

## RESEARCH ARTICLE

### Always, better, and control-vital essential and desirable analysis of pharmacy store of tertiary care teaching hospital, Mumbai

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#### ABSTRACT

**Background:** Approximately 35.0% of annual hospitals budget is spent on buying materials and supplies, including medicines. This requires effective and efficient management of the medical stores. The primary purpose of a store is to receive, hold, and dispatch stock and to manage stock and ensure the smooth flow of goods by determining what, how much, and when to order stock. **Aim and Objective:** To analyze Always, Better, and Control-Vital Essential and Desirable (ABC-VED) matrix of the pharmacy store of tertiary care teaching hospital, Mumbai. **Materials and Methods:** ABC analysis based on cost and VED analysis based on criticality of items in drug store was done for the year of 2018–2019. ABC-VED matrix analysis was done and items were categorized in Category I, II, and III. **Results:** The drug store consisted of 313 items out of which 14.37%, 21.40%, and 10.03% of items belong to category A, B, and C, respectively, and spending 69.89%, 20.06%, and 10.03% of total budget. About 24.28%, 52.17%, and 23.00% items belong to category V, E, and D, respectively, and spending 14.78%, 60.34%, and 24.87% of total budget. ABC-VED matrix analysis showed that 36.10%, 49.20%, and 14.69% items belong to category I, II, and III, respectively, spending 77.42%, 20.37%, and 2.19% of total budget. **Conclusion:** Category I items require upmost level of management. Category II items require top-/middle-level management and category III requires lower level management.


**KEY WORDS:** Always, Better, and Control Analysis; Vital Essential and Desirable Analysis; Always, Better, and Control-Vital Essential and Desirable Matrix; Pharmacy Store

#### INTRODUCTION

Pharmacy is one of such centers of a health facility, where a large amount of money is spent on purchases on a recurring basis. Many a time drugs go out of stock and expire before its use. Absence of or lack of sufficient drugs in pharmacy may lead to poor health-care delivery and bad reputation. Thus, the

need for planning, designing, and organizing the pharmacy in a manner that results in efficient clinical and administrative services becomes more pertinent in this situation. Approximately 35% of annual hospitals budget is spent on buying materials and supplies, including medicines.<sup>[1]</sup> This requires effective and efficient management of the medical stores, efficient priority setting, decision-making in purchase and distribution of specific drugs, and close supervision on drugs belonging to important categories.<sup>[2]</sup>

Medical stores management should assist both the flow and reliability of supplies from source to user as economically and reliably as possible, and without significant wastage or loss of quality. The primary purpose of a store is to receive, hold, and dispatch stock. This materials management process

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is implemented through inventory control and warehouse management systems, which may be manual or computer based. The other purpose of inventory control is to manage stock and ensure the smooth flow of goods by determining what, how much, and when to order stock.<sup>[3]</sup> Inventory control is a scientific system which indicates as to what to order, when to order, and how much to order and how much to stock so that purchasing costs and storing costs are kept as low as possible.<sup>[4]</sup>

There are various techniques in inventory control

- Always better control (ABC) analysis
- Vital, essential, desirable (VED) analysis
- High, medium, low analysis
- Fast, slow moving, and non-moving analysis
- Scarce, difficult, easy analysis.<sup>[4]</sup>

Out of these methods two are commonly use – ABC and VED.<sup>[5]</sup> ABC analysis is the analysis of the store items based on cost criteria and VED analysis is based on their criticality. It is possible to conduct a two-dimensional analysis taking into consideration cost on one hand, that is, A, B, and C categories and criticality on the other hand, that is, V, E, and D categories. Findings of ABC and VED analysis can be coupled and further grouping can be done to evolve a priority system of management of stores.

- A-items constitute only 10% of all inventory items. They must be under strict control of higher management as they consume the top 70–80% of the total inventory consumption value of the company
- B-items are the interclass items which include 20% of total inventory items. They require moderate control by middle management since they consume 20% of annual consumption value, on the contrary
- C-items need control by lower management, account for 70% of total inventory items, and consume 10% of the annual consumption value<sup>[6]</sup>
- Vital includes the items without which hospital services and patient care are seriously hampered
- Essential includes those without which hospital services cannot run beyond a week and patient care is adversely affected
- Desirable includes items without which patient care would not adversely affect.<sup>[7]</sup>

The ABC model works in a manner as to get prime attention to the important items and not have unnecessary attention be spent on the not so important items. This prioritization of attention and focus is vital to keep the costs in check and under control in the supply chain system. VED analysis is based on need of the items at hospitals. According to it, items are classified into three categories: Vital, essential, and desirable.

