
THE PLACE OF INFORMATION AND COMMUNICATION TECHNOLOGY IN PHARMACY

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ABSTRACT

Information and communication technologies (ICTs) in pharmacy are transforming health services throughout the world. The geographical diversity is also a challenge for the implementation of ICT everywhere. ICTs can further enhance the quality of pharmacy. ICT can be utilized in health care to improve the quality of patient-centric services. The use of ICT has many advantages for the pharmacist and patients, including cost savings, convenience, accessibility, and improved privacy and communication. The study concluded that the adoption of information and communication technologies in pharmacy is essential for enhancing both the efficiency and effectiveness of the decision-making process. Most operations in pharmacies have been taken over and handled more efficiently by the application of software packages. Adoption of ICT has continued to change the product structure, content, and quality of operations. However, the place of information and communication technology in pharmacy has information on the types of information and communication technology devices relevant to the pharmaceutical industry, especially for their operations. One of the recommendations made was that the government and pharmaceutical industries should frequently review the ICT facilities in use in their companies and avail themselves of the modern ICT facilities.

KEYWORDS: ICT and Pharmacy

Introduction

Information and communication technologies (ICTs) in pharmacy are transforming health services throughout the world. The geographical diversity is also a challenge for the implementation of ICTs everywhere. Information and technologies are giving us a way to access data all over the globe. ICTs have revolutionized pharmacy all over the world. Information and technologies are removing barriers to learning pharmacy. According to Sunil and Rai (2018), ICT applications are becoming indispensable tools for traditional and vocational education. In the field of pharmaceutical sciences, ICTs can further enhance the quality of pharmacy. ICT can be utilized in health care to improve the quality of patient-centric services. Pharmacists have been among the first healthcare professionals to introduce new technologies in medicine in different fields, including telemedicine related to medication

counseling, drug design, and clinical decisions (White & Hohmeier, 2015). Information and communication technologies (ICT) are widely used in health care as a result of pharmaceutical informatics and technology developments. There is a huge potential for pharmaceutical practices to utilize technologies in different practice settings, especially community pharmacy and patient counseling.

Pharmacy, as an integral part of the healthcare ecosystem, has seen a steep rise in the use of technology in various ways around the world. Using ICT in pharmacy can benefit patients, pharmacists, and business owners by optimizing tasks, increasing efficiency, and reducing medication errors (Bhumika, 2021). Using technology in pharmacy is very useful for the pharmaceutical profession. It improves the pharmacists' work and gives them more time to help the customers. Using computers reduces the time, expenditure, and manpower required for any kind of work. Using computers is useful for patient profile monitoring, drug interactions, medication, database management, material management, drug information services, patient counseling, billing, and purchasing. The bar codes on the bottles and containers allow the pharmacies to record the drugs and compounds that they have on hand and the quantities of them. They help to confirm that the right product has been delivered, stored, retrieved, and dispensed to the customers. This ensures the safety and quality of drugs for medical professionals and, ultimately, patients (Mary, 2022). ICT, or information and communications technology (or technologies), is the infrastructure and components that enable modern computing.

Statement of Problem

It is obvious that information technology utilization in pharmacy improves both clinical and commercial outcomes. Even with all the advantages, technology adoption resistance is still all too typical. This might be believed to be mostly due to the expense of the necessary infrastructure, training, and time for technological adaptation. In contrast to other businesses, the pharmaceutical and healthcare sector has several regulatory and compliance issues, which is another key factor in the resistance. One of the most pressing issues in pharmacy practice is the ability to collect and analyze data available in the community. Information and communication technology has a position in pharmacy.

Concept of Information and Communication Technology

Information and Communication Technology (ICT) refers to an extensional term for information technology (IT) that stresses the role of unified communication and the integration of telecommunication (telephone and wireless signals) and computers, as well as necessary enterprise software, middleware, storage, and audiovisual, that enable users to access, store, transmit, understand, and manipulate information (Murray, 2011). According to Ozdamli and Ozdal (2015), ICT is the convergence of audiovisual and telephone networks with computer networks through a single cabling or link system. There are large economic incentives to merge the telephone network with the computer network system using a single unified system of cabling, signal distribution, and management. ICT is an umbrella term that includes any communication device, encompassing radio, television, cell phones, computer and network hardware, satellite systems, and so on, as well as the various services and appliances that go with them, such as video conferencing and distance learning. ICT also includes analog technology, such as paper communication, and any mode that transmits communication. Furthermore, Mary (2022) stated that ICT, as a general term, used to represent a broader, more comprehensive list of all components related to computers and digital technologies than IT. The list of ICT components is exhaustive, and it continues to grow. Some components, such as computers and telephones, have existed for decades. Others, such as smartphones, digital TVs, and robots, are more recent entries. ICT commonly means more than its list of components, though. It also encompasses the application of all those various components. It's here that the real potential, power, and danger of ICT can be found. ICT also encompasses both the internet-enabled sphere as well as the mobile one powered by wireless networks. It also includes antiquated technologies like landline

telephones, radio and television broadcasts, which are still widely used today alongside cutting-edge ICT components like artificial intelligence and robotics. ICT is sometimes used synonymously with IT (for information technology).

