JOURNAL OF INTERNATIONAL CRISIS AND RISK COMMUNICATION RESEARCH
ISSN: 2576-0017
2024, VOL 7, NO S11

The Role of Pharmacy in Modern Prescription Practices and Reduce Therapeutic Errors

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ABSTRACT

Pharmacy's role in the supply of medicines is critical to modern prescribing practice. Doctors can no longer see every patient who could potentially benefit from their skills, so they must write prescriptions for medicines. Safe and effective medicines are not the sole province of doctors. The input of pharmacists is essential to minimize therapeutic errors. Pharmacy is starting to become a protected title, with healthcare professionals being expected to be members of the General Pharmaceutical Council and operate from premises registered with the Council. Integrating pharmacy with healthcare means using quality processes that focus on outcomes. All of these put patients at the center of what we do, make the best use of available evidence, justify our decisions in public, take an active role in managing patients' medicines for the best effect, and minimize risks of harm. The development and use of legible electronic repeat dispensing requests, coupled with the possibility of electronic prescribing by community pharmacists for GPs to consider, are evidence of those developments. They should reduce risks that arise when patients exceed the limits of their medicines.

KEYWORDS: pharmacy, prescription, therapeutic errors.

1. Introduction

Pharmacy's role in the supply of medicines is critical to modern prescribing practice. Doctors can no longer see every patient who could potentially benefit from their skills, so they must write prescriptions for medicines. Safe and effective medicines are not the sole province of doctors. The input of pharmacists is essential to minimize therapeutic errors. Pharmacy is starting to become a protected title, with healthcare professionals being expected to be members of the General Pharmaceutical Council and operate from premises registered with the Council. Integrating pharmacy with healthcare means using quality processes that focus on outcomes. All of these put patients at the center of what we do, make the best use of available evidence, justify our decisions in public, take an active role in managing patients' medicines for the best effect, and minimize risks of harm. The development and use of legible electronic repeat dispensing requests, coupled with the possibility of electronic prescribing by community pharmacists for GPs to consider, are evidence of those developments. They should reduce risks that arise when patients exceed the limits of their medicines.

This review is intended as an overview. It is not possible to adequately address the question 'What is the role of pharmacy?' without first painting with a broad brush, but it is my intention to describe four themes in more detail below. Healthcare practice must be evidence-based, effectively using the results of research. This review falls into three of the four levels of evidence. The effect of these areas of practice on healthcare delivery can be measured using parameters that are of increasing importance to funders and professional bodies alike. I will address these in time. This is an area that needs more attention in the scientific literature.

2. Historical Evolution of Pharmacy Practices

The practice of pharmacy has been in existence since antiquity. Pharmacists were traditionally known as compounders; mixtures of medications were prepared by them in their homes and passed on from generation to generation for various ailments. The traditional persons who had the knowledge of medications were the retail pharmacists and the druggists. The attitude that medication could only help the patient if it was a single therapeutic, suitable for all cases, was still present in the 18th century. The scientific evolution was in its embryonic stage, and the young pharmacist also helped the families and their servants by administering simple medications to them. By the mid-20th century, the emphasis of veterinarians shifted to allopathic drugs, which could cure diseases. During the 18th and 19th centuries, many pharmacopoeias were published. Progress was aided by a detailed study of chemistry and the isolation of many natural drugs like codeine, morphine, cocaine, atropine, ephedrine, and caffeine. In the 1940s, the role of pharmacists within the framework of patient care, especially in relation to end-of-life therapies, was promoted. Over the years, the practice of pharmacy has undergone a series of evolutions. The first Federal Food, Drug, and Cosmetic Act regulated pharmacists. As pharmacists became more professional, pharmacy schools from the 1920s began to revise their curriculum into higher degree programs; this was a step towards the

