

ABC, FSN ANALYSIS OF DRUG STORE OF A TERTIARY CARE HOSPITAL¹Dr. Sonu Thakur, ^{2*}Dr. Atal Sood, ³Dr. Dinesh Kansal, ⁴Dr. Anant Ram, ⁵Dr. Sushma Sawaraj¹MD Pharmacology, Dr RPGMC Kangra at Tanda, HP.²Professor & HOD, Department of Pharmacology, Dr. RPGMC Kangra at Tanda, HP.³Professor & HOD (Retd.), Department of Pharmacology, Dr RPGMC Kangra at Tanda, HP.⁴Senior Resident, Department of Hospital Administration, Dr RPGMC Kangra at Tanda, HP.⁵Assistant Professor, Department of Pharmacology, Dr RPGMC Kangra at Tanda, HP.***Corresponding Author: Dr. Atal Sood**

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Article Received on 21/03/2023

Article Revised on 11/04/2023

Article Accepted on 01/05/2023

ABSTRACT**Objective:** To categorize various hospital drugs and consumables as per standard inventory control techniques.**Methods:** This was a retrospective, observational and analytical study of drugs and consumables of a tertiary care hospital. Always Better Control (ABC) and Fast, Slow and Nonmoving (FSN) analysis were carried out for 359 drug items purchased in the central drug store during the financial year of 2020-2021. The drugs were classified as A, B and C category based on their annual usage value and as Category Fast(F), Slow(S), Nonmoving(N) drugs based on their consumption rate respectively. **Results:** ABC Analysis showed that 44 (12%) items were found to be in class A while class B had 80 (22%), and class C constituted 235 (66%) of total items. These costed 70%, 20%, and 10% of total Annual Drug Expenditure (ADE) respectively. FSN analysis revealed that 148 out of 359 items were classified as F class drugs and it costed 59% of total annual expenditure. 157 items were considered as S class costed 37% of expenditure and the remaining 54 items were of N class costed 4% of total annual expenditure.**Conclusion:** The study explained the need for the application of ABC and FSN analysis, and the involvement of hospital pharmacists in the regular implementation of inventory analysis towards effective management of drug stores in a hospital setting.**KEYWORDS:** Inventory control, ABC analysis, FSN analysis, Annual Drug Expenditure (ADE).**INTRODUCTION**

Inventory management is the heart of the pharmaceutical supply system. It is defined as the continuing "process of planning, organizing and controlling inventory" that aims at minimizing the investment in inventory while maintaining a sound balance between holding costs, on the one hand, and purchasing and shortage costs, on the other and also stresses on cost containment, better efficacy, demand and supply. There is no denying that stocking hospital pharmaceuticals and supplies can be expensive and tie up a lot of capital, and bringing efficiencies to such important cost drivers - often 30-40% of a hospital's budget - can present meaningful savings. Thus, a hospital materials manager to keep an eye on each and every drug used in hospitals, must establish efficient inventory system policies for normal operating conditions that also ensure the hospital's ability to meet emergency demand conditions and the relevant costs need to be identified, quantified and then examined for how they interrelate. However, inventory mismanagement causes unnecessary rise in procurement and carrying cost and an imbalance in the supply and demands equation. In the beginning of the process, it is important to identify the costliest drug items, and then to

design a strategy for further study and identify their use pattern. The study of use pattern will help in designing suitable remedial actions.^[1-4]

Inventory control is a tool of management which is used to maintain an economic minimum investment in materials and products for the purpose of obtaining a maximum financial return. The entire concept of inventory control stems out of basic economic principle that is stretching the limited means to meet the unlimited ends.

There are some important terminologies which are used in inventory control. These are lead time, buffer stock, reorder level, optimum safety stock.

Lead time is the average duration of time in days between the placing of order and receipt of materials. Lead time to procure any items can be divided in to two parts:

1. Internal lead time
2. External lead time

1. Internal lead time is the time required for organizational formalities to be completed, e.g. placement of requisition from the other user department to the procurement department, tender notification, tender opening and so on.