It can also simply be defined in its simplest form as an electronic medium for creating, storing, manipulating, receiving, and sending information from one place to another. It makes message delivery faster, more convenient, and easier to access, understand, and interpret. It uses gadgets such as cell phones, the Internet, wireless networks, computers, radios, televisions, satellites, base stations, etc. These resources are used to create, store, communicate, transmit, and manage information (YO University TV, 2017). It is also known as a technology that supports activities involving information. Such activities include gathering, processing, storing, and presenting data. Increasingly, these activities also include collaboration and communication. In other words, information and communication technology, or ICT, is defined as the combination of informatics technology with other, related technologies, specifically communication technology. ICT is the use and applications of computers, telecommunications, and microelectronics in the acquisition, storage, retrieval, transfer, and dissemination of information. However, today, the definition of information and communication technology (ICT) is much broader, encompassing nearly every type of business, education, etc., from manufacturers, retailers, banks, and publishers to research firms, medical institutions, law enforcement agencies, government companies, and libraries for their daily activities.

Concept of Pharmacy

Pharmacy, according to Thomas (2018), is the clinical health science that links medical science with chemistry and is charged with the discovery, production, disposal, safe and effective use, and control of medications and drugs. The practice of pharmacy requires excellent knowledge of drugs, their mechanism of action, side effects, interactions, mobility, and toxicity. At the same time, it requires knowledge of treatment and an understanding of the pathological process. Some specialties of pharmacists, such as that of clinical pharmacists, require other skills, e.g., knowledge about the acquisition and evaluation of physical and laboratory data. The scope of pharmacy practice includes more traditional roles such as compounding and dispensing of medications, as well as more modern services related to health care, including clinical services, reviewing medications for safety and efficacy, and providing drug information. Pharmacists, therefore, are the experts on drug therapy and the primary health professionals who optimize the use of medication for the benefit of patients. An establishment in which pharmacy (in the first sense) is practiced is called a pharmacy (this term is more common in the United States) or a chemist's (which is more common in Great Britain, though pharmacy is also used). In the United States and Canada, drugstores commonly sell medicines as well as miscellaneous items such as confectionery, cosmetics, office supplies, toys, hair care products, magazines, and occasionally refreshments and groceries. In its investigation of herbal and chemical ingredients, the work of the apothecary may be regarded as a precursor of the modern sciences of chemistry and pharmacology, prior to the formulation of the scientific method. Pharmacy is also the art, practice, or profession of preparing, preserving, compounding, and dispensing medical drugs. It is also a place where medicines are compounded or dispensed (Merriam-Webster Incorporated, 2022).

According to Smith (2019), there are many different types of pharmacies and other places where a trained pharmacist may work. To mention but a few, they include:

1. Community pharmacy
2. Hospital pharmacy
3. Clinical pharmacy
4. Consulting pharmacy

Community Pharmacy: Also known as a retail pharmacy, the community pharmacy is the most well-known type of pharmacy. It is this type that is most traditionally known as the "pharmacist" or "chemist" shop. A community pharmacist usually works in a store that provides the community with access to the medications they need, as well as advice to promote the safe and effective use of the medicines they provide (Smith 2019).

Hospital Pharmacy: A hospital pharmacy is the place where the management of medications occurs in a hospital, medical clinic, or nursing home. A hospital pharmacist often works in close collaboration with other health professionals to ensure that the medication regimen for each patient is optimized to achieve the best outcomes.

Clinical Pharmacy: The clinical pharmacy exists in a number of settings, including hospitals, nursing homes, and other medical centers. The aim of clinical pharmacy is to ensure the optimal use of medications for the best outcomes through the provision of drug information and monitoring for drug safety and efficacy.

Consulting Pharmacy: The consulting pharmacy is a relatively new branch of pharmacy, born in 1990. It focuses on the theoretical review of medications rather than dispensing medicines. Consultant pharmacists often work in nursing homes or visit patients at home to provide their services in order to enable them to use medications most effectively (Smith 2019).

