مقاومت سلامت، ۲۰۲۰؛ قطعه عطوفی برای تحقیق سلامت هوشمند
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نامه به سردبیر

درفیت مقاله: ۱۴۰۰/۲/۱۴
پذیرش مقاله: ۱۴۰۰/۱/۳۰

تاریخ انتشار: ۱۳۹۹/۱۲/۲۰

چاپ در حوزه مهندسی پزشکی

امیدوارم این مقاله به مردم منطقه‌ای من نیازمندی باشد.

کنجه، پژوهشگر، درمانگاه سلامت فارابی، اصفهان

مجله مدیریت اطلاعات سلامت
DOI: 10.48305/him.2024.42520.1175

http://him.mui.ac.ir
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Healthcare 4.0: A Turning Point for Smart Health
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Building on the first four industrial revolutions, Industry 5.0 is the recent development in the manufacturing and industrial sector (1). This idea emphasizes the importance of human skills in production processes. While in the late 18th century, mechanization and steam power gave rise to Industry 1.0 while assembly lines and mass production arisen from Industry 2.0 in the early 20th century by. Industry 3.0 introduced the use of computers and automation in the 1970s and Industry 4.0 saw the emergence of the Industrial Internet of Things (IIoT) and Artificial Intelligence with the widespread adoption of data and connectivity in the manufacturing sector. Because the First Industrial Revolution, advances in manufacturing have made production processes more complex, automated, and sustainable, allowing machines to operate effectively and consistently (2).

Healthcare 4.0 serves as a technological catalyst to accelerate growth through the integration of industrial technologies. Healthcare 4.0 includes several key components, including Artificial Intelligence, data analytics, Internet of Medical Things (IoMT), telehealth, and blockchain technology (3). Healthcare 4.0 represents a turning point in the evolution of healthcare, promises better prevention and prediction, personalized care delivery, patient safety improvement, information security improvement, better remote patient monitoring and care, and greater operational efficiency and affordability, which of course requires collaboration, investment and coordinated effort to deal with possible challenges. Some organizations, such as the Cleveland Clinic and Schón Clinic in Germany, have made significant changes in this regard (4).

By investigating the progress from Healthcare 1.0, which is the encounter of patient with a physician, to Healthcare 4.0, which includes the use of many different connected technologies along the use of massive data, it has been revealed that the healthcare has been changed from the simple medication to more complex and intelligent treatment of disease, and in a way, smart health is here. Smart health is a term inherently integrating ideas from ubiquitous computing and ambient intelligence applied to the concept of P4 medicine including preventive, predictive, personalized and collaborative; therefore, it is tightly connected to concepts of wellness and wellbeing (5). Using big data collected by a large number of sensors and equipment as well as stimuli for monitoring, smart health predicts and improves the physical and mental conditions of patients (6). The smart health endeavors to provide personalized, patient-centered and evidence-based care which is achieved by using artificial intelligence along with smart technologies and equipment and placing the patient at the center of designing care services (7).

However, to achieve smart health as the important result of using artificial intelligence in the field of health, it is necessary for the stakeholders and policymakers to get involved, novel technologies and experts need to get involved, the infrastructures both hardware and software should be provided while they are all connected, and at the end, individuals including patients, care providers, and health workers should be at the center of it.

In Iran, as a developing country, in order to achieve smart health, which is known as a major use for artificial intelligence in health domain, it seems necessary to first carefully investigate the current situation, the quality and quantity of existing data should be improved, stakeholders, policymakers and statesmen should actively participate and take serious action to determine and ensure enforcement of rules, laws and policies as well as monitor functionalities, technologies. Moreover, experts from different fields should be used, the infrastructures of both hardware and software should be provided while they are all connected, and at the end, individuals including patients, care providers and health workers should be at the center of it.