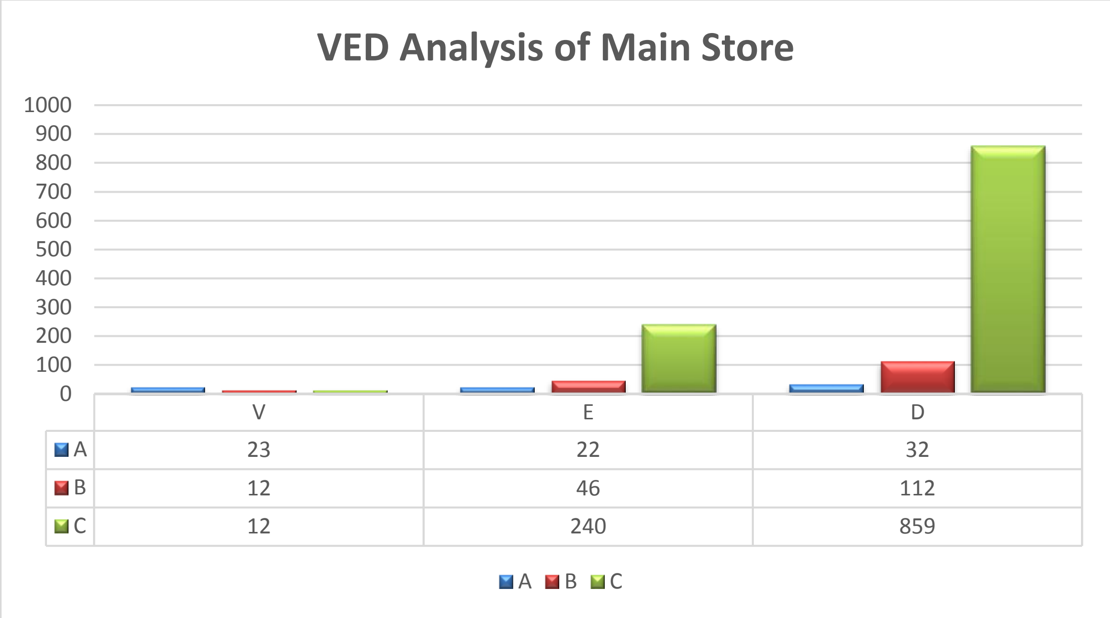


	A	B	C
% OF ITEMS	6%	13%	81%
% OF CONSUMPTION	71%	20%	9%

From above figure we can find out that out of total Drugs which were 1369 (4th Feb – 3rd May). The A items are 71 in numbers which constitutes about 71% of the total value of items. The B items were 181 in number which constituted about 20% of the total value of items. The C items were 1111 in number which constituted around 9% of the total value of items.

VED Analysis

The total items under observation were 1369 comprised of A and B items under study.

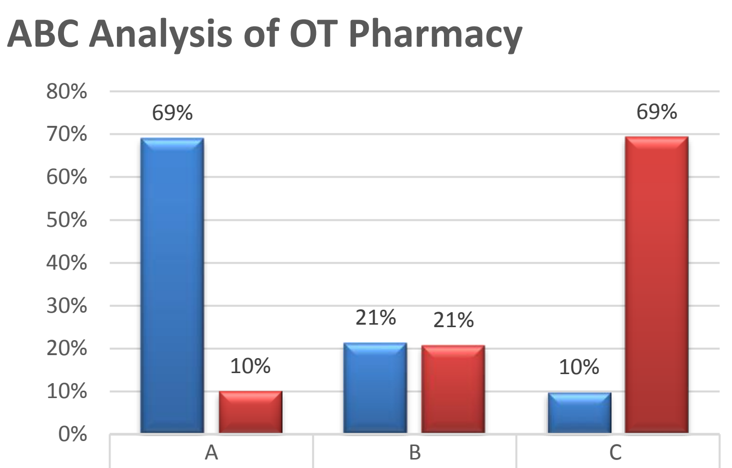


From above figure we can find out that out of the total sample size of 1369 items it was seen that there were 23 vital items,22 Essential Items and 32 Desirable items under “A” category , there were 13 vital items, 46 Essential Items and 122 Desirable items under “B” category and there were 12 vital items, 240 Essential Items and 859 Desirable items under “C” category.