Doctor of Pharmacy program, which was a 4 to 6-year program and is still getting stronger today. The development of pharmacy has been influenced by history and, in turn, has had an impact on the development of society. The change from traditional medicine or herbal to present-day synthetic drugs has been due to the development of chemistry from the early Greeks. The study of health clinical practices has long been a subject for active investigations, with a series of reforms put in place. These studies, policies, and structural changes have undergone positive improvements over the years. With these positive efforts, interactions between health professions have become more dynamic; thus, the roles of health professionals have been given attention that befits them in society to alleviate their suffering. Acquainting ourselves with the historical practices of the pharmacy profession will give us a background check on the professional attachment to the patient and their role in providing a resolution to clinical problems associated with drug use. As the patient's advocate, the relevance of the patient has become more pronounced over the years. Pharmacists have begun to participate in disease therapy selection and medication therapy management. Pharmacists' duties in all ramifications have been geared towards identifying, resolving, and preventing drug-related problems. The evolving role of the pharmacist can be better appreciated from a historical standpoint. This text tries to expose the reader to background facts about pharmacists amidst other health workers they have to work with.

3. Modern Prescription Practices

Modern prescription is a patient-centered approach and involves various components that are responsible for providing fast, safe, and efficient services. With the increasing number of protocols for hand qualification and the development of special programs, prescription handling in pharmacies has improved significantly. Technology plays a gigantic role in this regard, and software has proved to be a huge success. Now, doctors from hospitals, polyclinics, and private clinics all work in the same software and provide their prescriptions, which are directly delivered to the pharmacist located in the pharmacy below or within proximity. However, most private practice clinics and doctors do not work on the public services that the government provides. These are the average collections of the total clinics that include various kinds of practices. Currently, there are many promising practices in modern prescription and dispensing services that reduce the potential for medication errors.

In India, it is quite common for pharmacists to give suggestions about excipients, bioequivalence, treatment standard protocols, and drug costs with the brand name in the prescription. However, there are many well-qualified pharmacists who provide modern suggestions in prescriptions for therapeutic purposes, taking the patient from pain to a comfortable life. The role of the pharmacist is also outlined as a member of a healthcare team for Medication Therapy Management. Pharmacists in the Medication Therapy Management model have close involvement with physicians, nurses, nutritionists, and other healthcare providers in the evaluation, diagnosis, and treatment of each patient. MTM aims to optimize therapeutic results by obtaining the best medication outcomes through direct engagement with patients and family

doctors. This process starts with assessing the patient's medication needs in terms of efficacy and safety potential, evaluating from simple to complex case management. This process ensures minimal side effects and maximum medication adherence to achieve optimal therapeutic results for patients. Pharmacists who are currently not involved will only check for errors in prescriptions that are technically written. With the development of the practice of pharmacists currently, and the presence of MTM models, the role of pharmacists is not only limited to collaboration with doctors but also includes collaboration with patients and families. In addition, pharmacists' work will be adopted as a new system in examining errors in reading prescriptions that previously relied solely on treatment systems.

3.1. Electronic Health Records

Electronic health record (EHR) systems have become increasingly common in general practices as well as in community and hospital pharmacy settings. These systems enable instant and remote access to patient records, allowing much improved teamwork between professional healthcare staff and the close monitoring of prescriptions and resultant clinical outcomes. Although a range of EHR items can be identified, this review will concentrate on upcoming systems that manage patient records, facilitate the issuing of paper and electronic prescriptions, and manage medicine use reviews and dispensing. Such systems, particularly if integrated into the wider healthcare network, should reduce 'therapeutic errors' while enhancing communication between pharmacists and other healthcare professionals. (Bell et al.2020)(McGreevey et al.2020)(Cerchione et al.2023)

