PURCHASING AND INVENTORY MANAGEMENT BY PHARMACIST OF A PRIVATE HOSPITAL IN NORTHEAST OF THAILAND

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INTRODUCTION

Medicines and medical supplies consume are the major portion of the hospital expenses. The rising of drugs and medical supplies cost directly affect the total expenses of the hospital. Thus, inventory system should be developed in a cost effective manner [1]. The stock systems that support enough products to each department are needed. However, the overstock causes more financial problems and spends more time to resolve. Conversely, drug shortages can unpleasantly affect drug treatment, delay medical processes, and may result in medication error [2]. Many causes of drug shortages were described i.e. unexpected demand, natural disasters, etc. [3]. Thus, over and unnecessary of drugs having very less used over a period of time and lower stocking should be prevented [4]. There are three components of a cost-management program; pharmacy-directed activities, interdisciplinary activities, and reimbursement & charging. The pharmacy-directed activities composed of three topics; purchasing, inventory management, and waste reduction [5]. Thus, the pharmacy management team plays the important role in this systematization.

ABC (always, better, and control) analysis is a method of categorizing drug items according to their relative importance. The analysis categorize items into three categories: category A-C means the first 10-15% of the items account for approximately 70% of cumulative cost, 20-25% of the items account for a further 20% of the cumulative cost, and the remaining 65-70% of the items account for 10% of the total value, respectively. The limitation of ABC analysis is that it is only based on financial value and consumption rate. For example, an item of low monetary value and consumption may be vital. Their importance cannot be ignored simply because they do not appear in category A [6]. Thus, coupling with VED (vital, essential, and desirable) analysis will solve this problem. The coupling of ABC and VED analysis showed the effective and efficient manner for drug inventory management [7-10]. A studied private hospital located in the Northeastern of Thailand. This hospital is a secondary hospital with 50 beds. The former purchasing and inventory management were managed by only one pharmacist. But, the reveal, checkable, and systematic purchasing and inventory system are required. Recently, the purchasing and inventory management of the private hospital in this study were reformed by inventory pharmacist and administrative team. The aim of this study was to improve the purchasing and inventory management system to transparent and checkable manner, before (only one inventory pharmacist) and after (inventory pharmacist work with administrative team) the improved systems were compared.

MATERIALS AND METHODS

Phase 1 (problem identification)

The retrospective data including rate of approved purchasing documents, rate of inspected products, rate of correct received products, rate of destroyed or expired products, rate of reserved products, and rate of product shortages during January 2010 to December 2011 were collected. The identified problems of purchasing and inventory management were solved by improving the purchasing and inventory management system. The key performance indicators during January 2012 to May 2012 were collected. The improved results were compared.

Phase 2 (problem solving)

The identified problems of purchasing and inventory management during 2010-2011 were solved by improving the purchasing and inventory management system to transparent and checkable manner, before (only one inventory pharmacist) and after (inventory pharmacist work with administrative team) the improved systems were compared.
Table 1: Key processes, process requirements, key performance indicators, and goal of purchasing and inventory management

<table>
<thead>
<tr>
<th>Key processes</th>
<th>Process requirements</th>
<th>KPI</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Purchasing and procurement</td>
<td>Purchasing documents were approved by executive vice president of hospital</td>
<td>Rate of approved purchasing documents</td>
<td>100%</td>
</tr>
<tr>
<td>2. Products inspection</td>
<td>- All products were inspected by the committee</td>
<td>Rate of inspected products</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>- All received products were correct with purchasing documents</td>
<td>Rate of correct received products</td>
<td>&gt; 95%</td>
</tr>
<tr>
<td>3. Products handle and storage</td>
<td>- Fewer destroyed or expired products</td>
<td>Rate of destroyed or expired products</td>
<td>&lt; 0.5%</td>
</tr>
<tr>
<td></td>
<td>- Products were sufficed for hospital needs</td>
<td>Rate of reserved products</td>
<td>&lt; 3mo.</td>
</tr>
<tr>
<td>4. Products distribution</td>
<td>All departments were altogether received the correct products</td>
<td>Rate of product shortages</td>
<td>&lt; 1%</td>
</tr>
</tbody>
</table>

Phase 3 (monitoring and evaluation)

The data including rate of approved purchasing documents, rate of inspected products, rate of correct received products, rate of destroyed or expired products, rate of reserved products, and rate of product shortages during January 2012 to May 2012 were collected. The improved results were evaluated.

RESULTS AND DISCUSSION

Well-organized inventory management system reduces the problems of over-stock, out-of-stock, dead stock of drugs, and also decrease the time spent in gathering and taking care of drug stock control. In addition, the minimal purchase orders would decrease the total expenses in the current inventory control, and finally increase the hospital’s profit [11]. In this study, the former inventory management, only one inventory pharmacist in this private hospital managed for all purchasing for the hospital without controlling from purchasing committee. However, World Health Organization suggested that no single individual should have total control of pharmaceutical purchasing and procurement. A designated purchasing committee will review and approve all purchases [12], the improved purchasing and inventory management were constructed. The top-down flow chart of improved purchasing and inventory management is shown in Figure 1.

![Flow chart of improved purchasing and inventory management](image-url)
In 2012, the new purchasing and inventory management was adopted. Initially step of purchasing, purchase documents were prepared by only one pharmacist. The purchase documents contained product items, supplier’s name, quantity, price per unit, total price, and consumption rate. The required products from different departments were concluded by the pharmacist before submit to the purchasing committee. The purchasing committee contains five people including the administrative director, the administrative assistant director, the general administrative manager, the account and financial department supervisor, and the pharmacy department supervisor. The meeting was set at once a month in the first week. The approved purchasing documents were signed by all committee and then were submitted to the executive vice president of the hospital. The approved documents were signed by the executive vice president. If they were not approved, the unapproved purchasing documents were revised and re-submitted. After all documents were completely approved, the inventory pharmacist can send these purchase orders via telephone, fax, or e-mail. The inspection process was initiated when the purchased products were received. The three inspection committee including the inventory pharmacist, the
For the best quality and efficacy of drug during storage period, the temperature and humidity monitoring equipment is very necessary. The two new air conditioners were installed and these air conditioners automatically switch on every 12 hours. For the best quality and efficacy of refrigerated medicines or thermolabile drugs, especially vaccines were purchased and the temperature and humidity were recorded alternatively. The temperature and humidity monitoring equipment was used before the new one. The handwritten stock card system was removed and substituted with the computerized program. Computerized program was selected because it can decrease workload, personnel time, and administrative budget, made inventory functions faster and easier.

Table 2: Results of each key performance indicators during January 2010 to May 2012

<table>
<thead>
<tr>
<th>KPI</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate of approved purchasing documents (%)</td>
<td>N/A</td>
</tr>
<tr>
<td>Rate of approved purchasing documents (%)</td>
<td>N/A</td>
</tr>
<tr>
<td>Rate of correct received products (%)</td>
<td>56</td>
</tr>
<tr>
<td>Rate of destroyed or expired products (%)</td>
<td>2</td>
</tr>
<tr>
<td>Rate of reserved products (months)</td>
<td>5.4</td>
</tr>
<tr>
<td>Rate of product shortages (%)</td>
<td>12.0</td>
</tr>
</tbody>
</table>

N/A = not available

CONCLUSION

The improved purchasing and stock management system, which has been developed by pharmacists was successful. All purchase documents and received products were 100% approved and inspected by the administrative team. Rate of correct received products was increased. Rate of destroyed or expired products and rate of product shortages decreased. Furthermore, rate of reserved products was not more than three months. However, the sustainable of the improved system must be further monitored.

REFERENCES


