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Assessing the Impact of Health Technology on the Efficiency of Medical Care

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ABSTRACT

Background: Technology breakthroughs are changing the way that healthcare is provided. The effectiveness and ease of use of healthcare have greatly increased with the use of various health technologies. Adoption of health technology can also significantly enhance efficaciousness and enhance health outcomes of public and private healthcare spending. It is unclear, therefore, how health technology will change healthcare delivery and increase cost effectiveness. the function of new technology in providing healthcare services that enhance patient outcomes, increase healthcare provider productivity, and lower patient costs.

Aim: to comprehend the ways in which health technologies impact healthcare delivery overall, resource allocation, and patient outcomes.

Objective: Evaluating how health technology affects the effectiveness of medical care. the function of new technology in providing healthcare services that enhance patient outcomes, increase healthcare provider productivity, and lower patient costs.

conclusions: It has been demonstrated that using technology to deliver healthcare services can improve patient outcomes, increase productivity in the medical field, and lower total healthcare expenditures. However, there are two key challenges that must be resolved before these technologies are put into use: equity and reimbursement.

KEYWORDS: Health, Technology, Information, Telemedicine.

1. Introduction

Every individual is entitled to the necessary medical treatment and interventions to support a healthy lifestyle. The way that healthcare is provided varies greatly throughout nations, particularly in light of the existence of diverse insurance and

healthcare systems. More developed economies with more resources tend to have higher levels of health and well-being. Global healthcare trends are changing. It's getting more and more clear that innovative approaches to care delivery are necessary in order to provide high-quality, reasonably priced healthcare. New technology use is a possible approach to address present issues and advance pharmacy and healthcare practices [1].

The definition of "technology" is the "dynamic grouping of techniques, methods, skills, and procedures involved in the attainment of desired outcomes that deliver benefits for consumers or in the production of goods or services." The delivery of healthcare is being impacted by new technology. " The use of structured knowledge and abilities to the creation of tools, medications, vaccinations, protocols, and systems intended to enhance quality of life and address health issues" is how the World Health Organization defines health technology [1].

New healthcare solutions are emerging thanks to the internet, enhancing patient and provider communication and information sharing. Web-based electronic communications, such e-mail, e-commerce, e-prescribing, e-health, etc., are becoming more prevalent in all areas of society. There are rising new technologies as well. As information and communication technology (ICT) in health, electronic gadgets, wireless, telecommunications, and audio-visual systems are continuously being created. E-health is the use of the internet and online technologies in the field of health [1].

Regarding the system's ability to support itself financially, the health care industry faces significant obstacles. How to attain and sustain affordable, high-quality healthcare is decided. To guarantee that the correct care is provided to the right person at the right time, a thorough evaluation of the effects of both new and current healthcare practices on pertinent outcomes is necessary. The term "impact" describes the (un)intentional impacts that healthcare practices have on a range of health and care outcomes, including cost, effectiveness, safety, and other treatment-related factors. Assessment of health technology emerged as a field in the 1980s, generating and compiling data regarding the effectiveness and efficiency of primarily pharmacological advancements [2].

Patient viewpoints, organizational characteristics, and other societal factors have been added to the methodological and conceptual assessment of clinical results and medication cost-effectiveness by HTA over time. Simultaneously, the use of technology in healthcare has gradually shifted from a biological focus to a more holistic strategy that incorporates robots, digital healthcare solutions, and medical gadgets like imaging tools [2].

All facets of our civilization have developed and evolved significantly as a result of technology. It has always been entwined with human evolution, even with little advancements in the economy or society. Web services and information communication technology (ICT) have a significant influence on people's lifestyles and the quality of services provided. One of the areas of healthcare that is expanding the fastest right now is eHealth, or the use of ICT to the health sector. It has opened up a new field of study for physicians, scientists, and researchers who aim to create precise and effective technology to address health issues, while policymakers

consider the issue from the perspective of offering everyone access to inexpensive healthcare [3].

Additionally, it fosters curiosity and knowledge transfer among regular people. ICT should be used appropriately to bridge the digital and health gaps in order to attain national and global health. New applications for sharing healthcare information with a variety of audiences through creative, interoperable design are made possible by technical advancements. These applications are straightforward, user-friendly, entertaining, and able to provide a variety of users with relevant information for basic healthcare [3].

Information technology (IT) advancements have changed how clients and service providers interact in a variety of professional service contexts, including banks, hotels, and law firms. Health Information Technology (HIT) presents a viable approach to effectively enhance both experience quality and conformity [4].

2. Literature review

Significant changes are occurring in the fields of medicine, health care, and the broader social meaning and administration of health. This is partly due to advances in science and technology, which open up new avenues for medical diagnosis, care, and administration. It also represents shifts in the responsibility for health and the location of care. Our understanding of the body, health, and disease is being redefined by genomics, computer science, imaging, and cutting-edge integrated technologies like nanotechnology [5].

