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The Role of New Technology in Pharmacy, Nursing and Medical Field for the Improvement of Healthcare System

			
<p>Ritesh D. Vyavahare*, Trushali Mandhare, Kishor V. Otari, Pankaj Khuspe, Nangare Priyanka</p> <p><i>Navsahyadri College of Pharmacy, Pune, 412213.</i></p>			
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ABSTRACT

Now a day's healthcare sector is very important and growing sector throughout worldwide. In healthcare sector Pharmacist, physician, and nurses play an important role in the growth and development of this sector. If we Pharmacist, Physician, and nurses utilize more advanced technology to improve our healthcare system. The article describes a brief introduction explaining Recent Technology in the profession of Pharmacy and Medical field in the health care system and the important role of a Pharmacist and physician. Pharmacy is the science and technique of preparing and dispensing drugs. This is a health profession that links health sciences with chemical sciences and it aims to ensure the safe and effective use of Pharmaceutical drugs. Along with compounding and dispensing role of the pharmacist is to use of computers, internet, Electronic prescribing system, identification of barcode on medicine, modern Mobile technology, Adherence monitoring, telecare, clinical services, reviewing medications for safety in addition, efficacy, and providing drug information. The role of Pharmacy goes towards the preparation of drugs and development of new drugs, while, Clinical Pharmacy is going towards the analysis of population needs about medicines, ways of administration, patterns of use and drugs effects on the patients. Modern healthcare system provides high-quality care, patient's safety; reduce the traveling times of patients and cost of healthcare professionals. So, the focus of attention moves towards the application of different new technology in the field of pharmacy and medical for the improvement of the healthcare system in Society.

INTRODUCTION

In today's world, every industry and people, technology plays an important role. Out of all of the industries, healthcare is definitely one of the most important. Healthcare system is responsible for improving and saving so many lives all around the world. Medical technology is a large field where new creations play an important role in sustaining health. Areas like biotechnology, pharmaceuticals, IT, the development of medical devices and other equipment, and more have all made significant contributions to improving the health of people all around the world. From "small" innovations (e.g. adhesive bandages and ankle braces) to larger, more complex technologies like MRI machines, artificial organ transplantation, technology has definitely made an incredible impact on the medical field.

In the healthcare industry, the dependence on medical technology cannot be overstated, and because of the development of these talented innovations, healthcare physician can continue to improve their practice – from better diagnosis, surgical procedures, and improved patient care.

IT and Medicine

Information technology has played an important role in our world, mostly in the healthcare sector. With the increased use of electronic medical records (EMR), telehealth services, and modern mobile technologies like tablets and smartphones, doctors and patients are both seeing the benefits that these new medical technologies are changing their healthcare sector. Medical technology has evolved from introducing doctors to new equipment to use private practices and hospitals to connecting patients and doctors thousands of miles away through telecommunications. It is very easy to take video conference in between doctor and patients in today's world, to save time and money normally spent on traveling to another location. With more and more hospitals and practices using medical technology like mobile devices on the job, physicians can easily access to any type of information they want – from drug information, adverse reaction research and studies, patient history or records, and more by using the internet. In addition, with the ability to effortlessly carry these mobile devices around with them throughout the day, they are never far from the information they need. Applications that aid in identifying potential health threats and examining digital information like X-rays and CT scans also contribute to the benefits that information technology brings to medicine.

Medical Equipment Technology

Improving the quality of life is one of the main benefits of integrating innovations into medicine. Medical technologies like minimally invasive surgeries, better monitoring systems, and more comfortable scanning equipment are allowing patients to spend less time in recovery and more time enjoying a healthy life. The integration of medical equipment technology and telehealth has also created robotic surgeries, where in some cases; physicians do not even need to be in the operating room with a patient when the surgery is performed. Instead, surgeons can operate out of their “home base”, and patients can have the procedure done in a hospital or clinic close their own hometown, eliminating the hassles and stress of health-related travel. With other robotic surgeries, the surgeon is still in the room, operating the robotic devices, but the technology allows for a minimally invasive procedure that leaves patients with less scarring and significantly less recovery time.