2. OT Pharmacy

ABC analysis

The total no of items under observation = 150

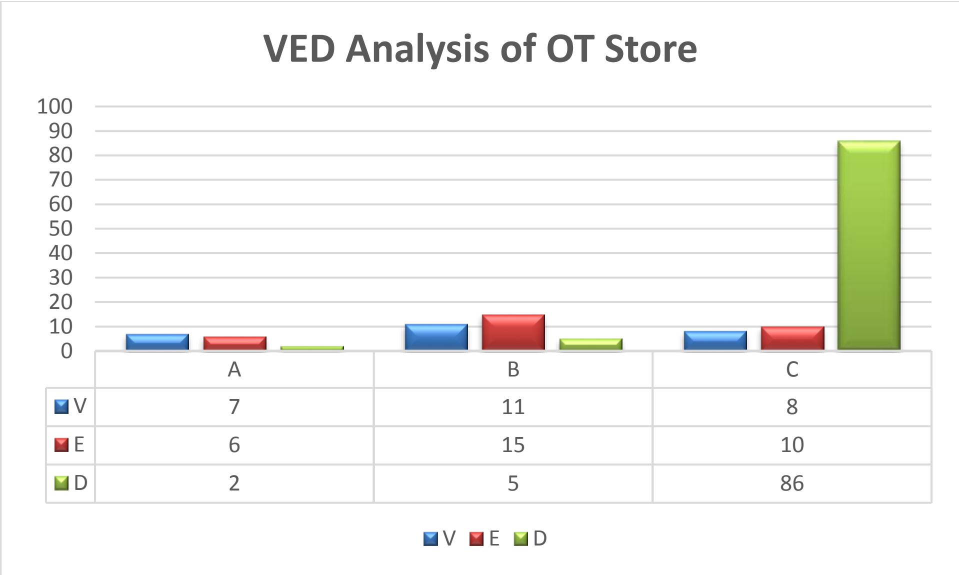


	A	B	C
Sum of CONSUMPTION %	69%	21%	10%
Count of Material Name	10%	21%	69%

From above figure we can find out that out of total Drugs which were 150 (4th Feb – 3rd May). The A items are 15 in numbers which constitutes about 69% of the total value of items. The B items were 31 in number which constituted about 21% of the total value of items. The C items were 104 in number which constituted around 10% of the total value of items.

VED Analysis

The total items under observation were 150 comprised of A, B and C items under study.