EHR can provide dynamic and real-time access to a patient’s medical dossiers and prescriptions. This can be invaluable in decision-making, supervising side effects, medicine compliance, and instigating changes in therapy. Clinical decision support can be provided to the prescriber by highlighting possible drug interactions, duplicate therapies, the presence of allergies, or recommending appropriate medicine based on the presence of a particular diagnosis. Pharmacists can support the prescriber in patient monitoring, medicines information, outcome evaluation for diseases and therapeutic interventions, and in patient coaching for self-management. Sending a care plan to a centralized EHR ensures that all subsequent levels of care professionals are aware of the pharmacy recommendations and have contributed to a continuing care management plan for the patient. Computerized Electronic Longitudinal Patient records can provide an excellent resource for conducting research both in primary and secondary care. They help in sending alerts to members of healthcare teams treating the patient, or via prompts in the prescriptions informing the patient to visit the GP. They can inform the pharmacists of the challenges the patient encounters with multiple dispensing visits in relation to therapy. Having a single record is so useful for all healthcare providers. They help increase the time for patients, improve workflow efficiencies, and reduce paperwork burden. They provide a wider range of services through initiatives and advances in IT. They also support new ways of delivering services and improve the availability of information on which patient care decisions are based. In the future, they will deliver a platform for wider access to patient-centered services. Electronic Longitudinal Patient records track patient care by linking to existing record systems. They use timestamps to

correlate displays in a common time frame, offering a single view of a patient's care. They hold collections of records linked through formal guidelines. They have smart and rich semantics to enable primary care data integration, automatic disease progression labeling, audit, and research. They provide caregivers not only with currently available traditional records, but they also channel alerts and links to newsgroups drawing on international knowledge and patient educational records. They provide audit and research opportunities, including outcomes research. They are global systems to improve patient care that are interoperable with other existing electronic health record systems.

3.2. Pharmacist Involvement in Medication Therapy Management

Medication therapy management (MTM) is a term used to describe services that seek to optimize therapeutic outcomes for individual patients. Pharmacists assess whether medication regimens are appropriate and effective for a given patient, checking for potential problems such as drug-drug interactions, drug-disease interactions, duplication of therapy, subtherapeutic dosage, overuse, medication adherence, medication abuse, misuse, and professional guidelines adherence. When problems are identified, the pharmacist works with the prescriber to modify the medication regimen via drug initiation, dose changes, medication discontinuation, or medication switch. In general, MTM also involves counseling and providing education to patients for the ultimate goal of promoting medication safety and preventing, reducing, and resolving drug-related problems.

MTM programs are effective tools for managing chronic disease states. An association between MTM programs and positive health outcomes has been established in disease states such as hyperlipidemia, diabetes mellitus, and hypertension, in addition to therapy related to medications for geriatric patients. Study subjects also demonstrated improved adherence to therapy, optimized pharmacotherapy, promotion of safe therapeutic pharmacotherapy practice, and eventually, a reduction in preventable therapeutic errors and unnecessary healthcare utilization. MTM is considered a critical component in assuring the quality and appropriateness of care provided to beneficiaries by preventing errors and reducing costly medical events in the future. By including these programs, MTM offers health plans the opportunity to partner with pharmacists and their patients to make the most of medications. Pharmacists can utilize MTM services to establish one-on-one relationships with patients and help ensure appropriate, safe, and cost-effective management of medication. These one-on-one relationships can help improve the patient's understanding of medication compliance, reduce the likelihood of the patient discontinuing the therapy, and ultimately impact patient outcomes. The net result is better care coordination among the healthcare team, which contributes to improved care and lower costs. In addition, the health plan receives data pertinent to chronic care management, which contributes to clinical performance improvements. In summary, MTM will improve the members' quality of life through better medication therapy management and will control the ever-increasing cost of the healthcare system.

4. Reducing Therapeutic Errors

The occurrence of therapeutic errors causes a great deal of anxiety for health care practitioners; they believe that it poses a risk to patients. Recent studies show that at least 6.5% of inpatients will be exposed to some type of therapeutic error, making the hospital a hazardous place. It is generally accepted that the majority of these errors are preventable, given the risk assessment techniques, and it is estimated that 20%–50% are indeed preventable. In terms of prevention of therapeutic errors, it is necessary for us to take a systematic approach, looking at the various aspects of prescription writing, dispensing, administration, patient education, and monitoring. One common cause of therapeutic errors is the inaccurate or incomplete recording of medication histories and patient medication lists. Also, multidomain approaches to prevent therapeutic errors in the elderly include systematic medication review strategies, especially concerning medicines and frail elderly, dissemination, and clinical training.

