

SYNOPSIS

Submitted to



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by

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FORMAT OF SYNOPSIS

TITLE: Impact of Inventory Control Techniques (ABC and VED Analysis) on Inventory Management Efficiency in Hospital Supply Chain Management

INTRODUCTION:

Inventory management is one of the most important functions in hospital supply chain management because hospitals deal with many medicines, surgical items, medical consumables, equipment, and emergency supplies daily. Proper inventory control ensures the uninterrupted availability of essential medical items while also minimizing unnecessary costs, wastage, stock-outs, and overstocking.

Hospitals spend a significant portion of their budget on purchasing and maintaining inventories. Poor inventory management may lead to financial losses, expiry of medicines, shortage of life-saving drugs, delayed patient care, and operational inefficiency.

Among various inventory control methods, ABC analysis and VED analysis are the most widely used techniques in healthcare institutions.

ABC Analysis

ABC analysis is based on the annual consumption value of inventory items.

- Category A items: High-cost items with low quantity but maximum financial impact.
- Category B items: Moderate cost items.
- Category C items: Low-cost items with high quantity but minimal financial impact.

VED Analysis

VED analysis categorizes inventory items based on their criticality to hospital operations.

- Vital (V): Items essential for patient survival and emergency care.
- Essential (E): Items necessary for routine operations but temporary shortages can be managed.
- Desirable (D): Items with lower critical importance and minimal impact if unavailable for a short duration.

Combined ABC-VED Matrix

The integration of ABC and VED analyses provides better inventory prioritization and helps hospitals identify items requiring strict monitoring and control. It improves decision-making related to procurement, storage, stock levels, and budget allocation.

RESEARCH QUESTION: What are the benefits of implementing combined ABC-VED analysis in hospital supply chain management?

OBJECTIVES:

Primary Objective-

To assess the impact of ABC and VED inventory control techniques on inventory management efficiency in hospitals.

Secondary Objectives-

1. To classify hospital inventory items using ABC analysis.
2. To categorize hospital inventory items using VED analysis.

HYPOTHESIS:

Null Hypothesis (H0)

There is no significant impact of ABC and VED inventory control techniques on hospital inventory management efficiency.

Alternative Hypothesis (H1)

ABC and VED inventory control techniques significantly improve hospital inventory management efficiency by reducing costs, minimizing stock-outs, and improving availability of essential items.

MATERIAL AND METHODS:

STUDY DESIGN: The study will be conducted using descriptive and analytical cross-sectional study design.

The research will involve collection and analysis of inventory-related data from the hospital supply chain or medical store department. ABC and VED analyses will be applied to inventory records for evaluating inventory control efficiency.

SETTING: The study will be conducted in the Supply Chain Management / Medical Store Department of a tertiary care hospital.

The selected hospital maintains a large inventory of medicines, surgical consumables, emergency supplies, and medical equipment required for patient care and hospital operations.

STUDY POPULATION:

The study population will include:

- Medicines
- Surgical consumables
- Medical supplies
- Emergency drugs
- Hospital inventory records

STUDY POPULATION CRITERIA

Inclusion criteria: Inventory items available in the hospital during the study period. Staff involved in inventory management processes.

Exclusion criteria: Incomplete inventory records. Expired or obsolete items are not currently in use.

Study tools: How long will the following tools be used during the study:

1. Hospital inventory registers
2. Stock issue and consumption records
3. Procurement records

DURATION OF STUDY: The duration of the study will be approximately 3 to 6 months.

SAMPLE SIZE: The sample size will consist of selected inventory items available in the hospital during the study period.

For example: Approximately 200–500 inventory items may be included depending on hospital size and data availability.

SAMPLING TECHNIQUE: A purposive sampling technique will be used.

Inventory items will be selected based on:

- Availability of records
- Frequency of use
- Relevance to hospital operations

DATA COLLECTION PROCEDURE: The following steps will be followed for data collection:

1. Permission will be obtained from hospital authorities.
2. Inventory records and procurement data will be collected from the supply chain/medical store department.
3. Annual consumption value of inventory items will be calculated.
4. ABC analysis will be performed based on annual consumption costs.
5. VED analysis will be performed based on criticality of items.

OPERATIONAL DEFINITIONS:

Inventory management refers to the process of ordering, storing, controlling, and monitoring medical supplies and medicines within ABC Analysis.

A method of inventory categorization based on annual consumption value.

- A category: High-value items
- B category: Moderate-value items
- C category: Low-value items

VED Analysis

A method of inventory classification based on criticality.

- Vital: Life-saving items
- Essential: Necessary items
- Desirable: Non-critical items

ABC-VED Matrix

A combined inventory control technique used to identify items requiring strict managerial control and monitoring.

Stock-out

A condition where inventory items become unavailable when required.

DATA ANALYSIS PLAN: Statistical Analysis

1. Descriptive statistics:

- Frequency
- Percentage
- Mean
- Standard deviation

2. ABC Analysis:

- Classification of inventory items according to annual consumption value.

3. VED Analysis:

- Classification of items based on criticality.

4. ABC-VED Matrix Analysis:

- Preparation of matrix categories such as AV, AE, AD, BV, BE, etc.

5. Comparative analysis:

- Comparison of inventory costs and stock management efficiency.

6. Graphs and charts:

- Pie charts
- Bar diagrams
- Inventory distribution charts

ETHICAL CONSIDERATIONS:

1. Permission will be obtained from the hospital administration and department concerned.
2. Confidentiality of hospital records and data will be maintained.

IMPLICATIONS OF RESEARCH:

The study will help hospitals improve inventory management practices and ensure better utilization of resources.

REFERENCE:

1. Khurana S, Chiller N, Gautam VKS. Inventory Control Techniques in Medical Stores of apollo Indraprastha hospitals, New Delhi.