Technology and Medical Research

Medical scientists and physicians are constantly conducting research and testing new procedures to help prevent, diagnose, and cure diseases as well as developing new drugs and medicines that can lessen symptoms or treat ailments. With technology in medical research, scientists have been able to examine diseases on a cellular level and produce antibodies against them. These vaccines against life-threatening diseases like malaria, polio, MMR, and more prevent the spread of disease and save thousands of lives all around the globe. In fact, the World Health Organization estimates that vaccines save about 3 million lives per year, and prevent millions of others from contracting deadly viruses and diseases.

Medical Science is significant for the perfection of human life, lifespan, and quality of human life. It helps to prevent human suffering and cures the diseases that are the result of advancing civilization. It is helpful to develop new drugs, new techniques and new equipment's to study, analyze and cure the diseases

The Role of Pharmacy in Providing Healthcare Services

Community pharmacists are the health professionals most accessible to the public. They supply medicines in accordance with a prescription or when legally permitted, sell them without a prescription. In addition to ensuring an accurate supply of appropriate products, their professional activities also cover counseling of patients at the time of dispensing of

prescription and non-prescription drugs, drug information to health professionals, patients and the public, and participation in health-promotion programmes. They maintain links with other health professionals in primary health care. Today, an increasingly wide range of new and analogous products is used in medicine, including high-technology biological products and radiopharmaceuticals. There is also the heterogeneous group of medical devices, which includes some products analogous to medicines, some of which demand special knowledge with regard to their uses and risks (e.g., dressings, wound management products, etc.). Pharmacists are also becoming increasingly involved in a variety of processes around medicines use known broadly as ‘medicines management’; for example, pharmacists have been involved in the management of general practice repeat prescribing systems.¹ Pharmacists have progressively undertaken the additional task of ensuring the quality of the products they supply. They have also undertaken clinical medication reviews of older people in their own homes and in residential care and of patients with specific long-term conditions, such as heart failure²⁻⁴.

The main activities of community pharmacists are described below.

Processing of prescriptions

The pharmacist verifies the legality, safety and appropriateness of the prescription order, checks the patient medication record before dispensing the prescription (when such records are kept in the pharmacy), ensures that the quantities of medication are dispensed accurately, and decides whether the medication should be handed to the patient, with appropriate counseling, by a pharmacist. In many countries, the community pharmacist is in a unique position to be fully aware of the patient’s past and current drug history and, consequently, can provide essential advice to the prescriber. The assumption of new roles by pharmacists is part of a global trend, with many of these new services falling under a broad rubric of ‘cognitive pharmaceutical services’⁵.

Care of patients or clinical pharmacy

The pharmacist seeks to collect and integrate information about the patient’s drug history, clarifies the patient’s understanding of the intended dosage regimen and method of administration, and advises the patient of drug-related precautions and in some countries, monitors and evaluates the therapeutic response. Community pharmacists can now opt to provide a wide range of ‘advanced and enhanced pharmaceutical services’ which include

medicines use reviews; anticoagulant monitoring services; disease-specific medicines management services; care home services; stop smoking services; supervised administration services (mainly for methadone); medicines assessment and compliance support services; prescriber support services; and screening services⁶.

Monitoring of drug utilization

The pharmacist can participate in arrangements for monitoring the utilization of drugs, such as practice research projects, and schemes to analyze prescriptions for the monitoring of adverse drug reactions. Since pharmacists have acquired the capacity to recommend or prescribe more medicines without reference to a doctor and have taken on these new roles, their effectiveness has come under some scrutiny⁷. Similar concerns have been expressed in the past about whether pharmacists are applying evidence to the dispensing of over-the-counter medicines; for example, topical antifungal in vaginal candidiasis⁸. Findings of misuse of medicine are difficult to explain particularly in older people, is associated with morbidity and mortality, and the obvious role for pharmacists to address this issue. A hint of what might be going wrong is provided by a qualitative study, which examined transcripts of consultations between pharmacists and older patients in a trial of pharmacist-led pharmaceutical care for heart failure⁹.

