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APPLICATION OF ABC-VED ANALYSIS IN THE MEDICAL STORES OF A TERTIARY CARE HOSPITAL

SB Pirankar[1], AM Ferreira*[1], F S Vaz[1], I Pereira-Antao[2], NR Pinto[1], SG Perni[1]

[1]Department of Preventive and Social Medicine, Goa Medical College, Bambolim, Goa, India, 403202.
[2]Department of Pharmacology, Goa Medical College, Bambolim, Goa, India 403202.

ABSTRACT

The aim and objective of this study is to analyze the annual drug expenditure at the medical stores in a Tertiary care hospital using ABC-VED inventory control techniques. Inventory control techniques ABC, VED and ABC-VED matrix analysis were utilized to study the drug expenditure at a 1000 bedded tertiary care hospital in Goa, India for the financial year 2011-12. The data was collected in pre designed formats. The data was then transcribed in a MS Excel spreadsheet. The statistical analysis was done using the MS Excel statistical functions. The results shows that out of the 141 drugs listed around 12.77 % of the drugs were found to account for 69.84 % of the annual drug expenditure at the hospital and were classified as A category drugs. Another 17.02% of the drugs consumed 19.88% of the budget (B category), while the remaining 70.21% of the drugs accounted for only 10.28 % of the annual drug expenditure (C category). Around 7.09% of the drugs were classified as vital drugs, 44.68% were Essential and 48.23% were considered as Desirable drugs. On ABC-VED matrix analysis around 18.44% of drugs were classified as category I and accounted for 71.95 % of the total drug expenditure. Another 48.94% of drugs were considered as category II drugs and were found to consume 24.39 % of the total drugs budget. The remaining 32.62% drugs were classified as category III drugs and these accounted for 3.66% of the total drug expenditure. Through the use of inventory control techniques Substantial improvement could be brought about not only in patient care but also in form of optimal use of resources.

Keywords: Inventory techniques, ABC-VED Analysis, Expenditure, Medical stores.

INTRODUCTION

Health care industry is a labour intensive organization. While salaries and fringe benefits account for roughly 60 percent of operating costs in a hospital, 30-35 percent of costs are incurred on materials and supplies like drugs etc. A logistic expenditure is possible on materials and supplies therefore, controlling these expenses [1]. A study from a 1500 bedded, state funded hospital has claimed that review and control measures for expensive drugs brought about 20% savings [2].

Inventory control is very essential in a developing country like India. India is a country of scarce resources and it is the primary responsibility of each organization to ensure optimum utilization of available resources to provide good service and quality care. It is estimated that a good amount of budget is blocked on inventories. Hence there arises the need for developing an efficient and effective inventory control system [3].

The present study was conducted at a tertiary care hospital in Goa to study the drug management through the application of inventory control techniques like ABC, VED and ABC-VED matrix analysis. Since health sector perennially faces a resource crunch it is essential that health managers use scientific methods to maximize their returns from investment at a minimal cost.

Corresponding Author:- **AM Ferreira** Email:- frederickvaz@rediffmail.com

MATERIALS AND METHODS

Inventory control techniques ABC, VED and ABC-VED matrix analysis were utilized to study the drug expenditure at the medical store of a 1000 bedded tertiary care hospital in Goa, India for the financial year 2011-12. The annual consumption and expenditure incurred on each drug was obtained. The data was collected in pre designed formats. The data was then transcribed in a MS Excel spreadsheet. The statistical analysis was done using the MS Excel statistical functions. ABC, VED and ABC-VED matrix analysis were done using following parameters and procedures:

ABC analysis

ABC cost analysis of all the drugs in the inventory of the hospital was done. The annual drug expenditure (ADE) of individual drugs was arranged in descending order. The cumulative cost of all the items was calculated. The cumulative percentage of expenditure was calculated as well as the cumulative percentage of number of items. Then this list was subdivided into three categories based on the cumulative cost percentage. Approximately, 10% of drugs consuming 70% of ADE constituted category A, 20% of drugs consuming about 20% value constituted category B while, the remaining 70% of drugs consuming 10% of ADE formed category C. The cut offs were not exactly at 10/20/70 but differed marginally.

VED analysis

The VED criticality analysis of all the listed drugs was done by classifying the drugs into Vital (V), Essential (E) and Desirable (D) categories. The drugs critically needed for the survival of the patients and which must be available at all times were included in the Vital (V) category. The drugs with a lower criticality need and which may be available in the hospital were included in the Essential (E) group and the remaining drugs with lowest criticality, the shortage of which would not be detrimental to the health of the patients were included in the Desirable (D) group. The VED status of each individual drug was determined after discussion with the faculty from the Department of Pharmacology, Goa Medical College.

ABC-VED matrix

The ABC-VED matrix was formulated by cross tabulating the ABC and VED analysis. From the resultant combination three categories were classified (categories I, II and III). Category I was constituted by drugs belonging to AV, AE, AD, BV and CV sub-categories. The BE, CE and BD sub-categories constituted the category II and the remaining drugs in the CD sub category constituted the category III. In the above sub-categories the first alphabet denotes its place in the ABC analysis while, the second alphabet stands for its place in the VED analysis.