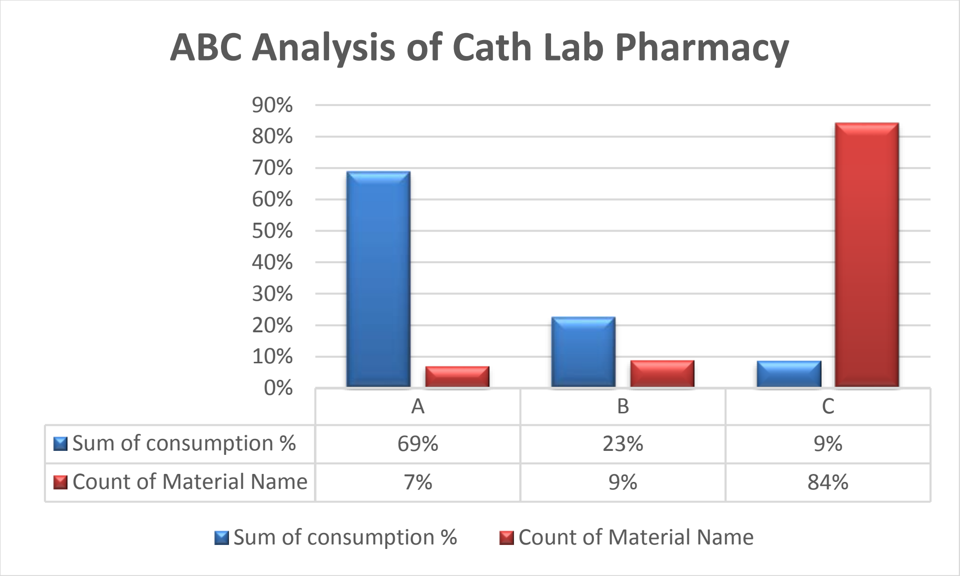


From above figure we can find out that out of the total sample size of 150 items it was seen that there were 7 vital items, 6 Essential Items and 2 Desirable items under “A” category, there were 11 vital items, 15 Essential Items and 5 Desirable items under “B” category and there were 8 vital items, 10 Essential Items and 86 Desirable items under “C” category.

3. Cath Lab Pharmacy

ABC analysis

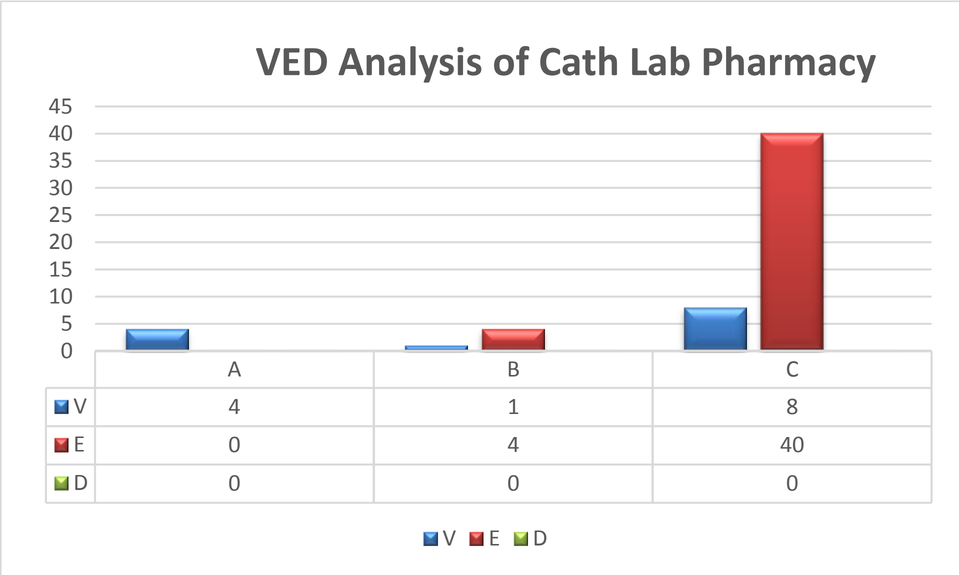
The total no of items under observation = 57



From above figure we can find out that out of total Drugs which were 57 (4^{th} Feb – 3^{rd} May). The A items are 4 in numbers which constitutes about 69% of the total value of items. The B items were 5 in number which constituted about 23% of the t total value of items. The C items were 48 in number which constituted around 9% of the total value of items.

VED Analysis

The total items under observation were 57 comprised of A, B and C items under study.

