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Clinical Pharmacy Management System in drug discovery Process

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ABSTRACT
In China, hospital information systems are frequently employed to increase productivity. The function of giving clinical pharmacists access to pharmacological information is absent, nevertheless. By offering pharmacy information services and encouraging wise medication use, a unique clinical pharmacy management system created by our hospital has been used to increase the job efficiency of clinical pharmacists in our hospital and to conduct large sample statistical analyses. A clinical pharmacy management system was created based on the current circumstances. The effectiveness of clinical pharmacists' job, the quality, and qualified rates of prescriptions before and after using the clinical pharmacy management system were compared using a prescription review in the department of general surgery as an example. The general surgery department's statistics for 48,562 outpatient and 5776 inpatient prescriptions were examined. The department of general surgery saw a rise in qualified rates for both inpatient and outpatient prescriptions, but the usage of antibiotics fell. This system appears to have increased productivity and standardized drug dosage and accuracy, which will enhance our hospital's pharmacy information service and promote rational drug usage. Antibiotic prophylaxis was also used less frequently during aseptic procedures.
Keywords: Clinical pharmacist, electronic information, pharmaceutical services, prescription review

I. INTRODUCTION

Hospitals now handle medical information quite differently as a result of China's national health reform and the quick development of computer communication technology. The clinical pharmacy management system (CPMS) is the main component of hospital information systems (HIS), which are used by many hospitals to store, manage, and dispose of a large amount of medical data electronically.[1,2] CPMS at our hospital now places a strong emphasis on ensuring the supply of pharmaceuticals, including the stock, sale, and storage of drugs, i.e., the logistics and cash flow. The shift from manual to computerized accounting has been achieved by this system. However, our hospital's pharmacists have steadily shifted their attention to providing patient-centered pharmaceutical care.[3,4] The existing HIS lacks the capability of delivering pharmaceutical information services for clinical pharmacists, which may be fixed by implementing cutting-edge computer software.[5,6]

Currently, the clinical pharmacists' primary duties at our hospital include:
1) Working closely with doctors to understand patients' general conditions and completing their associated medical records.
2) Prior to 2011, clinical pharmacists at our hospital chose 100 outpatient prescriptions and 30 inpatient medical orders at random each month in order to assess, examine, finish, and submit the prescription review lists.
3) In accordance with the requirements stated in "Notification on the establishment of clinical use of antibiotics and bacterial resistance monitoring network" (Except for the establishment of national "clinical use of antibiotics monitoring network" and "bacterial resistance monitoring network," corresponding monitoring should also be gradually carried out in appropriate areas and units.), the clinical pharmacists should randomly select 120 medical records each year to comply with the requirements stated in "Notification on the establishment of clinical use of antibiotics and bacterial resistance monitoring network".
4) Completing the adverse drug reactions (ADR) reports on a monthly basis.
When the clinical pharmacists at our hospital attempt to carry out the aforementioned objectives, there will be two issues, one of which is the severe workload. When conducting a prescription review, for instance, pharmacists must choose 100 prescriptions and 30 medical orders equally in accordance with the specifications. They must also study the matching paper medical records in order to extract and assess the information included in the

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prescriptions or medical orders. Completing the prescription review paperwork will also need extra time and effort. Checking the specific medicine details in each prescription is necessary, especially when filling out the number of fundamental medications. In the meanwhile, pharmacists filling out antibacterial medication reports must look through all of the patients' medical records to gather the necessary data, which will take a lot of time to finish just one report form. Additionally, samples of 100 prescriptions, 30 medical orders, and 120 medical records are still insufficient, because the data collected by various samplers will vary significantly over the course of the same time period. As a result, the figures do not accurately represent the general situation regarding prescriptions and antibiotic usage. Therefore, it is essential to systematize, standardize, and scientifiy the management in order to successfully increase the total work efficiency of the pharmaceutical department. Thusly inspired, our hospital created revolutionary CPMS in 2010 that is more suited for clinical pharmacists, and it went into force on January 1, 2011. With the system's connection to our hospital's HIS, clinical pharmacists will no longer be required to perform manual sampling, examine prescriptions (also known as medical orders), or fill out reports on the usage of antibiotics. In addition, CPMS can alter paper prescriptions and medical orders in accordance with the "Prescription Administrative Policy" and relevant rules and laws.[7,8] The technology has been used for a while in our hospital and has done a good job so far. The following features of the system represent its key benefits. It may offer real-time monitoring of prescriptions and medical orders and promptly alert users of the inappropriate use of pharmaceuticals, considerably enhancing the qualifying rates of prescriptions. According to the pertinent regulations in the "Prescription Administrative Policy" of WHO, medical institutions must set up prescription review systems, finish prescription review forms, implement dynamic monitor and abnormal warn for prescriptions, register and report irrational prescriptions, and intervene as soon as possible in irrational drug use.[9,10] To satisfy the needs of clinical pharmacy research, it will accurately and comprehensively implement the screening and statistical analysis of large sample cases.