2. External lead time is the time taken in placement of order and receipt of goods.^[5]

Buffer stock is the quantity of stores set apart as a safeguard against the variation in demand and procurement period. This quantity should be used only at the time of emergency for unforeseen demands.

Reorder level is used to denote the stock level at which fresh order has to be placed.

Inventory Management

There are various methods for inventory management.

These are as following:

- Eyeballing technique,
- Double shelf method or
- A/B method,

Modern techniques:

- Always, better, control (ABC),
- vital, essential, desirable (VED),
- fast-moving, slow-moving, nonmoving (FSN),
- scarce, difficult, easy (SDE) and high, medium, low (HML).

ABC analysis, also known as “Always Better Control,” is an important tool used to identify items that need greater attention for control.^[6-7]

ABC analysis

This analysis categorizes items based on their annual consumption value; sometimes Inventory Managers can use Pareto’s Principle for classification. Pareto’s Principle classifies the important items in a certain group that usually constitute a small portion of the total items in the group. The majority of the items, as a whole, will seem to be of minor significance. Here is how ABC Analysis looks like:

CLASS A: 10% of total inventories contributing towards 70% of total consumption value

CLASS B: 20% of total inventories, which account for about 20% of total consumption value

CLASS C: 70% of total inventories, which account for only 10% of total consumption value

RESULTS

Table-1: Always, Better, Control (Abc) Analysis.

Drug analysis	Always (A)	Better (B)	Control (C)	Total
Total annual consumption%	70%	20%	10%	100%
Value of annual consumption	5,67,83,120 ₹	1,62,49,580₹	78,75,607₹	8,09,08,307₹
No of items	44	80	235	359
% age of items	12%	22%	66%	100%

FSN Analysis

This analysis classifies inventory based on quantity, rate of consumption and frequency of issues and uses. Here is the basic depiction of FSN Analysis:

F stands for Fast moving, S for Slow moving and N for Nonmoving items.

Fast Moving (F) = Items that are frequently issued/used

Slow Moving (S) = Items that are issued/used less for certain period of time

Non-Moving (N) = Items that are not issued/used for more than certain duration.^[8]

The present study was conducted to analyse the effectiveness and applicability of ABC and FSN tools for the inventory of drugs and to identify the item categories requiring greater supervisory monitoring in the drug store of a tertiary care hospital.

METHODS

This was a retrospective, observational and analytical study of drugs and consumables. The present study was carried out in Department of Pharmacology, Dr. R.P.G.M.C. Kangra at Tanda, Himachal Pradesh. The data was collected retrospectively from 1st April 2020 to 31st March 2021 after permission from Ethics Committee.

➤ PRC approval vide letter no. D. No. HFW-H (DRPGMC) PRC/2021-143 Dated 19/06/2021

➤ IEC approval vide letter no. - IEC/50/2021 Dated 28/08/2021

Inclusion Criteria: All drugs and consumables purchased through drug procurement system were included in my study.

Exclusion Criteria: General stores such as cleaning material, patient furniture, linen store, dietary store and stationery stores were excluded.

Study duration: The data was collected for a period that is from April 2020- March 2021 after permission from Ethics Committee. Data was obtained from the stock register of Central Drug Store of Dr. RPGMC Kangra at Tanda and total expenditure on procurement was calculated. Final analysis was done by using ABC, FSN analysis. The data was presented as graphs and qualitative analysis was done.

ABC Analysis showed that 44 (12%) items were found to be class A while class B had 80 (22%), and class C constituted 235 (66%) of total items. These costed 70%, 20%, and 10% of total Annual Drug Expenditure (ADE) respectively.