Extemporaneous preparation and small-scale manufacture of medicines

Pharmacists everywhere continue to prepare medicines in the pharmacy. This enables them to adapt the formulation of a medicine to the needs of an individual patient. New developments in drugs and delivery systems may well extend the need for individually adapted medicines and thus increase the pharmacist's need to continue with pharmacy formulation. In some countries, developed and developing, pharmacists engage in the small-scale manufacture of medicines, which must accord with good manufacturing and distribution practice guidelines.

Traditional and alternative medicines

In some countries, pharmacists supply traditional medicines and dispense homeopathic prescriptions.

Responding to symptoms of minor ailments

The pharmacist receives requests from members of the public for advice on a variety of symptoms and, when indicated, refers the inquiries to a medical practitioner. If the symptoms relate to a self-limiting minor ailment, the pharmacist can supply a non-prescription medicine, with advice to consult a medical practitioner if the symptoms persist for more than a few days. Alternatively, the pharmacist may give advice without supplying medicine.

Informing health care professionals and the public

The pharmacist can compile and maintain information on all medicines, and particularly on newly introduced medicines, provide this information as necessary to other health care professionals and to patients, and use it in promoting the rational use of drugs, by providing advice and explanations to physicians and to members of the public.

Health promotion

The pharmacist can take part in health promotion campaigns, locally and nationally, on a wide range of health-related topics, and particularly on drug-related topics (e.g., rational use of drugs, alcohol abuse, tobacco use, discouragement of drug use during pregnancy, organic solvent abuse, poison prevention) or topics concerned with other health problems (diarrhoeal diseases, tuberculosis, leprosy, HIV-infection/AIDS) and family planning. They may also take part in the education of local community groups in health promotion, and in campaigns on disease prevention, such as the Expanded Programme on Immunization, and malaria and blindness programmes.

Domiciliary services

In a number of countries, the pharmacist provides an advisory as well as a supply service to residential homes for the elderly, and other long-term patients. In some countries, policies are being developed under which pharmacists will visit certain categories of housebound patients to provide the counseling service that the patients would have received had they been able to visit the pharmacy.

The Role of Nurses in Providing Healthcare Services

In today's healthcare system, information technology is the foundation for the future. Healthcare modernization is best visualized if we compare how we were thirty years ago and where we are today. The need for improvement was the driving force behind the evolution of computers in healthcare. The majority of the past thirty years of technological expansion was spent on computer programs for administrative purposes while the past decade has seen an emphasis on the clinical process. Patient care has become a primary focus in the development of new concepts and knowledge in healthcare technology. Technological development in clinical applications is the current trend in healthcare and it will continue to play a major role for years to come. This article will describe the participation of nurse informatics specialists in adopting the right balance between the electronic documentation in nursing workflow and quality of patient care. HealthCare information technology began with the computer in the early 1970s and did not see a broad acceptance until individual computers were made available at the end of the decade. In spite of the advancement of the computer, actual clinical patient care was never a consideration until well after the turn of the 21st century. Crossover from administration to clinical applications started with individual departments that needed to speed up the process in order to provide better outcomes. Some of the automated systems began with radiology, pharmacy, and laboratory. This beginning then began to be adopted in other clinical departments. Information technology is quickly changing in all areas worldwide, creating new challenges and opportunities for different industries every day, including healthcare¹⁰.