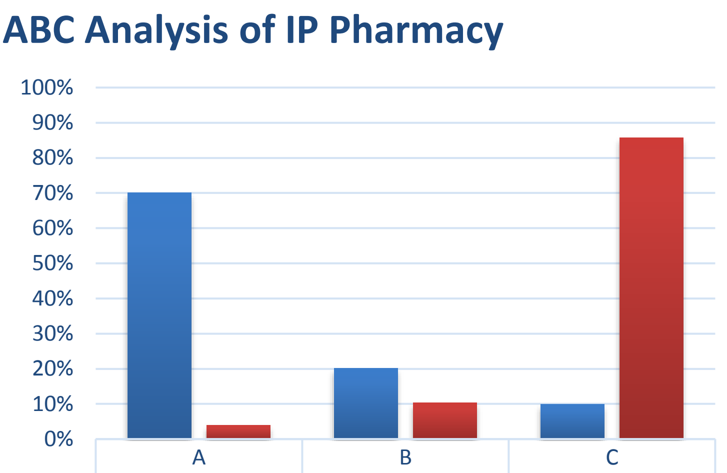


From above figure we can find out that out of the total sample size of 57 items it was seen that there were 4 vital items, 0 Essential Items and 0 Desirable items under "A" category, there were 1 vital items, 4 Essential Items and 0 Desirable items under "B" category and there were 8 vital items, 40 Essential Items and 0 Desirable items under "C" category.

4. IP Pharmacy

ABC analysis

The total no of items under observation = 1440

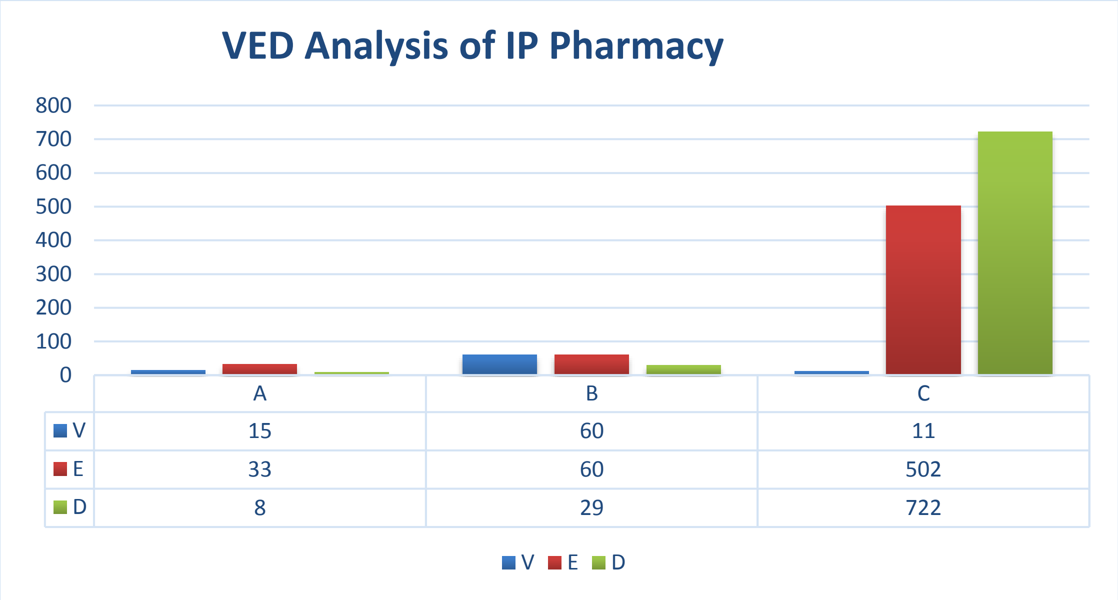


	A	B	C
Sum of CONSUMPTION %	70%	20%	10%
Count of Material Name	4%	10%	86%

From above figure we can find out that out of total Drugs which were 1440 (4th Feb – 3rd May). The A items are 56 in numbers which constitutes about 70% of the total value of items. The B items were 149 in number which constituted about 20% of the total value of items. The C items were 1235 in number which constituted around 10% of the total value of items.

VED Analysis

The total items under observation were 1440 comprised of A, B and C items under study.