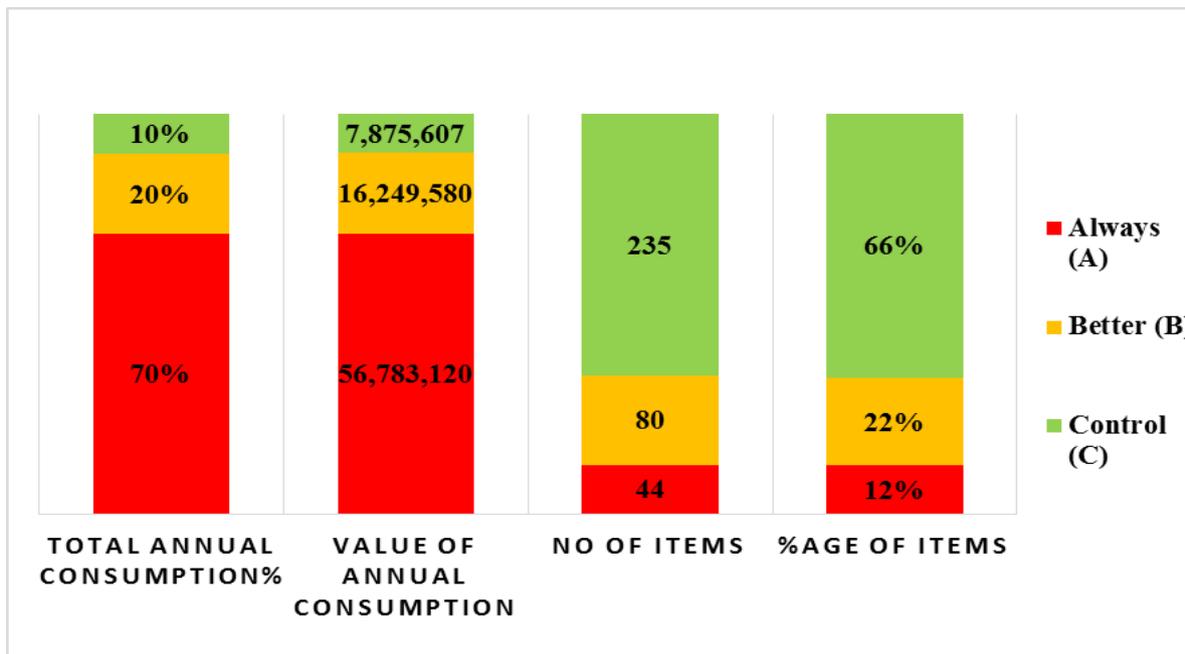


Figure 1- Always, Better, Control (Abc) Analysis.

Table-2: Fast Moving, Slow Moving, Nonmoving (Fsn) Analysis.

CATEGORY	NO OF DRUGS	%AGE OF DRUGS	Annual Drug Expenditure (ADE)	%age of ADE
F	148	41%	4,73,27,769₹	59%
S	157	44%	2,98,18,711₹	37%
N	54	15%	37,61,528₹	4%
TOTAL	359	100%	8,09,08,308₹	100%

FSN analysis revealed that 148 out of 359 items were classified as F class drugs and it costed 59% of total annual expenditure. 157 items were considered as S class costed 37% of expenditure and the remaining 54 items were of N class costed 4% of total annual expenditure.

