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Original Article

ABC–VED analysis of expendable medical stores at a tertiary care hospital

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ABSTRACT

Background: The modern system of medicine has evolved into a complex, sophisticated and expensive treatment modality in terms of cost of medicines and consumables. In any hospital, approximately 33% of total annual budget is spent on buying materials and supplies including medicines. ABC (Always, Better Control)–VED (Vital, Essential, Desirable) analysis of medical stores of a large teaching, tertiary care hospital of the Armed Forces was carried out to identify the categories of drugs needing focused managerial control.

Methods: Annual consumption and expenditure data of expendable medical stores for one year was extracted from the drug expense book, followed by classification on its annual usage value. Subsequently, the factor of criticality was applied to arrive at a decision matrix for understanding the need for selective managerial control.

Results: The study revealed that out of 1536 items considered for the study, 6.77% (104), 19.27% (296) and 73.95% (1136) items were found to be A, B and C category items respectively. VED analysis revealed that vital items (V) accounted for 13.14% (201), essential items (E) for 56.37% (866) and desirable accounted for 30.49% items (469). ABC–VED matrix analysis of the inventory reveals that only 322 (21%) items out of an inventory of 1536 drugs belonging to category I will require maximum attention.

Conclusion: Scientific inventory management tools need to be applied routinely for efficient management of medical stores, as it contributes to judicious use of limited resources and resultant improvement in patient care.

Introduction

The modern system of medicine has transformed into a more complex, effective, sophisticated and expensive treatment modality in terms of cost of medicines, consumables and equipments. In any tertiary care hospital, approximately 33% of the annual operating budget is spent on buying materials and supplies, medicines being of the prime category.[1] The medical stores along with the dispensary where distribution

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of medicines takes place, is one of the most extensively used facility of the hospital and one of the few areas where a large amount of money is consumed by procurement action and maintenance. The medical stores are also related intimately to the overall satisfaction of hospital clientele as non-availability of medicines may lead to poor healthcare delivery and bad reputation for the healthcare organization. There is a need for judicious planning, designing, organizing and maintaining the pharmacy in a manner that results in efficient clinical and administrative services.[2]

A study conducted by the Department of Personnel and Administrative Reforms in India revealed that not only does the quantity of medicines received fell short of the projected requirement but also the supply was often erratic. Of the various explanations for non-availability of even simple medicines in the third world countries, a large number were found to be related to materials management.[3] A study conducted by Pillans et al. in a 1500-bedded state-funded hospital has claimed that better inventory control technique brought about 20% savings in hospital expenditure.[4] Multiple published studies have shown that inventory control techniques when made a routine practice in healthcare could bring about substantial improvement in patient care as well as optimal use of resources.[5,6]

It is a fact that inventory is an idle resource with an economic value and efficient management can definitely bring meaningful savings in hospital expenditure.[7] Two factors considered important in medical logistics management are cost and the criticality of the item. Among various selective inventory control techniques, methods that are commonly used are Always, Better Control (ABC) and Vital, Essential and Desirable (VED) analysis. ABC analysis is a method of classifying items or activities according to their annual usage value in monetary terms while VED analysis takes care of the criticality factor of drugs and consumables. ABC analysis had been conceptualized on the universal observation of a small number of items accounting for a large share of the total cost of materials and a comparatively larger number involving an insignificant share. Based on this criterion, items in an inventory are classified into category A (high usage value), B (moderate usage value) and C (low usage value). However health is considered to be priceless and hence medical stores are further classified on the basis of their criticality into Vital (critical for life and patient care), Essential (critical but alternatives acceptable) and Desirable items (low critical value).[8–10]

The present study was conducted to undertake an ABC–VED analysis of expendable medical stores being held by a large multi-specialty tertiary care hospital of the Armed Forces with a view to improve management and control of inventory of such stores.

Materials and methods

The study was an observational study carried out in the Medical Stores Department of the study hospital for a period of one month.

Annual consumption data of expendable medical stores for the financial year 2011–12 along with expenditure incurred on each item was retrieved from the Drug Expense Register and Medical stores management software (MSMS) being held by the hospital. The data was further transcribed to a MS Excel spreadsheet for quantitative calculations.

Annual usage for each drug (Consumption × Cost) was calculated for the financial year 2011–2012 from the data retrieved. The annual expenditure of individual items thus worked out was arranged in descending order and the cumulative cost of all the items was calculated. The cumulative percentage of expenditure and the cumulative percentage of number of items were then calculated for performing ABC analysis.

To decide upon the criticality of items, the complete inventory of drugs was presented to a group of five clinical experts for categorization of drugs on the basis of criticality, keeping the standard definition of Vital, Essential and Desirable drugs in consideration.

The final list of drugs arranged on the basis of criticality was analyzed for convergence of opinion, the acceptable range of concurrence being a minimum of three experts agreeing for the same classification of each individual item.

Thereupon, a matrix was prepared by combining the results of ABC and VED analysis to evolve an inventory control system that can be used for managerial prioritization. Each window in the matrix was labeled by two alphabets, the first alphabet denoting ABC classification and the second representing VED analysis. From the resultant combination, three categories were classified, category I being constituted by items belonging to AV, AE, AD, BV and CV subcategories. The BE, CE and BD subcategories constituted category II and the remaining items in the CD subcategory constituted category III.

Appropriate interpretations were derived for drugs classified in each window of the ABC–VED matrix for superior but selective control of the inventory being held by the Medical Stores Department.

Results

The drug inventory of the hospital in 2011–2012 consisted of 1536 items.

ABC analysis revealed A category items comprising 6.77% (104) expendable items consuming 70.03% of the total stores expenditure and B category items represented by 19.27% items (296) accounting for 19.98% expenditure. An astounding 73.95% (1136) items were found to belong to category C, consuming only 9.98% of the total expenditure (Table 1). The results are also being graphically displayed in Fig. 1 for better appreciation.

After ABC analysis, VED analysis was subsequently performed for ushering in the parameter of criticality in the analytical process. 13.14% (201) expendable items were found to belong to V group, 56.37% (866) to E group and the balance 30.49% (469) to D group of items (Table 2/Fig. 2).

Lastly the results of the ABC and VED analysis were further classified into a combined matrix representing the three essential functional parameters of "**Annual consumption, cost and criticality**". 322 (21%) items were found to belong to matrix classification I, whereas 427 (27.83%) items belonged to the CD window (Table 3).