The Registered Nurse's (RN) unique role on the health care team is the ongoing assessment of the patient's health status and the patient's response to their plan of care. For example, in the hospital setting the registered nurse is often the healthcare professional who spends the most time directly with the patient, providing the clock observations and care. The registered nurse is responsible for implementing the physician's orders, such as giving medications or changing dressings and assessing the client's responses to the treatment plan. The nurse is also responsible for evaluating the safety the medical plan of care before implementing it. Nurses critically interpret patient information and assessment data to make decisions about what actions are needed. The nurse focuses on helping patients meet their needs, including physical, emotional, cognitive, social, and spiritual needs¹¹.

The healthcare industry recognizing the need for communication between information technology personnel and healthcare practitioners in order to address the issues of patient care created nurse informatics specialist positions. Nurse informatics specialists are an integral part of the healthcare delivery process and a deciding factor in the selection, implementation and evaluation of healthcare, which supports safe, high quality and patient-centered care. This includes working with the healthcare team to develop and implement the best-individualized, evidenced-based plan of care for the patient. Nurses are patient advocates and facilitate optimal health, functioning, and wellness in the care of individuals, families, communities, and populations. Another important component of nursing care is patient education and coaching. Nurses work with patients and the healthcare team to assist patients in learning how to manage their own health. This includes addressing such topics as healthy lifestyle choices, coping with a diagnosis, or understanding warning signs and symptoms of emerging problems. The American Nurses Association (2008) defined Nursing informatics as "A specialty that integrates nursing science and computer science to manage and communicate data, information, and knowledge in nursing practice. Nursing informatics can also be defined as any use of information technology by nurses for the purpose of enhanced patient outcomes, the management of healthcare facilities, nurse education and nursing research. Many Advanced Practice Nurses have collaborative practices with physicians. Advanced Practice Nurses include Nurse Practitioners, Clinical Nurse Specialists, Nurse Midwives and Nurse Anesthetists. Some advanced practice nursing activities overlap with physicians since Advanced Practice Nurses can perform select medical therapies (e.g., prescribe medication). However, Advanced Practice Nurses also continue to use their nursing knowledge with a unique focus on addressing symptoms (such as fatigue, discomfort, itching) and functional problems (such as difficulty swallowing, skin breakdown, decreased mobility).¹²

Many healthcare individuals associate the field of nurse informatics as having two types of roles, the clinician who uses the health information technology and the specialist, who creates, facilitates, tests, and implements new information technology. Healthcare settings now integrate electronic medication prescribing, telehealth, online appointment scheduling and mobile laboratories where informatics nurses are essential in guaranteeing that the computerized solutions interface with each other. In order to accomplish information related activities, informatics nurses must synchronize and exchange significant clinical and technical information with the goal of supporting and coordinating safe, effective patient care

and assuring an efficient workflow. The role of nurses has included clinical nursing practices, consultation, follow-up treatment, patient education and illness prevention. This has improved the availability of health-care services, reduced symptoms of chronic diseases, increased cost-effectiveness and enhanced customers' experiences of health-care services. A vital element of healthcare information is nursing documentation. Information systems are designed for nurses where documentation can be best utilized to expand their knowledge of the quality of care. The evolution of knowledge has been exponential in the past forty years due to the new ways of learning that have been discovered. Nursing, in particular, has benefitted from these new concepts and continues to find newer and better methods to improve patient care. Nurses bring to their practice a personal history that develops the way their nursing care is performed. Nursing theory, standards of practice, legal and ethical obligations must be understood and utilized to enhance the quality of nursing care¹³.

The electronic patient record has become an important aspect of the information workflow, and using information technology will result in improving patient outcome quality and efficiency. Patient documentation is a vital skill in communicating the patient's condition and organizing their care according to the patient's needs. Nursing practice is primarily guided by patients' needs and depending on those needs and their environments, different theories can be applied to individualized care. The application of individual nursing practice is based on a combination of medical, philosophical, psychological and other nursing theories. Barbara Carper, a professor at the College of Nursing at Texas Woman's University, wrote an essay in 1978 titled the "Fundamental Patterns of Knowing in Nursing," that has identified four ways of knowing that nurses apply to meet patients' needs. Today many universities and nursing colleges are using her fundamental patterns to help nursing students gain a universal approach to assessing, understanding and treating patients. One of Carper's patterns is the empirical knowledge that is based on the result of the most relevant and supporting evidence derived from research. This includes research related to nursing informatics and the use of technology in healthcare¹⁴.