The need to undertake medication reconciliation becomes more pressing as patients increasingly assume responsibility for the management of their own medications. Some patients do not have the education, knowledge, or mental acuity to effectively manage their medications safely. Comprehensive, multidisciplinary systems to prevent therapeutic errors and harm directly related to medication use are in evidence in many countries. There are many stakeholders in the broader systems to manage medications and reduce the potential for therapeutic errors. In the Australian context, these include various health organizations and the Australian Government. To further protect the population, a sentinel event alert approach to error reporting for therapeutic errors will shortly be introduced. While these systems offer protection, they are limited and should, and are, under continuous review and improvement.

4.1. Medication Reconciliation

Medication reconciliation has been defined as the process of creating the most complete and accurate list of all medications a patient is taking and comparing that list with the physician's admission, transfer, and/or discharge orders, with the goal of providing correct medications to the patient at all times. This process includes obtaining a comprehensive medication history, including prescription medications, over-the-counter products, complementary and alternative medications, nutritional supplements, eye drops, inhalers, patches, acupuncture, and currently or previously taken investigational drugs. It is a process now recommended by various healthcare organizations.

Successful medication reconciliation is the process of overcoming the obstacles associated with pharmacotherapy history and its listing of inaccuracies with the verifiable facts. Pharmacy should be useful in communication with other responsible persons and health professionals within pharmacy, such as nursing staff and doctors. In medication reconciliation, pharmacists have an important mission because they are the ones who identify the discrepancies of medications taken by the patient with a list of prescription drugs that will be given by the treating physician. Successful medication reconciliation also has an impact. Research stated that medication reconciliation managed to reduce what is called a medication error or an adverse

drug event. An adverse drug event can be fatal to the patient. In 2000, about 769,000 adverse drug events occurred in U.S. hospitals. Some of this amounted to a very large impact; it is about $5.6 million per year for a 700-bed hospital. If it is changed to cause re-entry treatment of $28,000 per patient and a 5-day longer stay in the hospital.

4.2. Patient Education and Counseling

Patient Education and Counseling of the Patient. Providing clear, accurate, and up-to-date information along with educational services to individual patients are major functions of pharmacy. Patients who understand how to use their medication properly and the possible side effects from taking them are less likely to experience accidental therapeutic errors. Pharmacists are the health professionals best suited to provide this service, and in the modern pharmacy, they often take the time to talk to patients about possible side effects and adherence strategies. Counseling is another role of the pharmacist in relation to reducing dispensing errors.

The modern pharmacist offers much more than information on how to use a particular medicine. Rather, the pharmacist, through developing an open relationship with the patient, provides general information on disease state management. Pharmaceuticals are only one of a range of potential therapeutics available for patient management or to be used preventatively. Not every patient will want to know about the latest drug release, and in some situations, a more appropriate intervention may involve a lifestyle change, nutrition, physical exercise, or a combination of these with pharmaceuticals. The criteria used to assess the appropriateness of the advice provided should center on the individual, ensuring that the level of explanation and the advice given relate to every aspect of the individual's currently known medical history. That is, the information provided should allow the patient to participate fully in the medical decision-making process, with the facility to ask questions and make counter-suggestions. Providing patients with the information to enable informed consent is one of the major outcomes in patient education and counseling. When consulting with a patient, the pharmacist can impart a multitude of other information. For example, a member of the public attending their local pharmacist for advice may appear outwardly well but may have a personality that is inwardly insecure and lacking in confidence to engage with their doctor in conversation. Drug-related education regarding medication use, pharmaceutical preparations, purpose for medication, dosage form, dosing instructions, common side effects, dosing schedule, possible interactions, and self-monitoring instructions is basic to any pharmacy practice.

