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Application of Healthcare Information Technology in surveillance, prevention and treatment of cardiovascular diseases- A Short Communication

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Abstract:
Digital health services in recent times furnish health education, awareness, monitoring of vital signs, disease prediction and also can be used as diagnostic tools, primarily through machine learning and deep learning applications. These big datasets acquired through digital health lay out the disease trends, patient health insights and act as a better predictor of future health outcomes. Cardiovascular diseases (CVD) outcomes have been seen to have decreased significantly with application of digital health outcomes in Western countries.

The deaths from CVD in India have risen from 2.26 million in 1990 to 4.77 million in 2020. Using digital technologies to promote healthy lifestyle changes embracing healthy behaviors can support early diagnosis, effective management and appropriate clinical decisions. This focus if adopted in India can bring dynamic changes in the CVD health scenario essentially tackling the burden of cardiovascular diseases.

Key words: cardiovascular diseases, digital technologies, diagnostic tool, information technology, innovation.

Communication

The cardiovascular disease is a leading cause of death among all racial and ethnic groups in most countries (Labarthe, 1998), the United States included (WHO, 1985; Blank, 1997). The disease is characterized by malfunction conditions like hypertension, stroke, atherosclerosis, hypertensive renal disease and vascular disease among other heart diseases (AHA, 1980; Scherff& Boyd, 1958). Experts have integrated the use of information technology in an attempt to curb the effect of heart-related diseases. These efforts span from disease diagnosis, treatment and prevention. This has led to their adopting of several approaches in order to contain the disease, including the collaborative healthcare approach (Becker et al, 2005).

Collaborative healthcare is the application of information technology so as to promote decision making and information relay between the physician, patients and their families. Collaborative healthcare assists patients in understanding their medical conditions and the effects of their values in decision making during treatment. This helps in enhancing a better relationship for the healthcare system.

Collaborative healthcare has improved both care management and patient care, as both patients and their families are fully engaged in healthcare. Through it, decisions concerning the patient are made on his personal preference after a thorough guidance, counseling and full update on his medical condition. This active participation enhances the patient's trust and confidence in the provider, thereby enhancing the efficiency of the healthcare system in dealing with cardiovascular diseases.

Information technology enhances accessibility of information for all the stakeholders. It also enhances the distribution of information and skills to the physicians throughout the system. Generally, collaborative healthcare has improved healthcare quality through its connectivity. Through collaborative healthcare, clinical services are improved and client satisfaction is realized. It builds on interactive health communication by providing a technical infrastructure for an effective and efficient partnership between the provider and a patient. This minimizes the burden of the illness, and optimizes the relationships among the various stakeholders. Information technology enhances the healthcare system through low costs, improved quality and better client satisfaction. For instance, Internet can be used to reduce delivery time and costs incurred during healthcare.

Data collection through Internet helps in developing patient reports in a timely and cost-efficient manner. It also enhances improved quality compared to the convectional and traditional ways of data collection. Through improved information technology, patients are able to effectively control symptoms related to cardiovascular diseases. They are able to share information with those who are already victims as well as those affected. This will enable them to cope with the disease at an early stage (Wong et al, 2005). It also assists in the management of side effects that accompany drug usage. This is possible through information and knowledge sharing over the internet, cell phones and other means of information dissemination. Patients and their families can efficiently and effectively use information technology in dealing with cardiovascular effects at home. This therefore provides healthcare facilities to the patient without necessarily visiting hospital. It helps in reducing the mortality rate, as many people are able to cope with the disease both at home and in hospitals. This enhances people's response to such diseases (Taylor et al, 1994).

Through integrated information systems, physicians and patients are able to closely monitor the therapeutic progress and respond accordingly without any delays. Discussion regarding the way forward can be done in real- time over long distance without the need to travel. This reduces operation costs in dealing with the disease (Scherf& Boyd, 1958).

Technology assists doctors in the early diagnosis and detection of sentry symptoms (Tierney et al, 2002). This provides them with a humble time in responding to the disease. It also helps them in the prescription of the right drugs that would suppress or effectively deal with the disease. It enables physicians to deliver the right intervention at the right time, without gratuitous delays.

During medication, information technology assists in prescription; it ensures that patients adhere to the prescription details through constant communication with their doctors on how to use the drugs appropriately. Regular and constant communication greatly reduces the doctor's workload.

