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EDITORIAL

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Information and Communication Technology (ICT) for health encompasses tools that facilitate communication, processing and transmission of information by electronic means for the purpose of improving health.[1,2] It is a powerful tool and plays an important role in improving health related access and quality of services for the community. Recent advances have resulted in emergence of innovative ideas in health care services with better quality of care for the patients. These novel changes range from advancement in diagnostic and therapeutic procedures to telemedicine and includes patient's education through provision of information regarding disease management, self-care and adherence to treatment plan.

Technological advances have introduced new procedures and methods for diagnosis and treatment. Interventions in infection control, minor surgical techniques, advances in reproductive technology, and gene therapy for cancer treatment, have increased the longevity and improved the quality of life of many patients.

Access to the internet has grown rapidly throughout the world including Pakistan. Its powerful infiltration into the health sector has led to empowerment of patients, helped in exchange of information among health professionals and hence produced new effective strategies and health care models. At present, more than 1.4 billion people are using the internet worldwide,[3] whereas, Pakistan has only 3.5 million (2.12%) of internet users.[4]

Currently, internet is used by health workers to get access to the latest information in their field, consult their colleagues, and communicate with patients and among patients for accessing medical information, and sharing of their experiences.[5]

Apart from all these benefits, there is a strong concern regarding the unchecked information that may mislead, or be inaccurate, or inappropriate, and hence places consumers at unnecessary risk. This issue requires law enforcement with detection of violations and subsequent punishments.

There are emergence of various databases that store the health information of patients in the form of storage devices for patients and health professional's use. Personal Health Records (PHRs) are initiated and maintained by patients and contains information related to patients health including past medical, surgical history, drug information, information for vaccinations, laboratory test results etc. in a usable and portable computer device.[6]

Electronic Medical Records (EMRs) stores the health information of patients such as drug allergies, diagnoses, treatments, laboratories results and medical history etc.[7] These records are primarily used by health care providers and are stored within a given institution or organization such as hospital or health delivery system. These records allow health care providers to identify and recommend patient-specific services, generate reminders to increase patient compliance with physician's recommendations, and communicate and co-ordinate with other specialists treating the same patient. Electronic Health Records (EHRs) are similar to EMRs, but can be shared among different institutions to link data from various providers to give a more widespread view of any single patient's health record and to facilitate interactions within the entire health system.[8]

Computerized Physician Order Entry (CPOE)[9] and E-Prescribing[10] are processes involving electronic entry of physician's orders into the computer for the treatment of patients (particularly hospitalized patients) under his or her care. These instructions are communicated through computer network to concerned medical staff and departments (laboratory, pharmacy or radiology).[11] Many of the private and government hospitals are using these record system for treatment and data storage in Pakistan while many others are adopting it. This helps them in reducing medical errors related to prescription writing, decreases delay in order completion, taking care of patient safety by giving warnings related to patient's conditions and side effects of drugs, shortens stay of patients and decreases cost.

Telemedicine has become widely common in the field of medicine during the last decade. The word '*Tele*' means "at a distance" and encompasses the use of medical information exchanged from one site to another via

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electronic communications for the health and education of the patient or health care provider for the purpose of improving patient care.[12] It is composed of different communication modalities including video conferencing, other conferencing modalities, Web-based communication systems, and telephone services.

Pakistan has a poor infrastructure with inadequate number of doctors in comparison to patients. Pakistan has one physician for 1310 people, a dentist for every 25297 people, and a nurse for 4636 people.[13] This situations has resulted in an increase in maternal and infant mortality rate[14], further ensuring the need of revamping of poor infrastructure of health through utilization of information technology.

Telemedicine was first introduced in Pakistan in 1998 in Northern areas of Pakistan, Gilgit and Taxilla and used internet and video conferencing to provide specialist care to the remote areas of the country, especially to vulnerable group.[15,16] This innovative technology was also utilized for disaster management during earth quake in 2005 for treatment and management of injured patients and their rehabilitation.[17] Telemedicine has also been used to educate doctors and health care professionals through conferences and workshops.[18-20] This provide better chance for the physicians to learn new and latest technology, stay updated with recent knowledge and grow professionally with more job opportunities worldwide.

Despite of rapid expansion of information technology into daily life and business, the healthcare industry in Pakistan has been slow to adopt this new tool. There are many obstacles which need to be broken such as vulnerability of patient's privacy and confidentiality, high cost for initial implementation of electronic health systems, requirement of qualified personnel for handling, maintenance, and upgrading of this technology. Resistance from physicians is another barrier for implementing ICT into medical practice. Many health care providers lack motivation or expertise and are reluctant to learn new technologies, especially the old doctors who work at the rural and geographically isolated regions. Poor health infrastructure also contributes to hampering of information technology. Majority of government hospitals still lack internet, computers and audio visual aids facilities, therefore, webinar, video conferencing are not possible and still require upgrading of services.

The growth of new health information technologies point towards delivering better health care and encouraging pro-active health strategies in order to improve patient safety, efficiency and data collection with minimum cost. Information technology alone, however, cannot change systemic problems related to health, such as poverty, lack of access to health care, skilled staff, insufficient technology and support from the government.

There is a strong need for strategies which can incorporate ICT into medical practice and effectively minimize and remove barriers adversely impacting its usage. Opportunities should be provided for physicians' training for use of technology through workshops. Major support is required from the government for allocating more funds for health care industry and improvement of basic infrastructure of health care and thus resulting in a healthier future for our nation.

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