Patients should be conversed with at all times in the language and style of other health professionals such as nurses and general practitioners, using appropriate clinical terminology. Part of the strand of medical education is to provide information that can be empowering and will provide a sense of efficacy to patients. In providing such counseling, it is important to have respect for the patient's autonomy and dignity, to allow the patient to determine the course of therapy, and to involve the patient in decision-making about their care. This respect is clearly articulated in competent principles attached to professional practice leading to professional accreditation. Empowerment is a powerful term often associated with a

partnership-based approach to health care. When applied in the context of counseling patients, it highlights the importance of giving individuals the tools, knowledge, and resources to voice their concerns, ask questions, and actively take part in their own medication and health outcomes, including the adverse events that may be expected if these outcomes are not achieved. There are positive aspects to the approach of empowering people with education about adverse events and enabling them to be decision-makers and more self-reliant in the role of teacher/patient partnership. Empowerment through a patient-centered partnership enables individuals to feel free in asking questions, making decisions, and taking steps towards a solution. It fosters a patient-centered partnership where the patient is allowed to express their fears, and autonomy remains integral, in addition to maintaining a balance.

5. Technological Advancements in Pharmacy

Advances in technology are contributing to improvements in the work carried out by pharmacists in prescription. Perhaps the most significant technological innovation in hospital pharmacy was the introduction of computerized order entry. The impact of automated dispensing systems on hospital pharmacy practice is significant. Automation systems streamline workflow and enhance inventory management. Operational efficiencies gained through the use of automation can improve the quality of service provided, for example, by the reduction of wait times in an outpatient department.

Because of the potential to reduce human error, automated dispensing systems are increasingly being installed in hospital pharmacies. The occurrence of therapeutic errors is highest at the prescription or administration stage; therefore, investing in systems that reduce error at other stages of the process is crucial to error reduction. Developments in telepharmacy are providing new avenues to deliver pharmacy services to remote and rural populations, as well as those requiring enhanced access to consumer medicines following a consultation with their pharmacist.

Technology has the capacity to improve accessibility to health professionals and the capacity for health and demographic data to be shared across the health sector. Telepharmacy is pharmacy service delivery through the use of telecommunications and internet technology. The most significant characteristic of telepharmacy is the enablement to conduct real-time video and audio consultations and treatment sessions between the pharmacist in a central pharmacy and a patient in another pharmacy, community health center, or a patient's location such as home. It uses secure messaging, digital pictures, and video conferencing to address consultation services. In addition to separating the patient from the pharmacist, telepharmacy technology can provide visual access to images, audio interaction, and facilitate better communication between the patient and pharmacist, which is imperative to optimal healthcare management. Telepharmacy activity is primarily an adjunct to augmenting the availability and skills of pharmacists within the existing pharmacy workforce. Only pharmacists who meet the requirements of the industry regulator are able to provide services through a network using telepharmacy to a client or patient.

5.1. Automated Dispensing Systems

Automated dispensing systems are evolving and have come as a replacement for the traditional methods of medication distribution used in the past. These systems serve several purposes that are important to modern pharmaceutical bonds, including efficiency and safety. One important advantage of using these new types of dispensing systems relates to therapeutic errors, which are a significant problem. It is well documented that one source of these errors is the actual process of preparing or dispensing the medication. If human intervention could be minimized in this area, it would serve to increase patient safety.

Automated dispensing systems reduce the number of steps required in the medication distribution process, and they often contain safeguard mechanisms that ensure that the correct medication, dose, and formulation are conveyed. The latest technology used in these systems is also integrated with the pharmacy's inventory, which serves to notify personnel when inventory is low. The dispensing process can occur more quickly without these interventions, thus increasing the efficiency of the process as well. Expired, unused, or unwanted medications can also be readily identified and be subject to removal so that a pharmacy is not using valuable space to store these materials. Despite these advantages, such systems may not be without some limitations. They are relatively expensive initially, and the cost needs to be taken into account during the budget process. In addition to the expense, these systems require continuous maintenance after they are installed, and personnel need to be continually trained even after the system has been in operation for several years.

