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ABC-VED analysis of the pharmacy of an urban health centre

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Abstract
Efficient pharmacy management involves ensuring that the right drug is purchased at the right time and in the right amount. ABC-VED analysis is an effective method for drug inventory control. It helps to identify drugs requiring stringent control and also in identifying drugs whose purchase can be avoided.

The list of drugs, their annual consumption and the unit cost of the drugs were obtained from the pharmacist of the tertiary care hospital to which the UHC was attached. VED analysis was done in consultation with the clinicians and the centre in charge.

A total of 145 drugs were analysed. The Annual Drug Expenditure [ADE] was Rs.10, 58,046. The percentage of drugs in Category A, B and C were 15.2%, 23.4% and 61.4% respectively. About 3% of drugs were 'Vital', 59% were 'Essential' and 38% were 'Desirable'. On further analysis it was observed that 19% of drugs [Category I] consumed 69% of the total ADE, requiring stringent management, 58% of drugs (Category II) consumed 27% ADE and 23% of drugs (Category III) consumed nearly 3% of the total ADE.

Any organization would need a well-managed inventory control to reduce extra costs due to wastages. ABC-VED analysis is one such effective method for drug inventory control.

Keywords: ABC-VED analysis, drug inventory, pharmacy management

1. Introduction

With the advent of advanced medical technology and drugs, the expenditure on health care delivery is increasing disproportionately as compared to the resources available [1]. Approximately 35% of the annual hospital's budget is spent on buying materials including supplies. The drugs consume approximately 60% of total consumable budget [7]. Thus pharmacy is one of the most extensively used therapeutic facilities of the hospital and one of the few areas where a large amount of money is spent on buying items [2].

Ensuring adequate stock of all the required items, especially the drugs, is one of the most important things for running a healthcare organization. This necessitates the effective and efficient inventory management of pharmacy store by keeping a close supervision on important drugs, prevention of pilferage and priority setting in purchase and distribution of drugs. This is more important in an Urban Health Centre as large numbers of patients, especially the urban poor, depend on it for their healthcare needs. A study suggested that review for expensive drugs could bring out 20% savings in pharmacy store budget. Hence, the essentiality of inventory management is emphasized [3].

The overall goal of an inventory management is to have what is needed, and to minimize the number of times one is out of stock [5]. ABC-VED analysis is one of the commonly used pharmacy inventory management tool. For ABC analysis, the pharmacy items are classified into three, on the basis of the costs. The first 10-15% of the items account for approximately 70% of cumulative cost [category A]; next 20-25% items are category B items, accounting for a further 20% of the cumulative cost and the remaining 65-70% are category C items, amounting for a mere 10% of the total value [2].

VED analysis is a method of classifying items according to their relative importance. It is also known as "separating the vital few from the trivial many". "V" is for vital lifesaving drugs, the stock outs of which cannot be accepted, "E" for essential drugs, without which a hospital can function for but may affect the quality of the services and "D" for desirable items, unavailability of which will not interfere with the functioning of the hospital [6].

The current study was conducted in the drug store of the Urban Health Centre (UHC), located in an urban slum area and attached to the Department of Community Medicine of a Medical College in Mumbai. The Centre provided primary health care through its general outpatient department (OPD), immunization and maternal and child health (MCH) services in its field practice areas. Besides, it also offered speciality services in Psychiatry, Dermatology and RNTCP. The drug store of the department was headed by a faculty member and managed by a pharmacist of the department. The pharmacies in the Centre were received from the Medical College to which the UHTC was attached to.

The field practice area often faced multiple issues related to inventory control, such as stock-outs of some essential drugs, expiry of the drugs and a number of local purchases. Employing drug inventory control techniques such as ABC-VED analysis, would help to improve the quality of health care services being delivered at lesser inventory and would

also reduce stock outs of important drugs.

2. Aims and objectives of the study

2.1 AIM

To evaluate the drug usage and identify the categories of drugs which need stringent management control in an urban health Centre [UHC] using the ABC and VED analysis?

