



Are we not Losing that Human Touch in Healthcare?

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ARTICLE INFORMATION

Received: January 20, 2018
Revised: January 30, 2018
Accepted: March 15, 2018
Published online: April 02, 2018

ABSTRACT

Technological innovations in healthcare are bringing a huge change in care and delivery system. Technology has improved accessibility as well as affordability in healthcare. But, does this technology provide the humane emotions that improve the patient experience. This article examines the technology role and humane concerns in healthcare and concludes that technology along with humane touch would help the healthcare industry to provide quality of care, on time.

Keywords:

Technology, Innovation, Healthcare

DOI: [10.15415/jnp.2018.42010](https://doi.org/10.15415/jnp.2018.42010)

1. Introduction

Change only is constant. And recently there has been a tremendous change in the healthcare sector due to technological innovations. Today, technology has come a long way in addressing various issues of the healthcare sector. Technology has emerged as device technology (Babusiak & Borik, 2015; Ertola, Figueira, Carlsen, Palaniappan, & Rondini, 2016), software technology-EMR¹/her, HIMS² (Yen, McAlearney, Sieck, Hefner, & Huerta, 2017) Canada, big data analytics (Adrian, 2013; Dimitrov, 2016), biotechnology etc. Definitely, as a service provider, hospitals benefit from the use of technology.

Healthcare is a complex system with its own challenges. India spends below 1.3 percent of GDP on public healthcare which is not sufficient for the second highest populated country in the world. There is a problem of accessibility and affordability due to the shortage of hospitals and primary healthcare centers (Munavalli, Rao, Srinivas & Merode, 2014; Kasthuri, 2018). The geographical terrain creates a lot of challenge in the accessibility of healthcare services in rural areas. The higher medical equipment costs result in expensive care for patients.

Shortage of doctors is a prevalent problem in the Indian healthcare system (Chikersal, 2015; Deo, 2013). According to WHO statistics, India had 1:921 (doctors: patient) in 2017 and the ratio changes to 1:1596 for allopathic doctors. Specialized doctors are even less. In addition, change in the population pyramid will fuel the demand for the healthcare, particularly because of lifestyle diseases (Munavalli et al., 2014).

The innovation in technology has been a boon to healthcare. It has resulted in low-cost devices which added mobility to it would make the healthcare more accessible (Smith et al., 2018; Schuler, 2013; Chen et al., 2019; Markiewicz, Till & MJ, 2014). Accessibility can also be improved with the technological interventions such as telemedicine and low-cost devices. A lot of investments are being made across a range of healthcare technologies with large players stepping into health sector. To list a few innovations would be cognitive computing solutions analyzing diagnostic, clinical and workflow applications. There are a lot of innovative devices like oximeter that is enabled with real-time monitoring (Pandey et al., 2019), injection without needle where the fluid/medicine is propelled at high velocity into skin (Demas & Hunter, 2019), minimal invasive surgeries are possible because of the apt design of the devices. Almost all the specialization of health have smart medical devices and these require exhaustive design process (Tamsin & Bach, 2014).

¹ EMR: Electronic Medical Record

² HIMS: Hospital Information Management System

Healthcare is changing from reactive and hospital-centered to preventive and personalized. The advent of Internet of Things (IoT) have made it possible to achieve personalized and preventive care at the door-step. IoT makes it possible for sensors to collect the required parameters of the patient continuously in real-time, process the data, analyze the data and communicate it to the doctors and patients. This provides continuous monitoring of patients that help them to recover quickly and avoid fatalities (Kodali, Swamy & Boppana, 2015; Dewangan & Mishara, 2018; Jain & Soni, 2017; Bhat, Ahmad, Amin & Ashraf, 2017; Natarajan, Prasath & Kokila, 2016). Additionally, robotics in medical surgeries has paved its way in healthcare sciences and are to date used critically in pharmacy, telehealth etc. Robots have high precision, better dexterity and they are reducing surgeon hand-tremor and assist in spine and joint replacement surgery procedures (Alessandri, Gasparetto, García & Bejar, 2005; Azeta, Bolu, Abioye & Oyawale, 2018; Cresswell, Barley & Sheikh, 2018; Dsouza, Deborah, Samuel and Sunaina. 2016). This sector has a very good potential in healthcare delivery.

Another interesting technology is 3D printing that represents a big opportunity for pharmaceutical and medical companies to create more patient specific treatments, drugs, medical implants surgeries (Dodziuk, 2016; Hurst, 2016). Medical education is improved by creating 3D models that make the students understand the complex physiologies (Abdullah & Reed, 2018). It is also useful for medical imaging like CT-scan, MRI where three dimensional details provide the doctor much more information than 2D images (Yan et al., 2018). Along with this, the augmented reality also plays an important role in healthcare education (Zhu, Hadadgar, Masiello & Zary, 2014). It provides virtual learning experience where the studies on critical diseases can be carried out to see its outcome (Ha & Hong, 2016). This takes healthcare one step more towards personalized and preventive healthcare. Recently, a lot of technologies are appearing that are cost effective (Cipresso, Giglioli, Raya & Riva, 2018). The AI revolution is changing the healthcare sector rapidly, and will likely see continuous change and growth over the next decade (Alessandri et al., 2005; Jiang et al., 2017; Patel et al., 2009). AI is assisting the doctors in clinical decision making in neurology, cardiology, cancer and more (Jiang et al., 2017). Medical diagnostics reasoning and biomedical signal processing is few field of application of machine learning. These require intelligent systems to analyze and machine learning provides significant assistance for the same (Magoulas & Prentza, 2001).

