The Future of Healthcare

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Introduction

The COVID-19 pandemic has changed the face of healthcare for at least the next generation [1]. In the next 20 years changes brought about by the severity of dealing with COVID-19 beginning with the after-effects to the population, the multiplier effect on complexity of disease conditions and the emotional stresses brought about by isolationism and taxing of the healthcare system has led to innovations. The future of healthcare is likely to be shaped by several emerging trends and technologies [2]. Here are some of the key developments that may shape the future of healthcare: Diagnosetics, Genomics and precision medicine, Artificial Intelligence and Robotics, Electroceuticals, Wearables/Sensors, Patient-Centered Care, Telemedicine, Nutritional Support/Functional Foods, and Beverages. Healthcare has changed dramatically because of technological developments, from anesthetics and antibiotics to magnetic resonance imaging scanners and radiotherapy [3]. The impact of the Internet of Things (IoT) on the advancement of the healthcare industry is immense [4]. As policymakers and business practitioners across the globe expend extraordinary effort toward the field of e-health, the thriving development of healthcare-wearable technology is creating great opportunities and posing a remarkable future for healthcare services [5].

Diagnostic

Changes affecting healthcare include.

a)   Social and economic changes in society (aging population, isolationism, and increased pathogen load).

b)   Changes in how health care is provided, and

c)   Advances in healthcare technology [6]. Medical Research has also become more related to observational data and meta-data analysis based to give similar answers to more invasive clinical and case studies with the same effectiveness [7].

Genomics and Precision Medicine

Advances in genomics are leading to more personalized treatments based on an individual's genetic makeup. Precision medicine considers a patient's genes, environment, and lifestyle to create personalized treatment plans [8].

Artificial Intelligence and Robotics

Lately, artificial intelligence (AI) has been receiving much undeserved press, most likely due to the fear that can be conjured up about such widely publicized platforms as ChatGPT®. But AI can be much more than ChatGPT. AI is simply "software used by computers to mimic aspects of human intelligence." Under the umbrella of AI are specialties like "machine learning" and "deep learning" that can make decisions without humans [9]. By using machine language to simulate the human process of thinking, learning, and looking up data, computers can be designed to answer questions by reading reems of information from a multitude of sensors then compare the results to a wide array of published database information to draw appropriate conclusions. Therefore, AI is now poised to play a significant role in healthcare in the coming years as it can help with diagnosis, drug discovery, and personalized medicine. It can also be used to analyze patient data and identify patterns that can help providers make better decisions [10]. Additionally, three- dimensional (3D) printing is a rapidly emerging manufacturing technology that has found its way into drug delivery and medical sectors [11]. 3D printing allows for creating special and hard to find equipment, even very complicated devices. Also, robotics technology is being used to assist with surgeries and other medical procedures. Robots can provide more precise and less invasive surgeries, which can lead to faster recovery times and better outcomes. Robotics can also be very efficient at homes and unload the pressure on home-assisted care. And now with the onset of precision technology, drones can be used for delivery and emergency access to remote or hard-to-reach places.

Treatment Technology

Electroceuticals

While it has been recognized for decades, if not centuries, that the human body has been made up of carbon-based building blocks

like proteins, carbohydrates, fats, enzymes, hormones, and water, it is now being recognized that the ionic charge on each atom that make up these building blocks may be even more important. Innovations such as Electrolyte, with its wide spectrum of properly charged essential minerals allow for pathogens to be eliminated, based on the electrical polarity, and destroyed, triggering natural immune responses that aid the patient in healing faster and having on-going immunity [8].

Wearables and Sensors

Since the media excitement that helped introduce the Fitbit® IPO to Wall Street, many individuals around the globe are now using these devices and similar wearables to monitor their daily step count; most of whom look to achieve 10,000 steps per day (a number introduced by Fitbit®). While this new motivation has certainly provided helpful awareness about one's need to increase their daily exercise activities, monitoring steps barely scratches the proverbial surface of what a wearable can provide the wearer. Wearable devices attached to smartphones or other proprietary devices, such as tablets are becoming increasingly popular, allowing patients and professionals alike to monitor health in real-time [12]. These devices can track and create clinical references for everything from heart rate and blood pressure to sleep patterns and physical activity [13]. The data from these devices also can become the basis for not only monitoring but also giving direction through algorithms for treatment [14].

Care

Patient Centered Care

Overall, the future of healthcare is likely to be characterized by greater patient-centered care, increased access to care through technology, and more personalized treatments based on an individual's unique needs [15]. Tech and Service Companies like Apple, Microsoft, Amazon, Samsung, Nokia, and others innovating on-screen, artificial intelligence, and database storage technology solutions towards efficiencies in person- based care [16]. Healthcare is undergoing a revolution with the availability of wearable sensors. Hospitals have exploited the development of the Internet of Things (IoT) sensors to create remote patient monitoring models that observe patients at their homes and in assisted living conditions [17]. With the long-term monitoring of patients this generates big data for which further diagnostic tools can be developed [18].

Telemedicine and Remote Monitoring

The COVID-19 pandemic has accelerated the adoption of telemedicine and remote monitoring technologies [19]. By combining these tools with the other innovations discussed herein, the remote monitoring technologies will allow healthcare providers to monitor and treat patients from a distance, increasing access to care and improving health outcomes. Unfortunately, it may also come with the inevitable cost of data access and privacy issues [20].