Using prescription review as an example, the general surgery department's qualifying prescription rates, daily antibiotic use, and use of antibiotics in aseptic procedures were tallied and compared between 2010 and 2011. The outcomes both before and after CPMS use were mentioned below.

II. MATERIALS AND METHODOLOGY

Based on many case reports and several researches, in this literature Clinical Pharmacy Management System in drug discovery Processis discussed and reviewed.

Modern Pharmacy Management System

Traditional pharmacy management methods are employed in the majority of small and medium-sized pharmacies. The procedure includes manual ordering and purchase of medications, inventory control, expiration management, and sales billing. One of the most often used conventional pharmacy management systems is the usual paper-based pharmacy management system. The main drawback of this approach is how quickly papers might disappear or get corrupted. In addition, resources like time, money, and paper are wasted. Systems based on paper are static. Reprinting of whole inventory lists is necessary for even the smallest changes. In addition, a lot of human labor is required, which takes time from a pharmacist's standpoint. Over the past few decades, the rapid development of automated systems and computer technology has had a tremendous influence on how people conduct different business-related processes. This technology is currently pushing a number of industries to re-evaluate their whole management structure. Pharmaceuticals are one of the sectors whose company procedures utilize contemporary technology, making them much more practical and effective. There are several systems on the market that were created with the intention of managing pharmacies.

Pharmacy management systems are essential to the safe and effective delivery of healthcare services by pharmacies. Order entry for inpatient and outpatient therapy, inventory and purchase management, treatment management, response management, and clinical observations are the system's primary components [7, 8]. As a practical and workable solution that is tightly integrated into business processes, it eliminates medication mistakes, enhances patient safety and service quality, controls costs, reduces effort, and saves time [9, 10]. Systems that are not made to suit the needs and expectations of the users are rejected and deactivated. Therefore, it is crucial to involve the end user in the system's development.

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Laws that limit interoperability with other systems can make the process more difficult, expensive, and time-consuming [12]. E-prescription issues can be caused by a variety of issues, including inadequate strategic planning for technology adoption, a lack of IT support training, and a lack of collaboration among healthcare professionals [13]. Errors have a negative impact on efficiency and customer satisfaction. A safe, interoperable infrastructure is necessary for the system's success and sustainability. This infrastructure must be able to deliver network connectivity, internet, and electricity without interruption. The software, training services, and technical support provided by the supplier firm are all necessary for system security, data privacy, and confidentiality. Cost is the primary consideration for implementing a free pharmacy system [14]. A new system must be purchased, developed, and operated at a substantial investment [15]. To reduce service costs and enhance customer experiences, several pharmacies have invested in automated pharmacy management systems. Several tasks, including as inventory control and sales billing, are managed by the pharmacy management system[5]. The pharmacist should input the new stock information into the system after stock acquisitions. The system will handle all inventory management tasks automatically. When a client buys medicine, the inventory is automatically updated, and the data is saved for stock analysis in the future and to act as a reminder for future stock orders. The system also alerted the pharmacist about the availability of the drugs. The technology will let the pharmacist know if a certain brand of medication is not available. The prescription order was completed, and the cash register created a bill in line with the customer's instructions. All customer data that was submitted into the system was completely accessible to the management. There are now two different types of pharmacy management systems available on the market. There are several capabilities offered by these systems. The majority of pharmacy management systems must have a few key components in order to fulfill the pharmacist's duties. The drug dispensing procedure at a pharmacy is the one that is most connected to it. The dispensing procedure starts when the pharmacist gets the prescription from the patient (inpatient or outpatient) or provider. Patients' basic information, including age, address, phone number, and allergies, is gathered by pharmacies. They also record information on prescribers, known health conditions, and other important aspects of managing patient care. In order to prevent harmful drug interactions, pharmacists also keep records of their patients' prior prescription regimens [16]. Pharmacists should schedule the drugs for patients who take many medications for varied diseases, minimizing medication interactions through medication synchronization. There are several systems that offer inventory management features. These techniques help pharmacists rearrange items, return unused inventory, and keep a clean inventory, which ultimately results in cost savings on medicines that are left on the shelves [17]. Electronic data exchange (EDI), which enables the transmission of information regarding quickly moving drugs and price changes, is made possible by certain pharmacy management systems. Technologies exist that simplify the ordering of medications by automatically identifying when stock levels for a certain drug are low based on trends in prescription dispensing. Any organization must have effective financial management. The pharmacy sector experiences the same thing. Pharmacy management systems should be able to track and control the company's cash flow by providing owners with real-time information. Pharmacy management systems enable the creation of reports based on historical data for use in audit procedures, documenting patient information, and these reports may also be utilized for corporate intelligence and decision-making JCLMM1/11 (2023)|163-169 objectives. The management of drugs is the primary focus of the bulk of these systems. However, pharmacists provide a wide range of merchandise for sale in the retail sector. A customized pharmacy management system should therefore be able to manage additional inventory items while focusing largely on the distribution of medications. The system also has to be reliable and strong. In addition, it must to be easier for the typical user to utilize. A smart online pharmacy management system using a web-based application is suggested as a method to solve the limitations of currently available systems.