RESULTS AND DISCUSSION

ABC ANALYSIS

Out of the 141 drugs listed around 12.77 % of the drugs were found to account for 69.84 % of the annual drug expenditure at the hospital (18 drugs) and were classified as A drugs (table 1). Another 17.02% of the drugs (24drugs) consumed 19.88% of the budget (B category), while the remaining 70.21% of the drugs (99 drugs) accounted for only 10.28 % of the annual drug expenditure (C category). Almost 70% of the drug expenditure has to be incurred on just 18 drugs (12.77%) hence these A category drugs need tight and efficient financial monitoring. In contrast C category drug require least control as they are cheap and larger quantities of these drugs can be stocked without blocking significant amount of money (i.e. at lowest opportunity and carrying cost). In a study conducted in Chandigarh [4] by Devnani M et al, 13.78% of drugs accounting for 69.97% of annual drug expenditure were labelled as A drugs, 21.85% of drugs consuming 19.95% of budget were classified as B category drugs while remaining 64.37% of drugs accounted for only 10.08% of annual drug expenditure. In a study in ESIC, New Delhi following findings was reported on ABC analysis [5]: about 20% of items were classified as A items consuming 75.9% of the total budget. Around 30% of items classified as Category B consumed 18.8% of the budget. Remaining 50% of the items were classified as C items and consumed only 5.2% of the total budget.

VED ANALYSIS

10 drugs (7.09%) were classified as vital drugs. Around 63 drugs (44.68%) of drugs were considered as essential, while 68 drugs (48.23%) were classified as desirable drugs (Table 2). Vital drugs accounted for only 5.86% of the annual drug expenditure of the hospital. Essential drugs accounted for 32.47 % of the drug expenditure, whereas desirable drugs were found to consume 61.67 % of the annual expenditure. Thawani VR et al [6] in their analysis in a teaching hospital reported following findings: Around 23.8% of drugs (53 items) were classified as Vital, another 38.1% (85 items) were classified as Essential and remaining 38.1% (85 items) were classified as Desirable. Sikdar SK et al [7] in their study in CGHS reported that 15 items (5.1%) were found to be Vital, 172 items (58.1%) were classified as essential and 109 items (36.8%) were considered desirable. Shortage of vital drugs for even a short period of time can cause serious problem in patient care. Therefore vital drugs should always be stocked in sufficient quantity to ensure their constant availability. This group of drugs must be controlled and monitored with greatest care. If essential drugs are in short supply for a number of days or a week, functioning of the hospital could be adversely affected (e.g. drugs like antibiotics). These drugs should also be controlled and monitored carefully. The shortage

of desirable drugs would not adversely affect the patient care or hospital functioning even if shortage is prolonged (Drugs like vitamins).

ABC-VED ANALYSIS

Table 3 shows categories of drugs based on ABC-VED matrix analysis and the corresponding drug expenditure. Around 18.44% of drugs were classified as category I and accounted for 71.95 % of the total drug expenditure. Another 48.94% of drugs were considered as category II drugs and were found to consume 24.39 % of the total drugs budget. The remaining 32.62% drugs were classified as category III drugs and these accounted for 3.66% of the total drug expenditure. Thawani et al [6] in their study in Nagpur hospital reported that 29.15% drugs belonged to category I and consumed about 79% of the budget. Category II was constituted by 41.26% of the drugs accounting for 17.3% of the total drug expenditure, while the remaining 29.59% of drugs were classified as category III drugs accounting for just 3.7% of the drug expenditure. ABC-VED matrix analysis helps in accurately identifying group of drugs needing strict monitoring and control as both cost and essentiality are factored in. ABC-VED matrix would therefore be a more suitable and efficient method in inventory control at any drug store.

Table 1. ABC analysis of drug inventory at the hospital medical stores

ABC Category	No. of items	Percentage of items (%)	Percentage of Annual Drug Expenditure (%)
A	18	12.77	69.84
B	24	17.21	19.88
C	99	70.21	10.28
Total	141	100	100

Table 2. VED analysis of drug inventory at the hospital medical stores

VED Category	No. of items	Percentage of items (%)	Percentage of Annual Drug Expenditure (%)
V	10	7.09	5.86
E	63	44.68	32.47
D	68	48.23	61.67
Total	141	100	100

Table 3. ABC-VED matrix analysis of drug inventory at the hospital medical stores

ABC-VED matrix category	No. of items	Percentage of items (%)	Percentage of Annual Drug Expenditure (%)
I	26	18.44	71.95
II	69	48.94	24.39
III	46	32.62	3.66
Total	141	100	100

CONCLUSION

Through the use of inventory control techniques like ABC, VED and ABC-VED Matrix substantial improvement could be brought about in patient care. These techniques would not only help in efficient and optimum use of scarce financial resources but would also help in avoiding shortage of drugs and stock out situations. Thus inventory control techniques could be effective financial and material management tools to promote prudence and discipline in material management in health care organizations.

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