Before the digital age, nurses were utilizing paper forms to document important patient information. A significant factor in the nursing profession and healthcare systems is the transition to electronic documentation. Electronic documentation contains flow sheets that help in assembling information about the patient's needs, improve the patient's information accuracy, and enhance the quality of patient care. A well-designed information system can

facilitate and provide an easier and faster information flow that is needed for efficient documentation processing. Nurses play an essential role in patient's safety where the quality of the nursing environment and electronic documentation has a positive influence on patients. The electronic documentation method has evolved to provide a plan of care for patients, efficient communication between clinicians, and direct patient care processes. Nurses are very diligent in coordinating, monitoring and delivering patient care to guarantee effective documentation flow. Nursing computer-based software allows nurses to collect, store, recover data and integrate clinical data with nursing management resources. Among multiple healthcare organizations, nurses represent the largest technology user group. In the beginning, nurses believed that electronic documentation and information systems were an interruption to their daily workflow and a disruption from bedside care. Over the years however, nurses have become more accustomed to the technology, which is positive since their acceptance of it is imperative to successful system implementation. Today, nurses are more proficient in all aspects of information technology while maintaining superior levels of patient care. Most nurses now have a positive attitude related to the improved quality of electronic documentation and a new appreciation of the decreased workload afforded when using a well- designed system. However, despite the benefits of electronic documentation for nursing workflow, there are barriers that can obstruct the utilization of computerized documentation systems. Some of these barriers can result from behavioral issues in regards to perception and satisfaction toward information technology and the time spent documenting the patient information. The challenge comes when some nurses (i.e. older nurses) have doubts about working in a nursing environment filled with technology. Even though they are provided with reference guides, screenshots, and cheat sheets that are helpful, some nurses still have a hard time adjusting to electronic charting. Some of them have a fear of clicking in the wrong place as they work with computerized charts and they become aggravated when they cannot perform their electronic tasks. With electronic charting, nurses have the capability of accessing information quickly and efficiently and are able to use information to improve the quality of nursing workflow. In most of these situations, nurse informatics specialists play a pivotal role in assisting nurses in identifying and addressing these challenges. Many nursing theories have been developed to promote nursing practice efficiency. For an informatics nurse, change theory is the most integrated theory in their practice. Nurse informatics specialists apply theories in directing patient care while providing guidance and technical assistance for staff nurse workflow as well as providing leadership for system change¹⁵.