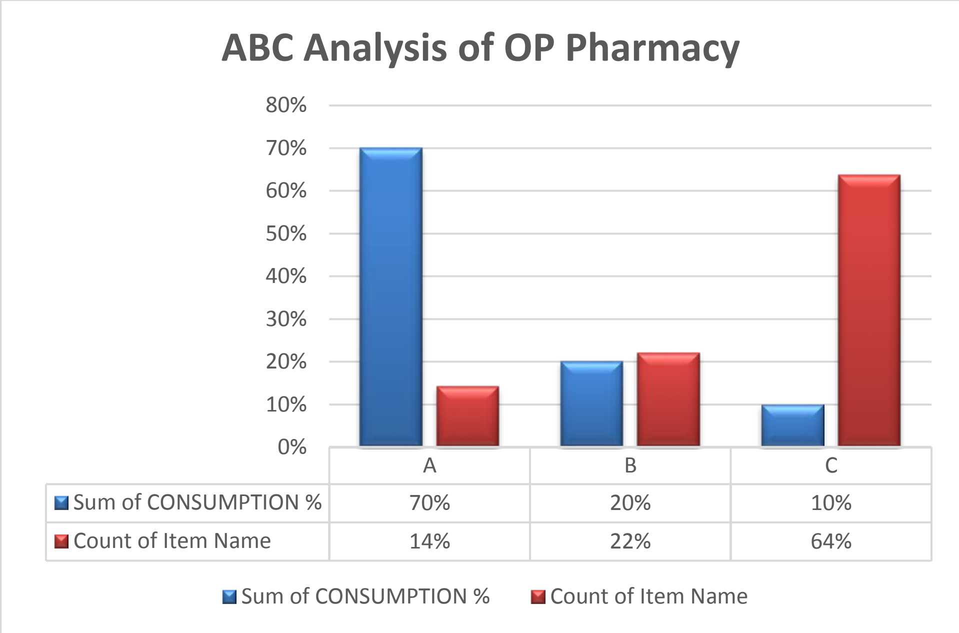
	A	B	C
V	15	60	11
E	33	60	502
D	8	29	722

From above figure we can find out that out of the total sample size of 1440 items it was seen that there were 15 vital items, 33 Essential Items and 8 Desirable items under "A" category, there were 60 vital items, 60 Essential Items and 29 Desirable items under "B" category and there were 11 vital items, 502 Essential Items and 722 Desirable items under "C" category.

5. OP Pharmacy

ABC analysis

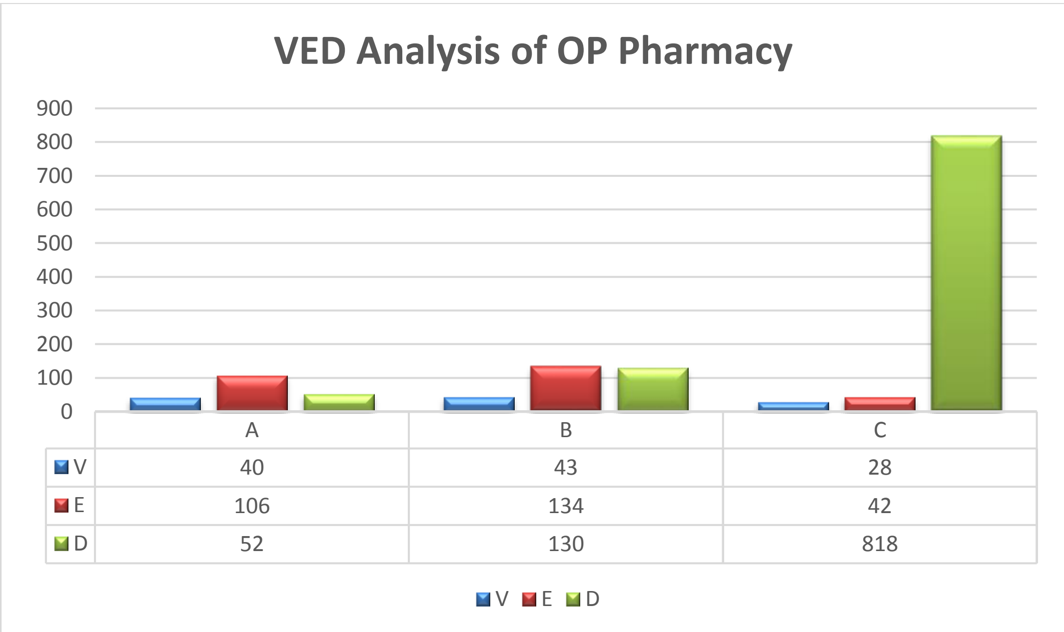
The total no of items under observation = 1393



