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The Impact of Digital Health on Reducing Healthcare Costs

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ABSTRACT

Digital health technologies, encompassing telemedicine and health information technology (HIT), have demonstrated the potential to reduce healthcare costs while improving accessibility and care quality. With healthcare costs rising globally, digital tools offer a promising solution by enabling early diagnosis, remote monitoring, and streamlined care coordination. Telemedicine facilitates access to medical services, especially in underserved areas, while HIT, particularly through electronic health records (EHR), enhances care efficiency and reduces unnecessary procedures. Despite the benefits, challenges such as resistance to technology, integration difficulties, and disparities in access must be addressed to realize the full cost-saving potential of digital health. This paper explores the impact of digital health on reducing healthcare expenditures and presents case studies that highlight the technology's success in improving care outcomes and controlling costs.

Keywords: Digital health, Telemedicine, Health information technology (HIT), Electronic health records (EHR), Healthcare cost reduction.

INTRODUCTION

The high cost of healthcare is a global issue. People are spending more on medical bills, making it difficult to keep up. Countries with government-funded healthcare are renegotiating plans and cutting programs to maintain budgets. In America, people struggle to pay medical bills and navigate the complicated world of healthcare. However, there is an overlooked solution a new technology that allows for monitoring health through digital means. This addresses the problem of rising healthcare costs [1]. There are simple health issues that often go unnoticed before they become bigger problems. Identifying and addressing these issues early on can significantly improve outcomes, and this can be achieved through making necessary lifestyle changes. It is well-established that prevention is better than a cure, and in this regard, digital monitoring plays a crucial role. By harnessing the power of technology, individuals can track their health status and receive real-time updates, enabling them to take proactive measures. However, to truly revolutionize healthcare, there is a pressing need for a highly efficient and readily accessible mass-produced device that consolidates all monitoring capabilities. This all-in-one solution would empower individuals to conveniently monitor various aspects of their health, facilitating timely intervention and personalization of care [2].

Overview of Digital Health Technologies

Digital health technologies can be grouped into two major categories: telemedicine and health information technology (HIT). Telemedicine encompasses a variety of applications and services using two-way video, email, smartphones, wireless tools, and other forms of telecommunication's technology and health care services. Examples of telemedicine are digital stethoscopes, store-and-forward telemedicine, remote monitoring, online health management, and tele-education (health professional training). HIT supports the collection, storage, exchange, and analysis of health data using technology. HIT includes electronic health records (EHR), health information exchange (HIE), personal health records (PHR), and population health management. The most common form of HIT is an EHR. Both telemedicine and HIT can offer a more coordinated system of care that permits real-time access to patient information and the sharing of that information among providers. Technologies such as EHRs and secure messaging can reduce unnecessary tests and procedures, and the need for unnecessary hospital admissions, potentially leading to a reduction in overall expenditures. Policy-makers require new ways to measure the impact of digital health technologies on costs to see if they can reduce healthcare spending as hypothesized by many estimates. Before the implementation of EHRs and other health information

technologies, health care accounted for approximately 21.8% of GDP, in 2008 rising to approximately 24% by 2025. On the other hand, the Department of Health and Human Services promotes telemedicine in the hope that it would reduce the costs of providing care to rural patients, as there are concerns about the rising costs of Medicare. Medicare providers are paid through FFS, which incentivizes not only unneeded tests but also adds to healthcare spending significantly [3].

Telemedicine

Telemedicine is the use of technology to provide healthcare services and exchange information. It can be done through various modalities, including video/audio, telephone, and text-based platforms. Telemedicine is used for a variety of services, including acute and chronic care, follow-up encounters, and urgent care. It has expanded due to improved technology, reimbursement, lower costs, consumer demand, provider incentives, and private investments. During the COVID-19 pandemic, telemedicine saw a significant increase in usage and was preferred by many patients even after the pandemic. [4]. Given the precipitous and widespread adoption of telemedicine, questions about its comparative cost may be relevant to payers, policymakers, policymakers, providers, and consumers. Three specific questions can be addressed: (i) How might telemedicine impact total healthcare costs? (ii) How does the cost impact of telemedicine differ by specialty and type of visit (new versus follow-up)? and (iii) How does the cost impact of telemedicine differ by the location of the telemedicine service (urban, rural, or frontier)? [5].

Health Information Technology

Health information technology (HIT) is termed broadly to incorporate hardware and software tools that promote the systematic use of EHRs in clinical practice. HIT is sometimes used to refer solely to software applications used to create, access, and retrieve EHRs. According to the Office of the National Coordinator for Health Information Technology (ONC), HIT encompasses technology used to store, share, and analyze health information. This includes the infrastructure that supports the EHR, including the following computer hardware and software applications: core clinical and administrative EHR applications, clinical decision support systems, electronic prescribing, health information exchanges, patient portal systems, and telehealth and remote patient monitoring systems. HIT also incorporates computer networks, servers, and network security technology [6]. HIT is critical for EHRs. EHRs are software applications for storing health information. They include the infrastructure supporting computer-based record systems. Electronic health records must contain digital information. The adoption of HIT has been driven by federal initiatives to improve healthcare. Studies show that investing in HIT can generate significant savings for the healthcare system. Reliance on paper-based records leads to efficiency losses and high administrative costs [7].

