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Editorial

Medical Informatics in Iran and the Emergence of Clinical Informatics

Medical Informatics, an emerging multidisciplinary field at the intersection of medicine, technology, and information sciences, is believed to significantly impact health and medical practice.[1] Nowadays, it is not strange to see new approaches for producing, measuring, and monitoring digital biomarkers using implantable sensors, wearable devices, and mobile health apps on intelligent platforms and knowledge-based systems. Tapping an app icon on a smartphone might save a human life. Mobile health apps can assist patients in managing their medical and health issues, especially in the case of chronic diseases. Mobile apps can also facilitate clinical diagnosis, treatment, and even medical procedures for health professionals. Clinical Informatics, a newly added subspecialty program after medical specialties, seems to improve the current and future of clinical practice.[2, 3] A broader field, known as Health Informatics, is a connected set of disciplines and branches from medicine, computer sciences, and humanities. Similar to medical/clinical informatics, the overarching field of health informatics aims to improve access to, enhance quality and safety, and reduce the cost of health services.

Medical informatics has been practiced in western countries for more than half a century. In terms of application, this discipline emerged in the middle of the 20th century with the initial use of computers in medical sciences. In the 1960s, the first intelligent medical diagnostic programs were developed, and in the 1970s, the first electronic hospital was opened. In parallel, the academic field of medical informatics was also established in the 1970s (in Europe and the United States). Over 200 institutes worldwide provide undergraduate and postgraduate programs in this field.[4]

In Iran, the first steps of the academic training of medical informatics were taken in late 1990s, when the first group of scholars in this field received scholarships to study at leading universities overseas. Upon return to the country, they contributed to the development of the medical informatics curriculum with the collaboration of scholars in related areas such as health information management and healthcare management at the master and PhD levels. The first official master and PhD programs in medical informatics in Iran commenced in 2008 and 2009, respectively. Currently, the four-year PhD program in medical informatics is offered at Urmia, Iran, Tehran, Shahid Beheshti, Mashhad, and Kerman Universities of Medical Sciences with an estimated annual capacity of 15 students, and the two-year master's degree at ten universities with a total annual capacity of 40 students. Collectively, there are approximately 350 graduates at these two levels.

Applications in the field of health informatics can generally be divided into two groups: those that handle administrative data for health and medical processes, and those that manage and make meaningful use of clinical data. Each of these two general models has a distinct value for the healthcare system.

In the first category, various information systems are used to manage and support service activities in the health systems in Iran. For instance, the comprehensive information management system of clinics and medical centers, with countrywide access within health centers; the occupational medicine management system, the eligibility assessment system of health insurance services in Iran; medical insurance electronic prescription systems; various types of hospital information systems; and dozens of other platforms with a large number of web-based and mobile-based systems in the private sector. During the previous decade, these have been gradually integrated, relying on the infrastructure of the national organization for civil registration, social security organization, and police security check database.

The second category is concerned with the use of clinical data to make decisions about patients and their treatment. It is referred to as Clinical Informatics and is currently being taught and developed as a medical specialty worldwide. In Iran, the first official round of Clinical Informatics courses started in 2021 at Kerman University of Medical Sciences.[5] The courses have been successfully completed by about 122 medical students, 34 specialty residents, and 312 specialists and sub-specialists across the country.

In recent years, numerous research projects on medical informatics and the optimal use of information technology in healthcare have been conducted in Iran. Several systems, including clinical decision support systems, Persian mobile health apps for smartphones, health services websites for the public, online appointment systems for private medical offices and clinics, as well as the use of artificial

intelligence in medicine, the use of electronic dispensing system in pharmacy, the prediction of kidney transplant patient survival, to name a few, have been developed as a result of these research projects.

The strategic projects of the Ministry of Health and Medical Education of Iran have also led to the design and implementation of national systems such as the Iranian National Electronic Health Record for Every Citizen (named SEPAS) and the National Integrated Health Record System (called SIB).[6, 7]

It is necessary for the high-level management affairs of the health sector in Iran to more effectively support the development of medical informatics knowledge, especially in terms of skill training. On the other hand, specialists in this emerging field should focus on real problems and seek out more sophisticated and practical technical solutions to improve healthcare and medical services in Iran and the region. Moreover, public-private partnerships can facilitate remarkable projects that are in line with the strategic plans for the health system, paving the path for national collaboration of all stakeholders.

Conflict of Interest: None declared.

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