Precision medicine is a medical model that is more personalized to individual patients and subgroups thanks to recent technological advancements. In general, this procedure entails customizing elements of the patient pathway (such as counsel, referral, or therapy) according to the patient's prognosis, likelihood of responding to treatment, or risk of disease. Patients and the larger healthcare system may gain more from this approach. The "precision" is determined by instruments, such as risk equations and genetic testing, that take into account genetic, environmental, and lifestyle data [6].

It is anticipated that precision medicine will continue to advance technologically, led by initiatives like the 100,000 Genomes Project and the Precision Medicine Initiative. The creation of new infrastructure for molecular testing and "learning" health information systems that examine molecular and medical record data to inform treatment, detection, and prevention plans in the future are two examples of how this innovation is expected to alter the structure and provision of healthcare service [6].

Businesses believe that the only way to beat the competition is to increase productivity, profitability, and operational quality—all of which can be attained by investing in information technology and high-quality data. With time, the health care industry changes in many ways. Thanks to connectivity, it has become more efficient and enhanced the patient experience. Adopting health information technology (HIT) has the potential to reduce medical errors, lower medication events, improve doctor-

patient relationships, and save billions of dollars, according to a number of academics. Additionally, it can reduce operating expenses and raise the standard of medical procedures [7].

Effective HIT is seen by healthcare officials as a response to issues with growing expenses, medical mistakes, and subpar service. Numerous studies have been conducted on the advantages of HIT in the healthcare sector, but they have neglected to consider the effect that actual IT use has on organizational performance. This essay will go over how public education hospital performance is affected by the quality of health information and health technology use. The anticipated outcome of this study will motivate Jordan's and developing nations' healthcare systems to increase their investments in HIT and high-quality health information [7].

Figure 1. The Role of Technology in Healthcare [17].

Globally, technology is becoming more and more incorporated into healthcare systems as it develops. Technology is changing the way healthcare is provided, from wearables that track vital signs to telemedicine that enables patients to communicate with medical professionals from a distance. This essay will examine the function of technology in healthcare, its advantages and disadvantages, and how it is enhancing patient care [17].

Digital healthcare

Digital health is transforming the way that health systems operate. It is opening up new treatment options, changing the power relationships between patients and clinicians, and shifting the focus of health systems in low- and middle-income countries to client-centered care. Although many of these changes are just now becoming apparent because of resistance from institutions and individuals that don't want to alter the status quo, these changes are unavoidable owing to the rapidly expanding global use of digital technology [8].

The World Health Organization is now creating a set of guidelines for the use of digital technology across all nations, having recently documented at least 12 uses for it in the field of health. These responsibilities include, in short, giving everyone access to clearer and more precise information about health and illness; providing accurate and searchable records of births, deaths, and medical encounters; helping medical professionals and managers directly with patient diagnosis and treatment; and providing operational and strategic data about drug availability, budgets, and human resource management to health managers at all levels. The delivery of healthcare will be profoundly altered by impacts on these processes in ways that we do not completely comprehend, but disruption is undoubtedly coming [8].

Digital health has facilitated the accessibility of various technologies, such as smartphone-connected ECG and genome sequencing, but it also poses a risk of dehumanizing healthcare. The authors contend that improved health outcomes from the use of technology are contingent upon recognition of the associated cultural issues and satisfaction of patients' evolving requirements. Disruptive innovations like VR, deep learning algorithms, and health sensors can thus support value-based healthcare by enabling human skills like creative problem-solving, clinical judgement, and experience to determine the effectiveness of the doctor-patient interaction and interventions. With patients now at the point of care thanks to digital health, a new status quo and new roles for patients and carers are emerging [9].

"Digital health encompasses a range of intersecting domains, including artificial intelligence, big data analysis, telehealth, electronic health, and the internet of things." The healthcare industry's technology (r)evolution is claimed to possess the capacity to "support the provision of effective and efficient health care services" and maintain stable costs for healthcare delivery. Additionally, even for populations who are difficult to reach, precision, personalized, and holistic medicine may be made possible by the digitization of health delivery. Wearable technology and mobile health apps may be particularly important for the digitalization of medicine in addition to a wide range of other technologies. This is due to the growing market for wearable (medical) gadgets, which has the power to fundamentally change the way the healthcare system operates today. These wearables "are already revolutionising biomedicine through mobile and digital health," in particular by enabling continuous, longitudinal health monitoring outside of the clinic [10].

Telemedicine and patient self-measurements

Numerous research have shown significant findings about telemedicine and mHealth in a range of patient populations. Text messaging and smartphone apps are two low-cost, widely-available interventions that have been shown to be effective in improving medication adherence, encouraging patients to quit smoking, preventing diabetes in at-risk individuals, and improving the prognosis of patients with coronary heart disease. Self-measurements using mobile health devices have been linked to better glycemic management and blood pressure [11].