The informatics nurse is part of the delivery of care, the building of knowledge, skills, and the experience in the use of information technology. They often lead clinical informatics committee meetings that have a major influence for nurses in assisting them to coordinate all the multifaceted technology activities in regards to patient care, documentation and safety. Informatics committees provide continuing guidance in the development and implementation of information technology and digital solutions for nursing practice and patient care. The significance of developing and maintaining positive attitudes and computer-use acceptance among nursing staff have been discovered in multiple literature reviews. For a successful implementation of an electronic documentation system, it is important to understand the various levels of computer familiarity and acknowledge nurses' computer use needs, attitudes, skills, beliefs and readiness to learn. An informatics committee also provides structure, support and staff development to nurses from different departments who interface with or are impacted by information technology. Informatics and nurses support for ongoing professional development that implements the work knowledge of nurses leads to high quality care and patient satisfaction. Research reveals the importance of nurse's involvement in informatics committee meetings where they can participate in system design, redesigning workflow, and improving interdisciplinary communication. Many nurses are professionally and ethically motivated to contribute to new knowledge, high-quality improvement, and innovation through evidence-based decision-making. It has been observed that patient education has slowly become a major concern and that hospitals want to get involved in implementing better education for patients and their families. The importance of patient education is an example of critical study and evidence-based practice by nurses that has shown that knowledge, on the part of patients and their families, can reduce re-admission rates, decrease healing time, improve mental discomfort, and produce better patient results. Today, patients are educated with the help of technology including modern televisions, I-pads and other sophisticated electronic devices where the patient can watch, learn and explore their illnesses and care. Partnership with team members and families is essential to optimal treatment. The application of individual nursing practice is based on an arrangement of the clinician and the patient. Traditional patient education relied on written material about disease processes, medication, medical management, and self-care instruction guidelines. Today, patients benefit from many forms of education and with all these forms of education nurses can provide patients with knowledge that enables them to understand the disease process and make important decisions about their health. Nursing interventions in proper patient education improve patient self-care, satisfaction, moral support, coping skills and mental

stability. Addressing improvement in nursing workflow is essential to the improvement of patient stability and safety¹⁶.

The Role of Physician in Providing Healthcare Services -

A physician's unique role focuses on performing a history and physical to determine a differential diagnosis for the patient, including most likely diagnosis, and then developing management and treatment plans for those conditions/diseases. The role of the physician on a healthcare team is multi-faceted. The physician's responsibilities are based on regulated scopes of practice. The physician is trained to provide leadership in developing and supervising the patient's overall health care plan.

A physician's role can be divided into 5 general areas:

1. The physician takes medical histories and performs a physical examination to assess the patient to determine a possible diagnosis of both acute and chronic conditions. Diagnosis is a key feature of a physician's expertise in medical practice and is based on strong assessment skills. Diagnosis is a core cognitive skill, based on both knowledge and judgment.
2. The physician provides continuous care for the patient while in the hospital or ambulatory setting. They manage and treat a variety of medical conditions from minor cuts to mental health to palliative care to surgery. They are required to manage complexity and risk in situations that often times are uncertain and changing.
3. The physician works collaboratively with the healthcare team to provide optimal care. This includes providing referrals to other practitioners or services that the patient may need. They provide reports and updates on patient's condition and needs to other services such as physical therapy, home health services, and other specialists
4. The physician provides education to patients, families and support staff as it relates to the patient condition, diagnosis, and treatment. The physician will offer resources with information and research that patients can use to make informed decisions about their treatment plan. The physician will often teach medical students, residents, physician's assistants, advanced practice nurses, and others about their area of expertise as well.
5. The physician plays a very important role as an advocate for patients and families. They help the patient navigate through a complex medical system to be able to obtain the most

patient-centered care in a cost-effective manner. The physician works to identify and meet the needs of the individual patient, the practice population, and the community by working with a variety of partners in the community, public health sector, and hospital system.

Medicine is a helping profession, the primary purpose of which is to serve the needs of patients. Doctors advise, if possible cure, and certainly succor those who look to them for help. They skillfully use science and technology to reverse what can be reversed in a structural or metabolic defect, and preserve or restore a patient's function to the extent possible¹⁷.

