

Trends in Telemedicine and E-Health: The Future of Healthcare

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***Corresponding author:** Abdullah Abdulaziz AlWabel, Endocrinology, Diabetes and obesity Consultant, University Diabetes Center, King Saud University Medical City, Seha Virtual hospital CMO, Riyadh, Saudi Arabia

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Abdullah Abdulaziz AlWabel* and Anusha Sultan

Endocrinology, Diabetes and obesity Consultant, University Diabetes Center, King Saud University Medical City, Saudi Arabia

Opinion

The 21st century, also known as the era of innovation, has witnessed the most rapid and complex technological advancements in all sectors and walks of life. After years of efforts by scientists, researchers and clinicians the healthcare industry has witnessed remarkable digital transformations in the form telemedicine, which is defined as “the use of telecommunications to provide and support healthcare remotely” [1]. Telemedicine is a branch of e-health, which refers to the use of electronic means to provide and improve healthcare delivery, via digital records, mobile applications and health information system [2]. While the concept of digital health seems relatively new, the first recorded incidence of telehealth surprisingly dates to one of the first telephone calls made by Alexander Graham Bell in 1876, where he sought advice for treatment of a skin burn from sulfuric acid over a phone call [3]. However, it is only recently that this movement gained momentum after the COVID-19 pandemic and its associated global quarantine.

During COVID-19’s global shutdown, the world witnessed a shift towards remote services in all sectors, from education, employment to healthcare [4]. This catastrophe while disastrous, set a trending paradigm globally, of how all activities could function remotely as well, including the delivery of healthcare, in rather a more patient centered approach and a cost-effective, comfortable and accessible manner. While all this technology and e-health seems greatly fascinating, it is essential to note, that its use and adoption is new and limited to only the developed countries across the globe such as the United States, United Kingdom and the Middle East [3,5]. Over the past decade, Saudi Arabia has been progressing rapidly in the development of its healthcare sector and is now home to many of the most technologically advanced hospitals and healthcare centres across the world. Seha Virtual Hospital (SVH) located in Riyadh, Saudi Arabia, is one of the largest telemedicine providers in the world and a pioneer setup of its kind. As a project of the Saudi Ministry of Health (MOH), SVH is connected to 130 hospitals across the country including remote setups and there by unites remote hospitals and populations to the leading consultants in the country and the most advanced healthcare technology, all through a single phone call. The hospital currently over healthcare delivery in more than 30 specialties such as tele-ICU, tele-stroke, tele- EEG besides several others.

Seha Virtual Hospital has revolutionized the once new concept of digital health in the country, the foundation of which was laid in 2000, by the Saudi government establishing a reform to launch e-health services within the country [6]. Latest research in the region has also showed a positive and more accepting attitude of medical staff and patients towards telemedicine services, especially after the COVID-19 pandemic [7]. This comes with a better understanding by the population of the benefits of e-health and telemedicine such as improved

accessibility to healthcare, an issue which has long lingered especially for populations residing in remote areas. E-health has made these remote visits cut down on commuting costs besides other complementary spending as has been seen globally [3]. What was once an appealing dream for patients to think they could have avoided long waiting queues for an appointment after a tiring commute to the hospital, has now been turned into reality at the comfort of a patient's home, through a video conference, all thanks to telemedicine.

The evolution from paper based to digital systems over the years has also proved to be a great, environmentally friendly and green approach in reducing paper waste. The transition to paper-less Health Information Systems (HIS) in hospitals and all healthcare sectors, where all patient registries are now stored confidentially online, is another appreciable aspect of e-health which has seen a rising trend in the recent years. This can be extended to the availability of all medical literature and publications online on research databases and scholarly websites for the use, citation and awareness by people from all walks of life. Integration of Artificial Intelligence in medicine has been a pivotal breakthrough in patient diagnosis, disease identification and treatment plans with the help of complex software. Robotic technology is also on the rise and this form of e-health has been seen to assist several hospitals within the Kingdom, including king khalid university hospital, Riyadh whereas nano technology is now being used to assist drug delivery. The use of remote patient monitoring technique is another aspect of telemedicine where smart devices such as wearable sensors monitor a patient's heart rate, glucose levels and blood pressure for a set period, data of which is live transmitted to the provider in real time for timely diagnosis. Health apps and mobile technology has allowed patients to access their own data, track their physical activity, sleep routine, diet plans, treatment schedules and be alerted by important notifications such as upcoming appointments or medication reminders through a single touch of their screen.

These remarkable innovations have greatly changed the access to all forms of healthcare such as emergency care, mental health services or routine checkups. However, with the growth of technology, it is essential that the benefits of e-health are felt and appreciated across the globe, by people of all colours, nationalities

and socio-economic classes without it being reserved exclusively for the privileged or the economically fortunate. The trend and future of digital health is bright yet, the literature on its impact is scarce. Active efforts must be put in by stakeholders to establish competency-based frameworks which not only allow telemedicine and e-health to broaden their horizons into low-income countries but that all healthcare providers are also educated about its safe and efficient use [8] that populations break preconceived notions about the use of technology and feel comfortable and safe by its utilization and that healthcare setups maximize the use of technology in the most productive way possible. These approaches can lead to a dynamic revolution in the healthcare field by ensuring the delivery of unprecedented levels of efficient, high quality and cost-effective healthcare.

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