### ABC-VED Matrix Analysis

ABC-VED matrix provides more meaningful control over the material supplies and divides items into three main categories:

Category I, Category II, and Category III. Category I items are vital and expensive and consists of subcategories (AV, BV, CV, AE, and AD) and need control by top of management. Category II includes essential with low-cost items (BE, CE, and BD). Category III includes desirable with least cost items (CD).<sup>[6,7]</sup>

Health care should be given utmost priority in current world. It is very important to utilize available funds as economically as possible and rational utilization of resources to provide quality health care in all organizations including hospitals. A balance should be made between expenditure on drugs and demands of medicines in a hospital setup which can be provided by following recommendations of drug inventory analysis from time to time. Therefore, in the present study, ABC, VED, and ABC-VED matrix analysis of the pharmacy store of Mumbai was performed to identify the categories of drugs which need proper management control. The specific objectives of this study were to analyze the annual consumption of items of pharmacy and expenditure incurred on them for the year 2018–2019, maintain a priority system based on ABC and VED and ABC-VED matrix analysis, and identify the item categories requiring greater supervisory monitoring. This was necessary to do as it would help in improving the quality of health-care services being delivered at lesser inventory and would help to reduce stock outs of some important drugs.

## MATERIALS AND METHODS

### Study Design

This was a single centric, retrospective, observational study.

### Study Site

Pharmacy store and department of pharmacology of tertiary care hospital of Mumbai.

### Sample Size

A total of 313 drugs purchased in the year of 2018–2019 were analyzed.

### Ethical Approval

Permissions from drug store in-charge and Institutional Ethics Committee were obtained before the study.

### Study Procedure

This study was conducted in the drug store of Grant Government Medical College and Sir JJ Group of Hospitals, Mumbai. A list of total 313 drugs purchased by the drug store in the year of 2018–2019, their cost per item, total number of items consumed of all the drugs, and their total cost was

obtained from pharmacy database. Annual expenditure of each drug was calculated by multiplying the cost per item to annual consumption. Annual drug expenditure (ADE) values were arranged in declining order of INR. The collective cost of all items was calculated. Data were subjected to ABC analysis, VED analysis, and ABC-VED matrix analysis.

**Ethical Approval**

Permissions from drug store in-charge and Institutional Ethics Committee were obtained before the study.

**RESULTS**

In our study, ABC analysis [Table 1] showed that out of 313 items; 45 items (14.37%) in category A consume 69.89%, 67 (21.40%) items in category B consume 20.06%, and 201 (64.21%) items in category C consume 10.03% of total budget. VED analysis [Table 2] showed, out of 313, 76 items (24.28%) belong to class V and consume 14.78%, 165 items (52.71%) belong to class E and consume 60.34%, and 72 items (23%) belong to class D and consume 24.87% of total annual budget. ABC-VED matrix analysis [Table 3] revealed that subclass AV consists of 8 items (2.55%) and costs 7.25%, subclass BV consists of 19 items (6.07%) and costs 5.30%, and subclass CV consists of 49 items (15.65%) and costs

2.22% of total budget [Table 4]. Subclass AE consists of 26 items (8.30%) and costs 45.32, subclass BE consists of 33 items (10.54%) and costs 9.40, and subclass CE consists of 106 items (33.86%) and costs 5.61 of total budget [Table 5]. Subclass AD consists of 11 items (3.51%) and costs 17.32%, subclass BD consists of 15 items (4.79%) and costs 5.35%, and subclass CD consists of 46 items (14.69%) and costs 2.19% of total budget. Category wise distribution showed [Table 6] category I (AV, BV, CV, AE, and AD) consists of 113 items (36.10%) and costs 77.42%, category II (BE, CE, BD) consists of 154 items (49.20%) and costs 20.37%, and category III (CD) consists of 46 items (14.69%) and costs 2.19% of total budget.

**DISCUSSION**

In this study, it was found that the category I consists of 36.10% of the items and 77.42% of annual budget was spent. Unavailability of these items is not acceptable as it includes items from category V and category E and is high priority. Strict topmost management control must be there for category I items. Stringent monitoring of usage and stock of these items should be done.

Considering their high cost; low buffer stock should be kept in handy. Category II includes 49.40% which is the major portion

**Table 1: ABC analysis (n=313)**

Category	No. of drugs	% of drugs	ADE* (INR)	ADE %
A	45	14.37	97,219,432	69.89
B	67	21.40	27,907,293	20.06
C	201	64.21	13,957,409	10.03
Total	313		139,084,134	

\*ADE: Annual drug expenditure, ABC: Always, better, and control

**Table 2: VED analysis (n=313)**

Category	No. drugs	% of drugs	ADE*(INR)	ADE %
V	76	24.28	20,560,969	14.78
E	165	52.71	83,930,376	60.34
D	72	23.00	34,592,789	24.87
Total	313		139,084,134	