Over the past ten years, a large number of studies have been carried out to assess mobile health in patients with cardiac disease, specifically HF. The design of telemedicine studies that remotely monitor several physiological data, such as blood pressure, weight, and heart rate, has been made possible by advancements in devices

throughout this time. When compared to standard therapy and planned patient follow-up, the existing body of clinical trial data has mainly shown the positive effects of telemedicine in HF, including increased survival and decreased HF-related hospitalization [11].

The efficacy of telemedicine and the identification of patients who are eligible for device-based self-care depend on the matching of patients with digital technology. In these situations, the right technology is chosen based on the intended result, such as controlling blood pressure or glucose, losing weight, or lowering hospital readmissions [11].

Health Information Technology

Health information technology (HIT) is the term used to describe the hardware, software, and systems that are used in the healthcare business to gather, transmit, use, extract, and analyse data. The technology's end users include not only patients, physicians, and other front-line healthcare providers, but also insurance companies, public health organisations, regulatory and quality assurance bodies, pharmaceutical and medical device companies, and various governmental levels. The delivery and advancement of healthcare at the societal level depend heavily on the technology and systems that enable Health Information Technology (HIT) because these entities have a wide range of duties and various expectations and objectives [12].

The idea that health information technology (HIT) may enhance patient and population health outcomes, healthcare delivery efficiencies, and accountability while supporting the continuous endeavor to reduce healthcare costs was the driving force behind the creation of HIT [12].

Health information technology (HIT) holds the potential to improve healthcare systems' efficacy, efficiency, and safety. Healthcare information technology (HIT), which includes electronic health records (EHRs), has the potential to enhance patient care by decreasing avoidable errors, supporting clinicians in making clinical decisions, and facilitating quick communication between team members. In actuality, there are a plethora of obstacles associated with implementing HIT. Certain of these difficulties are expected (keeping clinical operations safe and efficient while switching record systems, for example) [13].

The notion that new technologies are the agents of change and that it is the duty of individuals and institutions to adjust to them is implicit in certain methods of implementing HIT. Socio-technical methods, on the other hand, assert that the presence or influence of technology is inextricably linked to the social and organizational environments in which they function. These methods have become popular in information systems and organizational development research, and they have lately been used especially in the study of HIT [13].

Electronic health records

Because these organisations have a wide range of responsibilities as well as different expectations and aims, the delivery and improvement of healthcare at the societal level greatly depend on the technology and processes that enable Health Information Technology (HIT). To counteract these inclinations, there is a lot of interest in using

electronic health records. For observational research, embedded pragmatic or post-marketing registry-based randomised studies, or comparative effectiveness studies in their early applications, electronic health records are meant to serve as the primary source of data [14].

Figure 2. Electronic Health Records have truly transformed Medical Transcription [18].

Electronic health records may be used to speed up baseline and follow-up data collection, help with patient recruitment, and evaluate the viability of studies. Using electronic health records in clinical research presents a number of obstacles, including protecting patient privacy and security, resolving issues with integrating disparate systems, and sustaining infrastructure for high-quality data reuse [14].

Artificial intelligence

Artificial intelligence (AI) has the power to completely change the way that healthcare is provided. In collaboration with EIT Health of the European Union, a joint report examines how it might help enhance patient experience, care results, and access to healthcare services. It can increase productivity and the effectiveness of care delivery, allowing healthcare organisations to treat more patients with higher-quality treatment. AI can improve the experience of healthcare providers by reducing burnout and enabling them to spend more time directly caring for patients [15].

Artificial intelligence (AI), which can also assist with some of the aforementioned problems, has the potential to revolutionise the healthcare industry. There are various definitions of artificial intelligence (AI), however the definition used in this study is derived from the European Parliament and is clear and useful: AI is the ability of a computer program to carry out tasks or reasoning processes that we typically identify with intelligence in a human person. AI has the ability to improve patient outcomes

and boost the productivity and efficiency of healthcare delivery. It can also improve the lives of medical personnel by enabling them to spend more time caring for patients, which will raise morale and promote retention. It may potentially hasten the delivery of life-saving medications [15].

Role of Internet

The Internet of Things (IoT) develops into a highly dispersed, heterogeneous structure that can adapt to the demands of many organizations and individuals on a regular basis. Public health monitoring, effective oversight of centralized management, and low-cost health services and their support are all made possible by the rapid growth of IT-based technologies like cloud computing and the Internet of Things. As a result, the integration of IoT with health care has drawn more interest from academic and corporate circles [16].

3. Conclusion

Every year, the burden of chronic illness increases, and the associated expenses rise dramatically. By offering interventions that can help patients manage their chronic diseases or improve their health, technology-enabled healthcare delivery could assist reduce some of the expenses associated with poor health and consequently lower morbidity and mortality. Any form of care or assistance for the patient must be provided at the medical facility under the current healthcare system. When technology is used to offer care, the patient is brought to the care rather than the other way around. To achieve meaningful improvements in health outcomes, productivity, and cost savings before using these technologies, we think that two key issues—reimbursement and equity—need to be resolved.

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