Information technology ensures that any partnership towards the disease's control and prevention succeeds (Foody, 2001). This prevents delays such as the arrival and development of

patient reports and reviews. This information is readily available in computerized form and assists doctors to quickly review the medical background of their patient, such as his family cardiovascular disease history, related complication in the patients own background and his medical records on missed drugs and medications. These are essential pointers to doctors and nurses in an attempt to treat a patient, as they provide useful information to the providers and all the stakeholders (Becker et al, 2005).

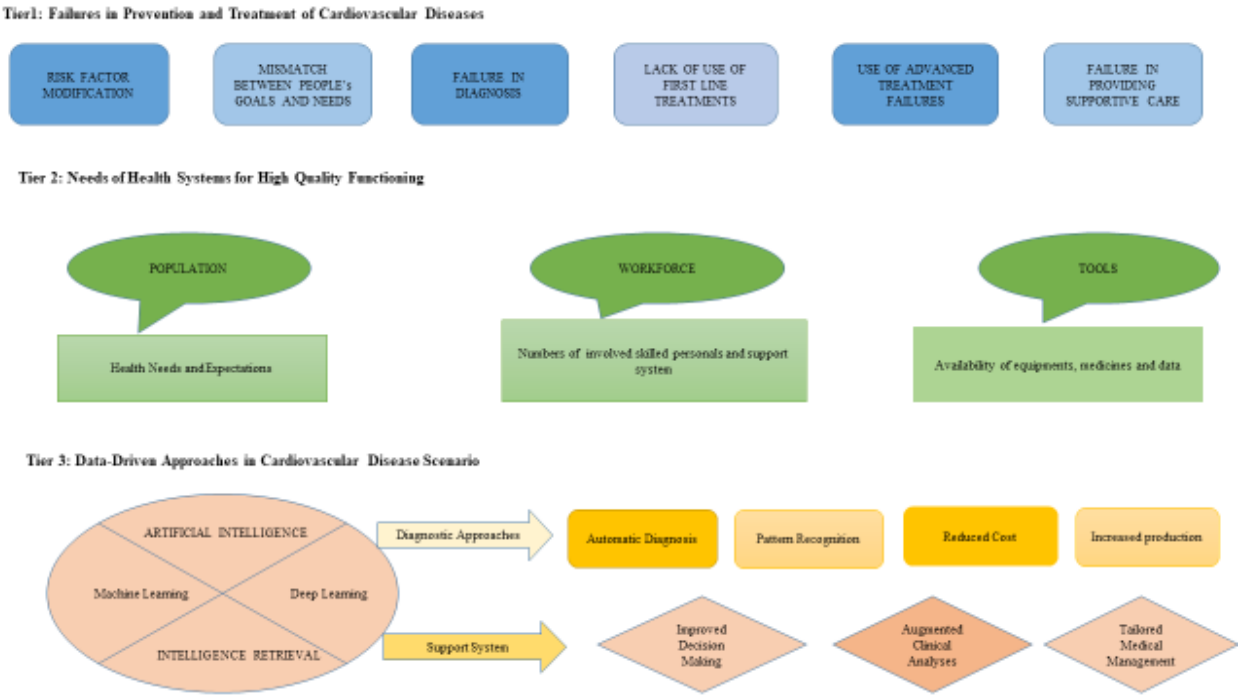

Figure 1: Evolution of Data Driven Technologies in Surveillance, Prevention and Treatment of Cardiovascular Diseases

Conclusion

Information technology can ease the information recovery process and information usage. This can greatly assist in the patient's healing process, through the use of database management systems and other computer packages. This storage ensures that minimal time is taken in processing and distribution of the information to other departments for usage in treatment of a patient (Taylor et al, 1994).

In a country like India (middle income developing country) cardiovascular diseases affect people from both urban and rural areas but disproportionate economic status in the rural areas lead to adverse outcomes. Cost-effective interventions for prevention and treatment of CVD diseases are readily available to the population residing in the urban areas but in the remote and poor rural areas the advanced treatments are not readily available due to inadequate use of evidence-based arbitration and low adherence rates.

It has been observed that India constitutes an epidemiological passage where patients thrive longer with major risk factors of cardiovascular diseases. (Nallamothu BK, 2013)

A compelling need is to improve in the technological innovations which will be low-cost but high impact with a culture friendly approach building a relationship of trust among the health care workers and identified high risk patients. (Jafar TH et al., 2009, Allen JK et al. 2011), thereby supporting the clinical decision –making. Advanced technology-based research methods for delivering efficient yet culturally coordinated treatments through will improve the diagnosis and treatment of CVDs in combating the major mortality and morbidity due to CVD in India.

Conflicts of interest

The author declares no conflict of interest

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