\*ADE: Annual drug expenditure, VED: Vital, essential, and desirable

**Table 3: ABC-VED analysis (V)**

ABC analysis	VED analysis (V)			ADE %	
	No. of drugs	% of drugs	ADE* (INR)		
A	AV	8	2.55	10,091,530	7.25
B	BV	19	6.07	7,376,645	5.30
C	CV	49	15.65	3,092,792	2.22

\*ADE: Annual drug expenditure, ABC-VED: Always, better, and control-vital, essential, desirable

**Table 4: ABC-VED analysis (E)**

ABC analysis	VED analysis (E)			ADE %	
	No. of drugs	% of drugs	ADE*(INR)		
A	AE	26	8.30	63,036,652	45.32
B	BE	33	10.54	13,080,525	9.40
C	CE	106	33.86	7,813,199	5.61

\*ADE: Annual drug expenditure, ABC-VED: Always, better, and control-vital, essential, desirable

**Table 5: ABC-VED analysis (D)**

ABC analysis	VED analysis (D)			ADE %	
	No. of drugs	% of drugs	ADE*(INR)		
A	AD	11	3.51	24,091,249	17.32
B	BD	15	4.79	7,450,122	5.35
C	CD	46	14.69	3,051,417	2.19

\*ADE: Annual drug expenditure, ABC-VED: Always, better, and control-vital, essential, desirable

**Table 6: Distribution of drugs according to categories**

Category	No. of drugs	% of drugs	ADE*(INR)	ADE %
Category I	AV+BV+CV+AE+AD (8+19+49+26+11)	36.10	107,688,868	77.42
Category II	BE+CE+BD (33+106+15)	49.20	28,343,846	20.37
Category III	CD (46)	14.69	3,051,417	2.19

\*ADE: Annual drug expenditure

**Table 7:** Comparison of ABC, VED, and ABC-VED matrix analysis of different studies in India

Category	Present study	Devnani <i>et al.</i> <sup>[8]</sup>	Pund <i>et al.</i> <sup>[9]</sup>	Singh <i>et al.</i> <sup>[10]</sup>	Dudhgaonkar <i>et al.</i> <sup>[7]</sup>
A	14.37	13.78	16.8	11.23	14.51
B	21.40	21.85	21.8	24.60	16.94
C	64.21	64.37	61.4	75.4	68.55
V	24.28	12.11	35.3	12.30	54.03
E	52.71	59.38	50.4	61.5	30.65
D	23.00	28.51	14.3	26.2	15.32
Category I	36.10	22.09	47.9	21.38	55.65
Category II	49.20	54.63	43.7	58.27	30.65
Category III	14.69	23.28	8.4	20.32	13.70

ABC-VED: Always, better, and control-vital, essential, desirable

of the items and 20.37% of ADE was spent. Unavailability of these items can be tolerated for short period of time. This category requires top-/middle-level management. Category III includes 14.69% of the items; 2.19% ADE was spent. Unavailability of these items will not adversely cripple the patient care. This category requires lower level management.

As shown in Table 7, a similar study carried out by Devnani *et al.*<sup>[8]</sup> and Singh *et al.*<sup>[10]</sup> it was found that category I consists of 22.09% and 21.38% of the items, respectively, which was on lower side compare to the present study while other studies carried out by Pund *et al.*<sup>[9]</sup> and Dudhgaonkar *et al.*<sup>[7]</sup> Category I consists of 47.9% and 55.65% of the items, respectively, which was found to be on higher side compare to the present study. When we compared category III items with same studies, it was found that category III items were on higher side in a study carried out by Devnani *et al.*<sup>[8]</sup> and Singh *et al.*<sup>[10]</sup> and it was on lower side in a study carried out by Pund *et al.*<sup>[9]</sup> and Dudhgaonkar *et al.*<sup>[7]</sup> compare to the present study [Table 5].

Strength of the study: Drug store management is an essential factor for any health-care center as the great part of the hospital budget is spent on procuring drugs, medicines, and other items which are crucial for efficient patient care. Vital and essential items can be different for different hospitals and according to it the stock should be maintained. ABC-VED analysis helps us to know about the medicines which require more stringent monitoring and management. Furthermore, it cuts extra money to be spent on purchase of medicines which are less needed. Ultimately, it helps to better use of available resources and budget and to avoid out of stock situation at the drug store without compromising patient health care.

Limitations of the study: ABC analysis is based only on monetary value and the rate of consumption of the item. In a hospital, an item of low monetary value and consumption may be very vital or even lifesaving. Their importance cannot be overlooked simply because they do not appear in category A.

## CONCLUSION

Category I items require upmost level of management as these are necessary so that a patient can get best possible care in the hospital. These should be always available and should never be out of stock. Category II items require top-/middle-level management and category III requires lower level management. The ADE in the year of 2018–2019 was INR 139,084,134. This entails implementation of proper inventory control method for the management of the drug store, to prioritize the purchase of items, to make patient-hospital relationship better, to use the budget in well-organized manner, and to avoid the drugs from being out of the stock.

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