Benefits Of Digital Health in Reducing Healthcare Costs

Digital health is a game-changer in healthcare, improving outcomes and cost-effectiveness. However, there is a lack of analysis on the transition to a digital health world. The focus is on its impact on healthcare costs and monetization strategies. Digital health covers various technologies, including mHealth, wearables, telehealth, and decision support tools. These technologies analyze health and non-health data to reduce chronic diseases [8]. A revealed preference approach is used to determine which mHealth technologies can create savings in healthcare costs and to what extent. The results are then extended by modeling how mHealth technologies would affect the overall health and healthcare costs in the population. While some of the analyses done are new, the incredibly simple models used are still too basic to be of any major help for companies interested in engaging in digital health. Nevertheless, the focus on costs and savings should be of interest to companies working in digital health [9].

Challenges and Barriers to Implementation

The healthcare sector is transitioning to digital solutions, which presents challenges such as technological issues, resistance to new technology, lack of educational resources, and difficulties in integration. Performance comparison and data management are key considerations during this transition. Technical issues may arise, requiring proactive strategies to overcome them. By addressing these challenges, the healthcare sector can unlock the full potential of digital solutions [10]. The comprehension of new technologies differs significantly among potential users. Different generations or age groups of users understand the same technology very differently. For instance, students studying medicine understand health-related digital technologies in much larger detail than older generations. Accordingly, some groups might respond insufficiently to certain implementations, as the preferences of technology might strictly depend on age. The difference in preferences impairs the successful implementation of technologies designed for particular user groups. Moreover, some of the potential users build up a negative approach towards technology usage. Findings from multiple research papers reveal that if a particular technology must be used, even though desired otherwise, negative attitudes are highly probable. These prejudices harm the technology adoption process as they slow down adjusting to a new

system and directly oppositely influence performance. Without motivation and willingness to use, technology adoption often results in only wasted investment [11].

Case Studies and Success Stories

Telemedicine in Rural America Successfully Reduces Costs and Expands Access: The State of Alaska Telemedicine, or the use of technology to provide remote healthcare services, has been proven to reduce healthcare costs while improving access and quality of care. In 2017, the State of Alaska established telehealth services for state-funded mental health medication management and therapy services, aiming to increase access to care, improve client outcomes, and reduce costs. A retrospective analysis of state-funded clients revealed that telepsychiatry clients were more likely to complete at least one face-to-face session, maintained comparable or lower total costs, and demonstrated equal improvements in mental health functioning when compared to non-telepsychiatry clients. Advancing Telehealth in Washington State: Lessons Learned from COVID-19: The State of Washington Washington State's Department of Health conducted an analysis assessing the impact of COVID-19 on telehealth delivery and using telehealth to address social determinants of health (SDOH). In 2020, telehealth visits increased dramatically, but 14% of the population remained unserved, with persistent inequities. Although audio-only telehealth visits increased, it is unclear if telehealth for SDOH-related health equity adaptations is widespread or associated with quality of care. Recommended steps included developing sustainable financing practices, expanding broadband access, developing robust training and technical assistance, and creating a state repository of telehealth best practices. Reducing Healthcare Costs and Readmissions with Remote Health Monitoring and Telehealth: Phillips Research A federal-funded study by Phillips Research found that Remote Health Monitoring and Telehealth provided by telehealth suppliers reduced readmissions by 55% among Medicare beneficiaries with chronic diseases, 47% in states submitting 10% or more hospitals for the EHR pilot program, and an overall 33% reduction in preventable hospitalizations. In 2016, bills were passed in several states to cover these telehealth visits just as they cover in-person visits for both public and private insurance plans. Research showed that Remote Health Monitoring increased compliance with optimal care processes among more than half (53%) of the total population having heart failure than would have been the case without it. The overall gain was 24% at the second measurement moment. Telehealth Community of Practice Addresses Healthcare Disparities in Rural Kentucky: The University of Kentucky: University of Kentucky the Telehealth Community of Practice (TCOP) was created in 2010 by the Kentucky Telehealth Network and became a USDA grant-funded initiative in 2019. A grant from the United States Department of Agriculture was awarded to the University of Kentucky in 2019 to fund the program for 48 Kentuckians. Despite being a health professional shortage area, ensuring healthcare access for low-income Kentuckians proved difficult. TCOP's goals included supporting healthcare access through telehealth services and addressing health disparities [12, 13].

CONCLUSION

Digital health technologies provide a disruptive way to address rising healthcare expenditures. Telemedicine and HIT offer realistic options for decreasing wasteful spending and increasing patient outcomes by encouraging early intervention, remote care, and increased efficiency in health information administration. However, the effectiveness of these technologies is dependent on overcoming constraints such as adoption resistance, integration issues, and disparities in access among communities. Strategic efforts to increase digital health adoption, particularly in rural and underserved areas, might have a significant impact on transforming the healthcare environment, resulting in long-term cost savings and improved health outcomes.

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