

SYNOPSIS

ABC and VED Analysis of the Pharmacy Store of a Tertiary Care Teaching, Research and Referral Healthcare Institute of India

Introduction:

Approximately one-third of the hospital's yearly budget is allocated to purchasing medications and equipment. A pharmacy is an important therapeutic facility, and to guarantee effective clinical and administrative services, the pharmacy must be carefully planned, designed, and organized. The number of medications obtained in underdeveloped nations like India frequently falls short of needs, and supply is frequently unpredictable. One major factor contributing to the unavailability of basic medications is material management. For hospital pharmacies to maximize returns on investment while keeping costs to a minimum, inventory control is essential. Drug inventory management prioritizes high-cost, high-volume medications to save costs and increase efficiency. Material managers in hospitals need to set up effective inventory control procedures for both regular business operations and unexpected demand. ABC, VED analysis categorizes items into vital, essential, and desirable categories based on their criticality. Short-term shortages can disrupt patient care, while longer shortages can negatively impact hospital functioning. Combining ABC and VED analysis can help control material supplies. The study analyzed the pharmacy store to identify drug categories needing strict management control. This approach helps ensure efficient patient care and prevents potential harm.

Research questions:

- What is the impact of implementing ABC & VED analysis on inventory management and cost savings in tertiary care teaching hospital pharmacies?
- Does the combined use of ABC & VED analysis (ABC-VED matrix) improve medication availability compared to using them individually?
- How does ABC & VED analysis influence pharmacist workload and efficiency in tertiary care teaching hospitals?

Objective:

The specific objectives of this study were to:

- (1) analyze the annual consumption of items of pharmacy and expenditure incurred on them for the year 2023-24
- (2) establish a priority system using ABC, VED, and ABC-VED matrix analysis.
- (3) identify the item categories requiring greater supervisory monitoring.

Hypothesis:

Materials and Methods:

For the financial year, information on the annual consumption and expenses spent on each pharmaceutical item was gathered. After that, the information was entered into an MS Excel spreadsheet. The statistical functions in Microsoft Excel were used to do the statistical analysis.

ABC analysis
Each item's annual spending was listed in descending order. It was determined how much each item would

cost all together. Calculations were made to determine the cumulative proportion of spending and the cumulative percentage of items. After that, this list was split into three categories, A, B, and C, according to the cumulative cost percentages of 70%, 20%, and 10%, in that order.

VED evaluation

All of the mentioned objects underwent a VED criticality study, which involved categorizing them as vital (V), essential (E), and desirable (D) categories. The V category covered the patients' survival as well as those who had to be available at all times. The E category contained the things that might be found in the hospital and those with a lower criticality demand. The D group contained the remaining, least vital goods, the shortage of which would not have an adverse effect on the patients' health. A group of doctors, surgeons, pediatricians, and chemists discussed and provided reasons for each item's VED status.

Matrix analysis with ABC-VED

By cross-tabulating the results of the ABC and VED analyses, the ABC-VED matrix was created. Based on the resulting combination, three groups were identified. The goods in Category I were those that belonged to AV AE, AD, BV and CV subcategories.

Data Analysis Plan:

This plan outlines the steps to analyze data and conduct ABC & VED analysis on the pharmacy store of a tertiary care teaching hospital.

Data Collection:

Data Source:

Pharmacy Information System (PIS): Records of medication purchases, usage, and current inventory levels.

Financial records: Medication acquisition costs.

Data Points:

Medication name, generic equivalent (if applicable), Dosage form (tablet, injection, etc.), Unit cost,

Monthly/Quarterly usage data (units dispensed), Current inventory level.

Data Cleaning and Preprocessing:

Remove duplicate entries and inconsistencies, Standardize medication names and formats, Check for missing or outlier data points.

ABC Analysis:

Calculate Annual Dollar Expenditure (ADE): Multiply unit cost by annual usage for each medication.

Sort medications: Arrange medications in descending order of their ADE.

Calculate Cumulative Percentage: Calculate the percentage of total ADE each medication contributes.

Classify medications: Divide medications into categories based on their cumulative percentage contribution:

A Category (High Importance): Top 20% of medications with the highest ADE. Require tight control due to significant cost impact.

B Category (Medium Importance): Next 30% of medications. Require moderate control.

C Category (Low Importance): Bottom 50% of medications. Less stringent control needed.

VED Analysis:

Classify medications: Categorize medications based on their criticality for patient care:

Vital (V): Essential medications for life-saving or critical care.

Essential (E): Important medications for common conditions or treatments.

Desirable (D): Medications with clinical benefits but not essential.

Combine with ABC Categories:

Create an ABC-VED matrix to identify priority medications:

Category I (Most Critical): High-cost, high-usage, vital medications (A & V).

Category II: High-cost, high-usage, essential or desirable medications (A & E/D).

Category III: All other medication combinations (B & C with any VED category).

Data Analysis Techniques:

Descriptive Statistics: Summarize medication usage patterns, costs, and inventory levels by category (ABC, VED, and ABC-VED).

Correlation Analysis: Analyze potential correlations between medication category and factors like unit cost, usage patterns, or stockout rates.

Cost-Effectiveness Analysis: Evaluate potential cost savings and resource allocation based on ABC & VED classifications.

Expected Outcomes:

Identify medication categories with the highest cost impact (A category) and criticality (V category) for focused management.

Develop an ABC-VED matrix to prioritize medications for tighter inventory control, purchasing strategies, and potential cost-saving measures.

Gain insights into medication usage patterns within the tertiary care teaching hospital.

Software Tools:

Spreadsheet software (Microsoft Excel, Google Sheets) for data manipulation and analysis.

Statistical analysis software (R, Python) for advanced analysis.

Ethical Considerations:

Ethical considerations arise when prioritizing medications based solely on cost. Develop a clear policy for ensuring access to essential medications regardless of ABC category. This might involve patient assistance programs, financial aid, or alternative prescribing options.

Integrate VED analysis to ensure vital medications (category V) receive priority, even if they fall under B or C in ABC classification (ABC-VED matrix).

Implications:

Implementing ABC & VED analysis can lead to reduced overall inventory costs by focusing control on high-cost medications (category A). More efficient ordering practices and minimized stockouts through better demand forecasting. Improved resource allocation for the pharmacy department. By optimizing inventory management, ABC & VED analysis can help ensure:

Increased availability of essential medications (VED category V) regardless of cost (ABC category).

Reduced medication shortages that could delay or compromise patient care. More efficient use of pharmacist time, allowing them to dedicate more time to patient consultations and medication reconciliation.

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