Effect of Information and Communication Technology (ICT) in Pharmacy

The use of ICT has many advantages for the pharmacist and the patient, including cost savings, convenience, accessibility, improved privacy, and communication. The resource persons are expected to primarily discuss the importance and consequences of ICT in pharmacy practice. It is too obvious to anyone that the use of information technology is revolutionizing every part of our traditional ecosystems, from businesses to travel to how we interact with each other and the world. According to Bhumika (2021), the healthcare system is no different. Around the world, from diagnosis to care to prescription and monitoring, information technology is rapidly being incorporated into the healthcare system for the better. Pharmacy, as an integral part of the healthcare ecosystem, has seen a steep rise in the use of technology in various ways around the world. How ICT is used in pharmacy can benefit patients, pharmacists, and business owners by optimizing tasks, increasing efficiency, and reducing medication errors. Information technology (IT) can be used to various ends in pharmacy. From generating computerized bills to handling inventory and automating the supply chain, the use of IT in pharmacy can replace mundane manual tasks. Software with Business Intelligence (BI) can be used to help pharmacy business owners take data-based decisions to ultimately maximize business outputs and minimize losses. The computers can help run the business operations efficiently. They make it easier to handle routine business tasks such as recording, tracking, and paying vendor bills. The computers can improve patient safety; they help to provide high-quality care; and they help the patients make the most of their medicines as they provide the tools for monitoring the efficacy and safety of medicines in use (Soffar, 2015). Furthermore, the use of mobile technology to remind patients to refill their prescriptions and the use of digital communication technology to provide healthcare consultations remotely are two examples of how ICT has the potential to change the system. Manual, repetitive tasks like managing inventory, communicating with vendors, and keeping track of expired products usually take a lot of effort and time in the pharmaceutical retail chains. Use of technology automates and standardizes redundant and manual tasks, which in turn saves a lot of time for the pharmacists, giving them more time to engage in patient counseling. Also glaring are the medication errors that happen too often. It is believed that after prescribing, dispensing is another vital step where there is a rather high possibility of medication errors. These human errors that can have a big impact on a patient's health can be avoided by the use of information technology (Bhumika, 2021).

Another role of information technology is proper documentation of data. This could range from patient health records to medication histories to sales record data. This data helps health care professionals make better clinical decisions. Similarly, it also helps pharmacy business owners make better business decisions. For instance, the annual sales record of a medicine at a certain time of the year can be of immense help to the business owner in making decisions regarding procurement and sales strategy for the medicine in coming years. Information technology can help business owners make evidence-backed decisions to gain better outcomes by minimizing loss. Furthermore, Bhumika (2021) stated that, in this way, the use of information and communication technology in pharmacy can contribute to both a better patient experience and some better clinical and business outcomes for pharmacists and pharmacy business owners, respectively. It is evident that the use of information technology in pharmacy yields better clinical and business outcomes. Despite all of the benefits, there is still a lot of resistance to adopting technology. It can be assumed that this is mostly because of the cost associated with the infrastructure, training, and time it takes to adapt to the technology. Unlike other industries, the pharmacy and healthcare industry also faces many regulatory and compliance challenges for technological transformation, which is another main reason for the reluctance. However, the industry at large should understand that making a quick shift to technology to replace hands-on manual tasks might seem intimidating and costly at first, but in the long run, the overall benefits weigh much more and ultimately work in the favor of business. Taking small steps towards incorporating technology in pharmacy can be financially feasible for pharmacy business owners who are not willing to do it all at once (Soffar, 2015). The computers are useful for the hospital and clinical pharmacy, the pharmaceutical analysis, the diagnosis, and the data analysis; they can store the patient records, and they facilitate electronic prescribing.

Conclusion

The study concluded that the adoption of information and communication technologies in pharmacy is essential for enhancing both the efficiency and effectiveness of the decision-making process. Most operations in pharmacies have been taken over and handled more efficiently by the application of software packages. Adoption of ICT has continued to change the product structure, content, and quality of operations. However, the place of information and communication technology in pharmacy has information on the types of information and communication technology devices relevant to the pharmaceutical industry, especially for their operations.

Recommendations

1. The government and pharmaceutical industries should frequently review the ICT facilities in use in their companies and avail themselves of modern ICT facilities.
2. Pharmacies should sooner or later up their game in technology if they are to thrive, or even survive, in the healthcare ecosystem.
3. By streamlining processes, boosting productivity, and eliminating prescription mistakes, the government and pharmaceutical companies should implement ICT for the benefit of customers, pharmacists, and company owners.

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