III. DISCUSSION

The sectors of pharmaceutical services and technology are closely related. The system must function at its best in order for the service to continue. System infrastructure, technical support, and other systems must consequently be interconnected. Stakeholders need to increase their collaboration and resolve problems if the system is to succeed.Pharmacists claim that utilizing a pharmacy management system has advantages such as "stock tracking," "financial

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tracking," and "simpler and error-free transactions."Key employee benefits of the pharmaceutical management system were “speedier and error-free processing,” “stock tracking,” and “prevent paper waste."Based on their unique expectations, obligations, and responsibilities as well as their use of different capabilities, the research finds that different professional groups score differently in terms of the areas where health information systems have been helpful [18].The three main problems experienced during medication provisioning on the Medulla screen were "disconnection," "screen freezing," and "system slowness." A pharmacy management system called Medula makes it possible for hospitals and the government to work together on billing and payment procedures[19]."Stock updates," "programme adjustments," and "invoice/receipt rectification" were the pharmacists' top three worries.The top issues, according to pharmacy staff, were "stock updating," "invoice/receipt correction," and "programme not responding."Garfield et al. [20] state that issues with the pharmacy system's inventory control and reimbursement module need to be fixed.Along with archiving, recovery, and data backup, as well as infrastructure, software, and hardware support, there is also data support and training to ensure the integrity of the system, as well as functional support for the many roles the system does.Due to a lack of support staff, small businesses have a larger need for technical help than large enterprises. As a result, the choice of system is influenced by the caliber of technical support[21, 22].In order to prevent customers from losing money and patients from becoming dissatisfied, pharmacists and pharmacy staff are judged on their capacity for problem-solving and communication.According to Garfield et al. [20], pharmacists may encounter patient disagreement brought on by systemic difficulties and make an effort to persuade them by outlining the circumstance. A very effective strategy for raising patient satisfaction with pharmaceutical services is communication. The effectiveness of the pharmacist-patient connection has a direct impact on the patient's level of satisfaction, according to Mehralian et al. [23].

IV. CONCLUSION

Pharmacy management systems are essential for minimizing errors and increasing productivity in the operations of making and distributing prescription drugs as well as managing patient care. As a result, it is crucial to concentrate on the information, procedures, and processes that the end user needs during the development and deployment of the system. The quality of pharmaceutical services improves with a fine-tuned pharmacy management system that meets with modern industry regulations. On the other side, a lack of infrastructure, technical assistance, and user education are among the main structural issues. Because of this, pharmacy staff and pharmacists firmly believe in the value of pharmacymanagement systems and regard them as a crucial part of pharmacy services, despite the system's usage difficulties.The quality of the supplier company's technical help should be raised.

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