One of the central functions of the physician in practice, whether acting as a member of a team or as an individual, is to make an accurate diagnosis by identifying the problem that the patient presents as it affects that particular patient, and to work out a relevant plan of action for that patient.* Physicians decide which diagnostic tests to order, whether or not a patient should be hospitalized, what therapies to employ, which drugs to prescribe if any; they also perform surgery or other procedures, and decide when to hospitalize and discharge patients. In certain contexts, for example, in the care of the developmentally disabled child, physicians function as members of teams. However, more often the physician alone must make sound, individual, clinical decisions. Historically, the relationship between physician and patient has been a special one, with the trust of the receiver of care placed in the provider and in the institutions with which the provider is affiliated. This traditional trust is being questioned as a result of societal changes such as the rise of the consumer movement; the changing status of various sectors of the population, particularly women; and some increase in public skepticism about the role and relevance of science and technology as the keys to social welfare and societal progress. Third-party payers' willingness to reimburse for second opinions and publicity about physician abuses in the Medicare and Medicaid systems also raises public doubts about the reliability and credibility of individual physicians. Consumer groups, clients, and others now seek to participate in decision making in areas that in the past were left entirely to physicians. A primary physician function is to make the patient feel better; for the physician to do so effectively, a certain amount of authoritarianism, paternalism, and domination may be necessary. If physicians do make patients feel better most of the time, then it is chiefly because the physician can reassure the patient or give medication that is palliative. Thus if physicians are to be effective in alleviating the patients' complaints by intangible means, it follows that the patients must have confidence in the physicians

themselves and in their advice, reassurance, and selection of treatment, even though the basic disorder may not be curable. The patient's conviction must be based on the belief not only that the physician can be trusted, but also that the physician has some special knowledge that the patient does not have. The successful doctor-patient relationship requires the patient's trust, and acceptance of some domination. The physician must take the responsibility for the treatment of the patient, and not shift it onto the shoulders of the patient, although this does not, in some cases, preclude the physician's frankly admitting that he or she does not have all the answers. Nor does it preclude informed consent and responsible decision making by the patient.¹⁷

In a recent study of 1,000 families, it was found that 64 percent were dissatisfied with their doctor-patient relationship and that 48 percent of upper-income families and 37 percent of lower-income families had changed physicians because of dissatisfaction with the physician's personal qualities. Thus the doctor-patient relationship appears to be suffering despite our steadily advancing medical knowledge and constant improvement in therapeutic tools. Reasons for dissatisfaction include the physician's lack of warmth and friendliness, failure to consider a patient's concerns and expectations, use of unfamiliar terms, and lack of adequate explanations concerning the diagnosis and cause of illness. The physician's success in meeting the patient's needs will depend, at least in part, on the success of medical educators in teaching essential psychosocial skills, and in part on the personal qualities of the individual. To repair and improve the doctor-patient relationship, physicians need to understand the impact of their personal behavior on patients. Doctor-patient rapport is the most universally applicable therapeutic tool and must be used judiciously. A more workable model than the relationship of omnipotent doctor and the completely dependent patient is the relationship of mutual participation and cooperation in which responsibility is shared by doctor and patient. To facilitate the development of physicians who can apply a biopsychosocial approach within a relationship of mutual participation between doctor and patient, medical school admissions policies need to consider the characteristics that would make the students amenable to this approach. The present difficulties in the doctor-patient relationship will require increased training in communication, open dialogue with public participation, and realignment of medical school admissions policies.¹⁸⁻²⁰

About 10 percent of physicians remain in academic medicine and spend a major portion of their time in research, ranging from basic biomedical to clinical research. Research

physicians should have most of the personal qualities necessary in practice—integrity, decisiveness, insight, and intellect are all crucial. Less important for research without practice are empathy, tolerance of ambiguity, community orientation, and a sense of social responsibility. The more those patients are involved in the research, the more the qualities of the researcher must be similar to those of the practitioner. The educational function of physicians is quite different from the research function. All physicians are educators by the very nature of their work. One of the major functions of the physician in the doctor-patient relationship is to impart information in a useful fashion that is, to educate. Academic physicians also teach, in the hospital, at the bedside, and in the classroom when training medical students, interns, and residents. The problem of how to teach physicians to be good educators needs to be explored, since most of their skills as educators are self-taught, with varying degrees of success. Although only few physicians become full-time administrators, most must perform at least some administrative functions, either in running of their private practices or in more formal functions within a practice, a hospital, or a medical school setting. Finally, all physicians are influential citizens because of their level of education and their status in society.