From above figure we can find out that out of total Drugs which were 1393 (4th Feb – 3rd May). The A items are 198 in numbers which constitutes about 70% of the total value of items. The B items were 307 in number which constituted about 20% of the total value of items. The C items were 888 in number which constituted around 10% of the total value of items.

VED Analysis

The total items under observation were 1393 comprised of A and B items under study.



From above figure we can find out that out of the total sample size of 1393 items it was seen that there were 40 vital items, 106 Essential Items and 52 Desirable items under “A” category, there were 43 vital items, 134 Essential Items and 130 Desirable items under “B” category and there were 28 vital items, 42 Essential Items and 818 Desirable items under “C” category.

Overall Findings

- Consignment basic stocks are only present in cath lab hence it would cause no hindrance to the stock as they don’t carry any inventory holding cost.
- It was found that the drugs were merely arranged as per alphabetical order and the recording of the stocks was on random basis.
- There was categorization of items as ABC& VED analysis of central store only.
- Some drugs were sent back to the vendor after they expire so an account of near expiry drugs should be maintained.

7. CONCLUSION

MAIN STORE ABC VED MATRIX -

CETEGORY	CLASS	NO. OF ITEMS	% OF THE DRUG
I	AV+BV+CV+AE+AD	102	7.4
II	BE+CE+BD	408	29.8
III	CD	859	62.7
TOTAL		1369	100%

OT STORE ABC VED MATRIX -

CATEGORY	CLASS	NO. OF ITEMS	% OF THE DRUG
I	AV+BV+CV+AE+AD	34	22.6
II	BE+CE+BD	30	20
III	CD	86	57.3
TOTAL		150	100%

IP PHARMACY ABC VED MATRIX -

CATEGORY	CLASS	NO. OF ITEMS	% OF THE DRUG
I	AV+BV+CV+AE+AD	127	8.81
II	BE+CE+BD	591	41.04
III	CD	722	50
TOTAL		1440	100%

OP PHARMACY ABC VED MATRIX -

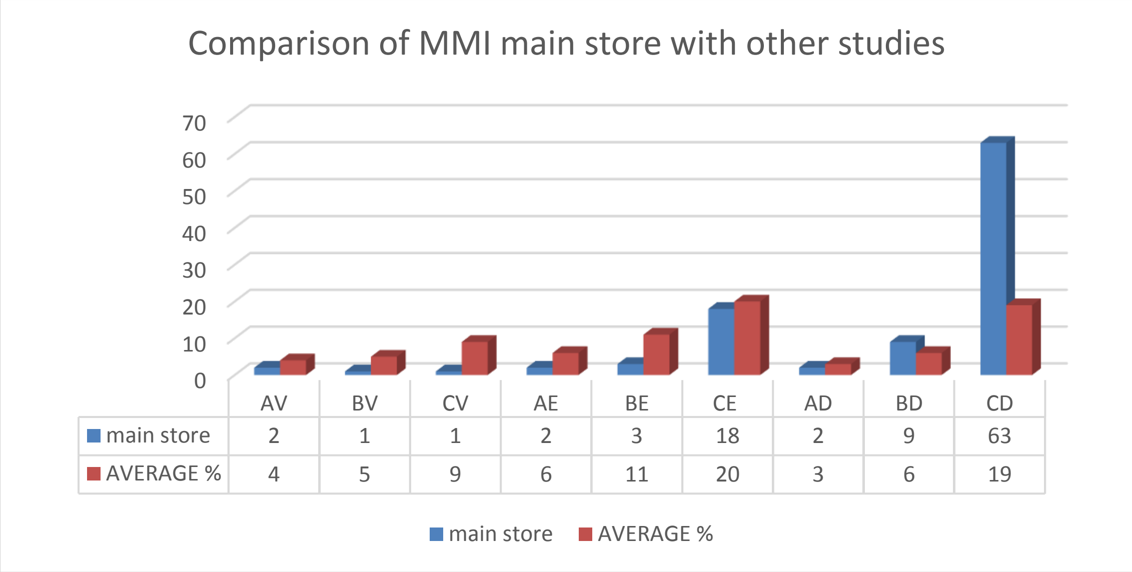
CATEGORY	CLASS	NO. OF ITEMS	% OF THE DRUG
I	AV+BV+CV+AE+AD	269	19.3
II	BE+CE+BD	306	21.9
III	CD	818	58
TOTAL		1393	100%