Nutritional support, Functional Foods, and Beverages

Foods and beverages with claimed health benefits based upon scientific research. Beverages can bring energy, much needed vitamins and minerals for health maintenance, and happiness [21]. Foods as nutrition is basic, but what are the elements of the diet can eventually lead to disease states. Balancing fats, protein, potential allergens, and beneficial foods which help immunity, mental functioning and growth are vital to health and longevity [22].

Moving Forward

Artificial intelligence (AI) in healthcare is becoming increasingly important, given its potential to generate and analyze healthcare data including genomics to improve patient care and reduce costs and clinical risk while enhancing administrative processes within organizations [23]. Using new tools such as Electroceuticals and functional foods which functionally target wellbeing has become a societal trend. Wearables will allow for more personalization and tracking along with metadata analysis for better planning and actions for successful health outcomes [24].

References

1. Ye J (2020) The role of health technology and informatics in a global public health emergency: practices and implications from the COVID-19 pandemic. JMIR Med Inform 8(7): e19866.

2. Eng TR (2004) Population health technologies: emerging innovations for the health of the public. Am J Prev Med 26(3): 237-242.

3. Thimbleby H (2013) Technology and the future of healthcare. J Public Health Res 2(3): e28.

4. YA Qadri, A Nauman, YB Zikria, AV Vasilakos, SW Kim (2020) The Future of Healthcare Internet of Things: A Survey of Emerging Technologies. IEEE Communications Surveys & Tutorials 22(2): 1121-1167.

5. Jing Wu, He Li, Sherri Cheng, Zhangxi Lin (2016) The promising future of healthcare services: When big data analytics meets wearable technology. Information & Management 53(8): 1020-1033.

6. Gossink R, Souquet J (2006) Advances and trends in healthcare technology. Advances in Health care Technology Care Shaping the Future of Medical. Pp. 1-14.

7. Ali MS, Lopes LC, Ramos D, Bispo N, Ichihara MY (2019) Propensity Score Methods in Health Technology Assessment: Principles, Extended Applications, and Recent Advances. Front Pharmacol 10: 973.

8. Shane A Phillips, Mohamed Ali, Charles Modrich, Shariwa Oke, Ahmed Elokda, et al. (2019) Advances in Health Technology Use and Implementation in the Era of Healthy Living: Implications for Precision Medicine 62(1): 44-49.

9. Vatandoost M, Litkouhi S (2019) The future of healthcare facilities: how technology and medical advances may shape hospitals of the future. Hospital Practices and Research 4(1): 1-11.

10. Leonard Sonnenschein, Tiberious Etyang, Rutu Shah, Ruth Frischer, Glen Rein (2021) The Effect of An Aqueous Electricidal Solution on General Well Being. Am J Biomed Sci 13(4).

11. Cheung ML, Chau KY, Lam MHS, Tse G, Ho KY et al. (2019) Examining consumers' adoption of wearable healthcare technology: The role of health attributes. Int J Environ Res Public Health 16(13): 2257.

12. Greiwe J, Nyenhuis SM (2020) Wearable technology and how this can be implemented into clinical practice. Curr Allergy Asthma Rep 20: 1-10.

13. Wu M, Luo J (2019) Wearable technology applications in healthcare: a literature review. Online J Nurs Inform 23(3).

14. Bridges JF, Jones C (2007) Patient-based health technology assessment: a vision of the future. Int J Technol Assess Health Care 23(1): 30-35.

15. Philip NY, Rodrigues JJ, Wang H, Fong SJ, Chen J (2021) Internet of Things for in-home health monitoring systems: Current advances, challenges and future directions. 39(2): 300-310.

16. Murkofsky RL, Alston K (2009) The past, present, and future of skilled home health agency care. Clin Geriatr Med 25(1): 1-17.

17. Hassan MK, El Desouky AI, Elghamrawy SM, Sarhan AM (2019) Big data challenges and opportunities in healthcare informatics and smart hospitals. Security in smart cities: Models, applications, and challenges. Pp. 3-26.

18. Foster CC, Agrawal RK, Davis MM (2019) Home health care for children with medical complexity: workforce gaps, policy, and future directions. Health aff 38(6): 987-993.

19. Birchley G, Huxtable R, Murtagh M, Ter Meulen R, Flach P, et al. (2017) Smart homes, private homes? An empirical study of technology researchers' perceptions of ethical issues in developing smart-home health technologies. BMC medical ethics 18(1): 1-13.

20. Maria Rosaria Corbo, Antonio Bevilacqua, Leonardo Petruzzi, Francesco Pio Casanova, Milena Sinigaglia (2014) Functional beverages: the emerging side of functional foods: commercial trends, research, and health implications. Comprehensive reviews in food science and food safety 13(6): 1192-1206.

21. Stephen Adeniyi Adefegha (2018) Functional Foods and nutraceuticals as dietary intervention in chronic diseases; novel perspectives for health promotion and disease prevention. J Diet Suppl 5(6): 977-1009.

22. Apell P, Eriksson H (2023) Artificial intelligence (AI) healthcare technology innovations: the current state and challenges from a life science industry perspective. Technology Analysis & Strategic Management 35(2): 179-193.

23. Herland M, Khoshgoftaar TM, Wald R (2014) A review of data mining using big data in health informatics. J Big data 1(1): 1-35.

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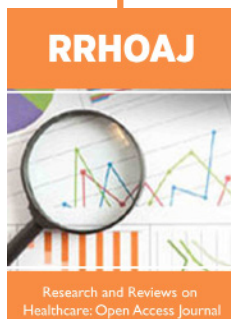
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