Systems have increased staffing efficiency through an initial reduction of technician labor hours and have resulted in significant savings in a three-year period when the initial investment was substantial. Introducing an ADS machine resulted in a doubling of the amount of medication dispensed in a reduced amount of time in one case study. Another study revealed a doubling of volume through automated dispensing. In addition, pharmacies have found automated dispensing to be necessary in order to maintain efficient workflow and reduce prescription backlogs. Automated dispensing systems provide numerous advantages to the operation of community pharmacy. Systems can result in error reductions in the dispensing process while freeing up staff time to render counseling services. They can easily be used to track sales data, control inventory, and lead to quick, efficient processing of prescriptions. Maintaining and outfitting the physical pharmacy and personnel with new skills are crucial to the smooth implementation and operation of ADS.

5.2. Telepharmacy Services

Telepharmacy services are reshaping pharmaceutical care in communities with one or no pharmacies. Telepharmacy uncouples the pharmaceutical dispenser from the pharmacist, allowing pharmacists to use technology to overcome geographical impediments. These telepharmacy services offer many facets of remote pharmaceutical care. They often use pharmacy technicians to handle basic tasks such as receiving new and refill medication orders, blister packing compliantly, counseling on their respective medication areas such as glucose monitoring, and contacting patients to schedule delivery confirmations. After the dispensing

technician has packaged the medication, a remote pharmacist examines the new order or changes to existing orders for any therapeutic duplication or contraindications prior to authorizing delivery. (Almeman)(Rezahi et al.2021)(Bester, 2023)

These services accomplish several of the goals placed forth by patient-centered care. Often, the interactive telecare between technician and patient occurs within the patient's home, preventing confusion caused by more impersonal video consultations from public areas. After being packaged, all contact is by a licensed pharmacist, with personal messages and counsel from that pharmacist written onto sticker sheets that go on the packages. An important reservation unique to telepharmacy is that many of our existing legal requirements do not encompass or relate to telepharmacy services. New rules and oversight provisions would need to be enacted and reaffirmed to account for telepharmacy services. The role of the pharmacist is maturing now to meet the demands of floated telepharmacy services and telecare. Pharmacists will continually and proactively communicate with patients, researching medicine, the disease state, and the information necessary to ensure effective adherence coaching.

6. Conclusion

The key role of pharmacy in modern prescription practices is generally overlooked by health policy leaders, administrators, and academics. Reducing therapeutic errors is an important task to minimize the opportunities for patients to experience debilitating effects and death. There are various methods to reduce therapeutic errors; however, reducing the occurrence of therapeutic errors is an important task of pharmacy because of its clinical perspective and accessibility in healthcare settings. Technology, including electronic health records and information systems, has a growing role in the operation of the pharmacy. Automated systems, such as barcode readers, provide a double-check system to reduce the frequency of dispensing therapeutic errors.

Pharmacists play an important role in pharmaceutical application, and it is imperative that they provide patient-specific pharmaceutical care. It is also noteworthy that the important role of pharmacy has been reviewed to reveal its vital role in the innovation of healthcare management services. The changing healthcare arena demands the ongoing education and training of pharmacy professionals. Much work remains to be done to provide the academic and experiential background for the new curricular outcomes. As part of a healthcare team, pharmacists play a critical role in ensuring medication use that is safe and effective. Research and practice focus on developing and implementing pharmacist-provided patient care services that enhance patient safety and optimize therapeutic outcomes.

In conclusion, to maintain an effective role in a rapidly changing healthcare system, pharmacy must continue to focus on these areas. To provide effective healthcare services, such as dispensing, pharmacy should move forward and increasingly use science and innovation to guide pharmacy practice at the individual patient level. Researchers should also concentrate on innovating and producing new evidence-

based findings and perceptions to assist pharmacy in evolving to deliver pharmaceutical care. To appeal to this brief portrayal of the value of pharmacy worldwide, it is evident that a major concern for a highly effective health system is the influence of pharmacy.

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