CATHLAB PHARMACY ABC VED MATRIX -

CATEGORY	CLASS	NO. OF ITEMS	% OF THE DRUG
I	AV+BV+CV+AE+AD	13	22.80
II	BE+CE+BD	44	77.1
III	CD	0	0
TOTAL		57	100%

Comparison from other studies-

Category of items	main store	tertiary care hospital	PGIMER	SKIMS	Average %
AV	2%	2%	4%	6%	4
BV	1%	2%	4%	10%	5
CV	1%	2%	4%	22%	9
AE	2%	4%	5%	10%	6
BE	3%	7%	17%	9%	11
CE	18%	18%	20%	22%	20
AD	2%	1%	4%	3%	3
BD	9%	2%	14%	3%	6
CD	63%	12%	28%	17%	19
TOTAL	1369	842	1535	105	



Percentage taken for comparison from-

1. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3021698/
2. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4297849/
3. https://www.scribd.com/document/396130774/ABC-AND-VED-ANALYSES-OF-FREE-DRUG-STORE-IN-DRUG-AND-PHARMACY-OF-SKIMS-A-TERTIARY-CARE-INSTITUTE-IN-JAMMU-AND-KASHMIR-INDIA]

Reduction in Inventory holding days was made as follow: -

- Central Store = 14 Days stock + 7 Days Safety Stock (For Vital items).
- Total 21 Days = 14 Days stock + 4 Days Safety Stock (For Essential items).
- Total 18 Days = 14 Days stock + 0 Days Safety Stock (For Desirable items).
- Total 14 Days
- OT pharmacy = Total 7 Days stock.
- IP pharmacy = Total 7 Days stock.
- OP pharmacy = Total 7 Days stock.
- Cath Lab pharmacy = Total 7 Days stock.

8. RECOMMENDATIONS

Recommendations:

1. From the study we observed that the procurement of CD category is more in main store, so it should be reduced to maintain the proper inventory and also for reduction of holding days.
2. The consignment basic stock should not be invoiced before consumption.
3. Re-order levels should be based on consumption on monthly basis.
4. First in first out method should be applied to prevent expiry of drugs.
5. The drugs were arranged as per ABC & VED of all the store as it leads to an organised form in which inventory can be controlled.
6. To sustain the initiative, it is important to supervise the system in monthly BRM meetings to keep a regular check on the stock status.

CATEGORY	SUGGESTIONS	Frequency of Purchase
I AV+BV+CV+AE+AD	Stores must make a very strict monitoring, tight level of control, and top level of management for Category I items	Most Frequent
II BE+CE+BD	Stores must make a strict monitoring, moderate level of control, and middle level of management for Category II items	Occasional
III CD	Store must make a moderate monitoring, low level of control, and middle level of management for Category III items	Infrequent

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