Healthcare technology assessment-

Healthcare technology assessment (HTA) is the multidisciplinary evaluation of medical technologies with regard to efficacy, safety, feasibility, cost, cost-effectiveness and indications for use²¹. Complete HTA should explore the scientific, ethical, economic and social reasons for adopting a new technology and how such technologies will influence the quality of service and the distribution of resources. A common example of a new technology where physicians are extending indications for the use of a new device is the reverse total shoulder prosthesis. Indications for the use of the reverse-shoulder prosthesis are glenohumeral arthritis with an irreparable rotator cuff, irreparable rotator tear or with glenohumeral instability, or a failed arthroplasty with rotator cuff deficiency. The device has proved to be successful as salvage for these specific problems; therefore, it is widely used in these limited situations without the benefit of a prospective clinical trial. However, some surgeons are enthusiastically using this implant for osteoarthritis of the shoulder with an intact rotator cuff. This is an abuse of the procedure, i.e., being used for a situation for which it was not designed nor needed. There are other implants available. Of course, this new device is more expensive than other previous implants on the market. Maybe in the future,

the reverse shoulder will be proven the best implant for shoulder replacement. However, because of the risks of a new technology and the increased cost of the new technology, clinical trials are needed to prove the implant's safety, efficacy and long-term success before expanding its original intended use. One of the factors that promote the overutilization of new, expensive, and heavily promoted new technologies.

Many emerging healthcare technologies will dramatically affect both the cost of healthcare delivery and the health and welfare of society. In a near-term i.e., 0–1 year, artificial discs, as well as ultra-high field strength MRI and cardiac CT angiography are examples. In the mid-term between 1 and 4 years, permanent artificial hearts, robotic neurosurgery, cancer vaccines and focused ultrasound for lesion ablation are examples. For the longer term, i.e., more than 5 years, proton beam radiation, islet cell transplantation for diabetes, gene therapy for revascularization, and other diseases are examples. Importantly, it is necessary in each of these examples to assess the benefits, risks and costs before the new technology is available for general use by physicians. Implementation of such a comprehensive approach as described allows physicians to identify problems or opportunities that need technological solutions, such as the wear debris after total hip arthroplasty. We must examine the use and effectiveness of technologies, for example, the Spine Patient Outcomes Research Trial, in order to be involved in evaluating and establishing policies, participating in the assessment of technology regulation and reimbursement, and finally to continue to scientifically contribute to medical and societal discussion of new healthcare technologies.²²

SUMMARY

From the above literature we conclude that along with traditional healthcare system if we (Physician, Pharmacist, and Nurses) utilize more advanced healthcare system that will give more accuracy, quick results, probability of errors are very less. For the rapidly growing population, traditional healthcare system is less sufficient to support their health-related issue. Many emerging healthcare technologies will dramatically affect both the cost of healthcare delivery and the health and welfare of society. HealthCare outcomes including quality of life measures are the result of a multifaceted relationship between the patient, the nurse, the treatment and the information healthcare system. A strong foundation for addressing the challenges of electronic documentation is the informatics nurse's capability to understand and direct the balance of patient care with the technology systems and organizational structure that supports this balance. In order to guarantee a successful implementation of a computer

system while managing patient care, it is important to integrate nurses' perceptions, beliefs, and knowledge in the use of new technology and how nurses implement this technology into their daily nursing practice. Finding the right balance of information science in conjunction with nursing science is a continuing process that will rely on the forward thinking and perseverance of today's modern nurse and the support of nursing informatics specialists. Improving quality of life is one of the main benefits of integrating innovations into medicine. Medical technologies like minimally invasive surgeries, better monitoring systems, and more comfortable scanning equipment are allowing patients to spend less time in recovery and more time enjoying a healthy life. The integration of medical equipment technology and telehealth has also created robotic surgeries, where in some cases; physicians do not even need to be in the operating room with a patient when the surgery is performed.

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