2.2 Objectives

1. To perform need-based analysis of the drugs in the pharmacy of the UHC
2. To perform utility-based analysis of the drugs in the pharmacy of the UHC
3. To suggest recommendations ways to improve the drug inventory and utilization management based on the study findings.

3. Research methodology

Study area: Pharmacy of an Urban Health Centre [UHC] attached to a Tertiary Medical College
Study period: 2 months
Type of study: Operational research
Inclusion criteria and exclusion criteria: No specific inclusion and exclusion criteria. All drugs consumed in the UHC were taken for further analysis

Research procedure

The approval of institutional head was sought prior to carrying out the study. The names of all the drugs along with their amounts consumed at the UHC in the previous calendar year were obtained from the pharmacist of the UHC. The unit cost of these drugs was obtained from the chief pharmacist of the Tertiary Medical College, to which the UHC was attached.
For ABC analysis, the drugs accounting for about 70% of the costs were included in category A. Similarly, category B and category C included drugs which consume about 20% and 10% of the total costs respectively. For VED analysis, the life-saving drugs, the absence of which cannot be tolerated were included in Category V. Category E included drugs, the absence of which could be tolerated for short periods of time and Category D included drugs, the absence of which could be tolerated for longer periods of time. For deciding which drug would be included under which category in VED analysis, following methods were used. For speciality specific drugs, the respective clinicians, attending the UHC were consulted. For other drugs, the Centre-in-charge was consulted.
The unit cost of the drugs was obtained from the Pharmacist-in-charge of the Tertiary Medical College to which the UHC is attached to. Data was entered and analysed using the Microsoft Excel 2010.

4. Results and discussion

4.1 Results of Annual Drug Expenditure (ADE)

All the drugs which were present at the health centre were included. The list primarily consisted of only essential drugs. The total number of drugs included in analysis was 145.

Table 1: Comparison of the total drugs and ADE studied by various authors

Sr. No.	Author Name	No. of drugs included	Annual Drug Expenditure [ADE]	Year of study
1	Present study	145	10,58,046	2016
2.	Basuka *et al.* [7]	30	65,23,600	2015
3.	Mani *et al.* [2]	84	3,22,697	2014
4.	Anand *et a. l*[1]	129	4,35,847	2013
5.	Wandalkar *et al.*[9]	291	6,98,74,457	2013
6.	Gupta *et al.*[10]	325	55,23,503	2007
7.	Singh *et al.* [11]	416	4,84,00,000	2009
8.	Devnani *et al.* [12]	421	4,00,12,612	2010
9.	Kumar *et al.*[4]	1536	52,80,45,085	2015

As seen in the above table, the total number of drugs included in the study (145) was more than that included by authors like Basuka *et al.* [7], Mani *et al*[2]. and Anand *et al*[1]., whereas Wandalkar *et al.*[9], Gupta *et al*[10]., Singh *et al*[11]., Devnani *et al.*[12] and Kumar *et al.*[4] all included higher number of drugs in their research studies. Moreover the Annual Drug Expenditure (ADE) was also higher for these research studies. This is primarily because, unlike some larger studies, the present study was not done in the pharmacy of the entire hospital, but was done in one of the peripheral health care centre attached to a Tertiary Medical College & Hospital. Being a peripheral health centre, serving a defined crowd, only the basic and essential healthcare is provided at this centre. Hence the drug requirements of the centre are also limited.

4.2 Result of ABC categorization of drugs

Table 2: Comparison of percentage of drugs included under ABC categorization of drugs.

Sr. No	Author Name	% of drugs in Cat A	% of drugs in Cat B	% of drugs in Cat C
1.	Our study	15.2	23.4	61.4
2.	Wandalkar *et al.*[9]	13.4	16.5	70.1
3.	Kumar *et al.*[4]	6.77	19.27	73.95
4.	Gupta *et al.*[10]	14.4	22.46	63.7
5.	Devnani *et al.*[12]	13.7	21.85	64.37
6.	Anand *et al.*[1]	18.6	24.0	57.4
7.	Basuka *et al.*[7]	17	20	63

It was observed that the percentage of drugs under category A, B and C was around 15.2%, 23.4% and 61.4% respectively. The prescribed norms for them are 10%, 20% and 70% respectively. Literature review shows the percentage of drugs in each category ranges from 6.7-18.6% (Category A), 16.5-24% (Category B) and 57.4-73.9% (Category C). It shows that the study findings are in coherence with other studies.