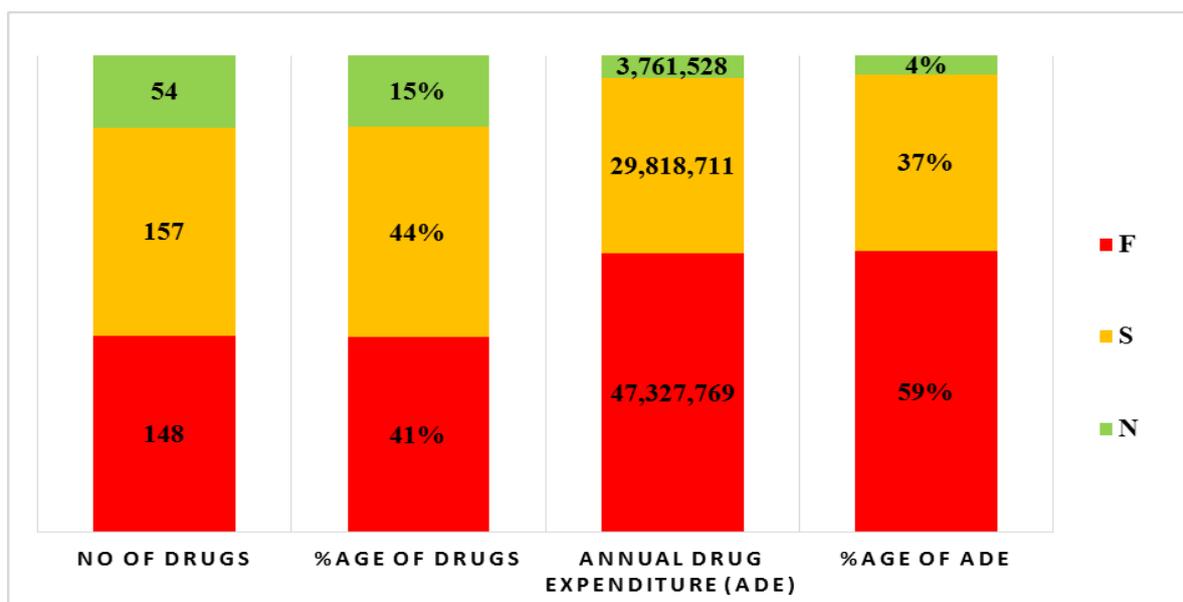


Figure 2- Fast Moving, Slow Moving, Nonmoving (Fsn) Analysis.

DISCUSSION

The aim of study was to categorize various hospital drugs and consumables as per standard inventory control techniques. There were total 359 items including drugs and consumables. Final analysis was done using ABC and FSN analysis. ABC analysis revealed that the annual value of consumption for the inventory worked out to be Rs. 8,09,08,307. Out of these drugs, 12% items (44) consumed 70% of annual drug expenditure which comprising group "A" items. 22% items (80) consumed 20% of annual drug expenditure, forming group "B" items. Rest 66% inventory consumed only 10% of the annual budget and were classified as group "C" items. Similar study carried out by Gupta^[6] et al in a 190 bedded hospital showed that 14.4% items consumed 70% of annual drug expenditure comprising the A group while group C constituted 63.7% items which consumed 10% of annual drug expenditure of the hospital. Another study conducted by Hussain M^[9] et al revealed that 35 items (14%), 52 items (21%), and 171 items (69%) were categorized into A (70% annual consumption value [ACV], B (20% ACV), and C (10% ACV) category, respectively. However, the present study was different from a study conducted at the hospital in Turkey by GünerGören H^[10] et al where only 10% of class A items consumed 80% of pharmaceutical expenditures, 23% (class B items) and 67% (class C items) consumed 17% and 3% of pharmaceutical expenditures respectively. This difference might be due to the difference of level of health facility, pharmaceutical products included for the study and difference of pharmaceutical budget allocated. FSN analysis revealed that 148 out of 359 drugs were classified as F class drugs and it costs 59% of annual expenditure. 157 drugs were considered as S class costs 37% of total expenditure and 54 drugs were of N class costs 4% of annual expenditure. Similar results were found in a study conducted by Manivel P^[11] et al in which F class costs 56.3%, S class costs 24.25% and N class costs 19.45% of total drug expenditure respectively. Another study conducted by Gizaw T^[12] et al revealed that Fast-moving items accounted for 73.1%, Normal-moving items costed 20.30% and Slow-moving items costed 6.60% of annual drug expenditure. FSN analysis of the present study was different form study conducted by Kumar A^[13] et al in which F items consumed 38.49%, S items consumed 54.74% and N items consumed 6.77% of annual drug expenditure. This variation might be due to the difference in the level of the health care settings, each health facility may use different pharmaceutical products and pharmaceuticals budget of each health facility.

CONCLUSION

This study assessed the pharmaceutical Inventory management facilities of tertiary care hospital by using ABC and FSN analysis. During the year April 2020-March 2021, items of approximately 8,09,08,308₹ were issued by the drug store of a tertiary care hospital. This necessitates application of scientific inventory management tools for effective and efficient

management of the drug stores, efficient priority setting, decision making in purchase and distribution of specific items and close supervision on items belonging to important categories.

FINANCIAL DISCLOSURE

I did not get any financial benefit from any pharmaceutical company or any other source for this study.

CONFLICT OF INTEREST

No conflict of interest pertaining to any part of the study.

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