Due to abundance of healthcare data, big data technologies play important role in healthcare (Nevin & PLOS Medicine (Ed.), 2018). The data is utilized for medical informatics: identifying the diseases, patient

logistics, operations management and operations control in hospitals. With the availability of real-time data and applying various machine learning and swarm intelligence planning, scheduling and coordination have been performed efficiently (Munavalli, Rao, Srinivas, Manjunath, & Merode, 2017; Munavalli, Rao, Srinivasan, & Merode, 2019; Ahmed & Glasgow, 2012; Jemal, Kechaou & Ayed, 2014). The healthcare domain is has massive influx of multimodality data, the role of health informatics has grown rapidly. It's a challenging task as healthcare is characterized by variety, uncertainty and complex (Jemal et al., 2014). Deep learning, a technique with its foundation in artificial neural networks, is emerging in recent years as a powerful tool for machine learning, promising to reshape the future of artificial intelligence (Magoulas & Prentza, 2001; Jemal, Kechaou, Alimi & Ayed, 2015). Practically, though the data was collected in hospitals, it was not maintained and used effectively as it has been put to use now. The data analytics improves the performances and efficiency of hospitals. In addition to this we have variety of mobile Apps that would predict and reduce the time spent by patients in hospitals (Munavalli et al., 2017).

Nevertheless, care providers also face a number of hurdles when integrating these technologies into their practice. But, these technologies have come a long way to service healthcare sector.

2. Discussion and Conclusion

However, while these advancements offer exciting solutions, are we not missing the aspect of care delivery that is valued by patients and caregivers alike: the humane touch? For patients, the idea of robot giving treatment might be disturbing. Can the technology understand us as individuals, the way the doctor does? What about the patient experience and trust. Factors that contribute to patient experience are punctuality of doctors and nurses, empathy or compassion, culture (employees driven by its vision and mission has a good work culture). Can a patient trust a machine rather than a doctor? As patients, we still need assurance that will comfort the patients emotionally.

Care providers need to recognize and protect the importance of the humane experience while embracing the potential of technology. Hospitals should be working to better understand the optimal balance between hands-on staff and technology, and applying the growing range of technology solutions to enhance the patient-provider experience, not to displace it. The hospital management should not only train their staff for technological interventions but also train them in handling patients' emotions by being compassionate.

The development of new technology and cheaper solutions in the everyday operations of hospitals should

provide an additional layer of decision support for physicians to diagnose and treat patients, more quickly and accurately. It should be remembered that rather than acting as the sole decision-maker, technologies will be another tool for doctors and nurses, running through lists of symptoms and conditions far faster than a human could and displaying these “decisions” for the care provider to review. Doctors need to work collaboratively with the new technology, and blend the information offered with their own clinical knowledge and experience to make a final determination. In this way, the patient centric care and doctor-patient relationship is maintained, while improving the quality of care. The healthcare delivery system should incorporate both the technological perspective along with humane perspective as shown in the Figure 1.

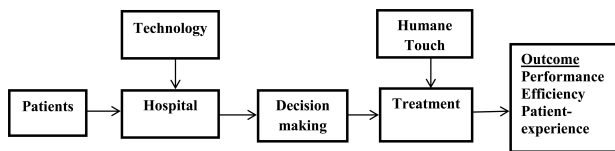


Figure 1: Integrated Healthcare delivery system

We as patients readily trust digital technology to give us facts and information, but when we seek comfort or reassurance, we reach for the humane touch. Therefore, hospitals have to learn the art of balancing technological interaction with humane touch. In doing so, doctors and nurses are to be relieved of the coordination tasks, allowing them to focus on the aspects of their work that require (or are best suited to) a humane touch. That means more time interacting with patients.

Remember, humane touch is a part of healthcare delivery system. Innovative technology is very much needed to improve accessibility, affordability and efficiency. But, healthcare is incomplete without humane touch. The need of the hour is “Preserving Humane Touch in a technological world”

About the author

Dr. Jyoti R Munavalli is working as an Associate Professor in BNM Institute of Technology, Bangalore. She has completed her B.E., in Electronics and Communication Engineering, M.Tech in Digital Electronics and Communication and her Ph.D. in Real-time scheduling in outpatient clinics, from Maastricht University, Netherlands. Her research involved optimizing the operations –planning, scheduling and control of resources and patients. During her research she has worked with Aravind Eye hospital, Madurai. She has also worked with Institute of Health Management and Research (IHMR-B), Bangalore. Her research interests are hospital management, operations research, artificial intelligence, data analytics and healthcare technology.

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