The reasons for Category A drugs (consisting mostly of antibiotics] and Category B drugs being used more than the recommended could be: i) Absence of Health Centre specific antibiotic policy, ii) Frequent turnover of doctors under training. These resulted into prescribing antibiotics to patients in whom use of antibiotics couldn't be rationalised.

The reasons for lesser number of drugs in Category C (consisting mainly of psychiatry and dermatological medicines) could be: i) fewer OPD sessions in each week, ii) less awareness amongst the community about the mental health services offered by the Centre.

4.3 Result of VED analysis of drugs

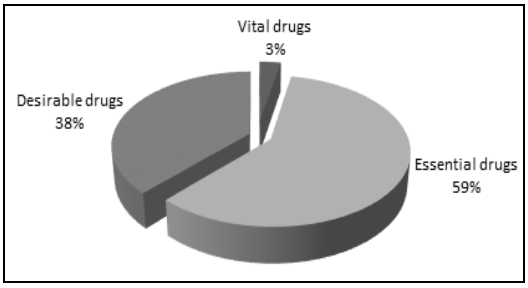

Fig 1: Distribution of drugs as per the 'VED' categorization of drugs.

As evident from the Figure 1, the total percentage of 'Vital' drugs were around 3%. Similarly, the percentages of drugs in the 'Essential' and 'Desirable' categories were 59% and 38% respectively.

The proportion of drugs under the 'Vital' category in the present study was less than the recommended 10% as well as compared to the other similar studies due to availability of OPD, indoor and emergency services by higher centres in the nearby vicinity. Moreover, the primary objective of the Urban Health Centre is imparting training in Urban Primary Health Care services only to the medical students. The proportion of drugs under the Essential category was more than the recommended 40% levels probably because of overuse of antibiotics.

4.4 Result of ABC-VED categorization of drugs

Table 3: Distribution of drugs as per the ABC-VED categorization of drugs

	V	E	D
A	0%	10.34%	4.82%
B	0%	13.79%	9.65%
C	3.4%	34.48%	23.48%

In any well managed inventory, the percentage of drugs, as well as the share of ADE they consume, should be the least for Category III drugs. The percentage of drugs as well as the share of the ADE for Category III drugs in the present study was around 23% and 3% respectively. Similar findings were also reported by Wandalkar *et al.* [9], Devnani *et al.* [12], Basukala *et al.* [7] and Mani *et al.* [2]

5. Recommendations

- Non-pharmacological life-style modifications, to reduce the need of the drugs (e.g. diet control, mental relaxation, physical exercise, water and sanitation) should be promoted.
- Stringent pharmacological guidelines for the treatment of a case should be observed. For e.g. formulating and adhering to the Standard Treatment Protocols as well as Institutional Antibiotic Policy.
- Equally effective but less costly pharmacological alternatives need serious consideration (for e.g. using T. Paracetamol instead of T. Nimesulide.)
- The mental health services offered at the Centre need wider advocacy amongst the community.

Table 4: Distribution of drugs for managerial interventions

Managerial Categories	Categories of drugs included	% of drugs in the Category	% of ADE consumed	Action needed
Category I	AV, AE, AD, BV & CV	19%	69%	Higher value. Require stringent management.
Category II	BE, BD & CE	58%	27%	Moderate Value. Monitoring by middle level managers
Category III	CD	23%	3%	Low value. Purchasing can be avoided if budget low

6. Limitations of the study

The VED analysis was done keeping in mind the needs of an UHC. This may differ in hospital based settings

7. Conclusion

- Any organization would need a well-managed inventory control to reduce extra costs due to wastages.
- ABC-VED analysis is one such effective method for drug inventory control.
- ABC-VED analysis helps to identify drugs requiring stringent control and those drugs whose purchase can be avoided.

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